INTERNATIONAL MARITIME ORGANIZATION

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REPORT OF THE MARINE ENVIRONMENT PROTECTION COMMITTEE ON ITS EIGHTY-FIRST SESSION

Attached are the annexes to the report of the Marine Environment Protection Committee on its eighty-first session (MEPC 81/16).

LIST OF ANNEXES

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ANNEX 1

RESOLUTION MEPC.383(81)
(adopted on 22 March 2024)

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE CONTROL AND MANAGEMENT OF SHIPS' BALLAST WATER AND SEDIMENTS, 2004

Amendments to regulations A-1 and B-2

(Use of electronic record books)

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 article 19 of the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (the BWM Convention), which specifies the amendment procedure and confers upon the Marine Environment Protection Committee of the Organization the function of considering amendments thereto for adoption by the Parties,

HAVING CONSIDERED, at its eightieth session, proposed amendments to appendix II of the BWM Convention regarding the form of Ballast Water Record Book,

1 ADOPTS, in accordance with article 19(2)(c) of the BWM Convention, amendments to appendix II, the text of which is set out in the annex to the present resolution;

2 DETERMINES, in accordance with article 19(2)(e)(ii) of the BWM Convention, that the amendments shall be deemed to have been accepted on 1 April 2025 unless, prior to that date, more than one third of the Parties have notified the Secretary-General that they object to the amendments;

3 INVITES the Parties to note that, in accordance with article 19(2)(f)(ii) of the BWM Convention, the said amendments shall enter into force on 1October 2025 upon their acceptance in accordance with paragraph 2 above;

4 REQUESTS the Secretary-General, for the purposes of article 19(2)(d) of the BWM Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Parties to the BWM Convention;

5 ALSO REQUESTS the Secretary-General to transmit copies of the present resolution and its annex to Members of the Organization which are not Parties to the BWM Convention;

6 FURTHER REQUESTS the Secretary-General to prepare a consolidated certified text of the BWM Convention.

ANNEX

DRAFT AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE CONTROL AND MANAGEMENT OF SHIPS' BALLAST WATER AND SEDIMENTS

(Use of electronic record books)

Regulation A-1
Definitions

1 A new paragraph 9 is inserted after existing paragraph 8, as follows:

"9 Electronic record book means a device or system, approved by the Administration, used to electronically record the entries for each ballast water operation as required under this Convention in lieu of a hard copy record book."

Regulation B-2
Ballast Water Record Book

2 Paragraph 1 is replaced by the following:

"1 Each ship shall have on board a Ballast Water Record Book, that may be an electronic record book, or that may be integrated into another record book or system, and which shall at least contain the information specified in appendix II. Electronic record books shall be approved by the Administration taking into account the guidelines developed by the Organization*."

3 Paragraph 5 is replaced by the following:

"5 Each operation concerning ballast water shall be fully recorded without delay in the Ballast Water Record Book. Each entry shall be signed by the officer in charge of the operation concerned and each completed page shall be signed by the master or, in the case of a group of electronic entries, shall be verified by the master in a timely manner. The entries in the Ballast Water Record Book shall be in a working language of the ship. If that language is not English, French or Spanish, the entries shall contain a translation into one of those languages. When entries in an official national language of the State whose flag the ship is entitled to fly are also used, these shall prevail in case of a dispute or discrepancy."

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* Refer to the *Guidelines for the use of electronic record books under the BWM Convention* (resolution MEPC.372(80), as may be amended).

ANNEX 2

RESOLUTION MEPC.384(81)
(adopted on 22 March 2024)

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

Amendments to Protocol I of MARPOL

(Reporting procedures for the loss of containers)

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 eighty-first session, proposed amendments to Protocol I of MARPOL concerning reporting procedures for the loss of containers.

1 ADOPTS, in accordance with article 16(2)(d) of MARPOL, amendments to Protocol I of MARPOL, 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 July 2025 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 January 2026 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 ALSO REQUESTS 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 PROTOCOL I OF MARPOL

(Reporting procedures for the loss of containers)

PROTOCOL I – PROVISIONS CONCERNING REPORTS ON INCIDENTS INVOLVING HARMFUL SUBSTANCES

Article V
Reporting procedures

1 The following new paragraph 3 is inserted after existing paragraph 2:

"In case of the loss of freight container(s), the report required by article II(1)(b) shall be made in accordance with the requirements on danger messages as provided for in regulations V/31 and V/32 of the International Convention for the Safety of Life at Sea, 1974."

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ANNEX 3

RESOLUTION MEPC.385(81)
(adopted on 22 March 2024)

AMENDMENTS TO THE ANNEX OF THE PROTOCOL OF 1997 TO AMEND THE INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS, 1973, AS MODIFIED BY THE PROTOCOL OF 1978 RELATING THERETO

Amendments to MARPOL Annex VI

(Low-flashpoint fuels and other fuel oil related issues, marine diesel engine replacing steam system, accessibility of data and inclusion of data on transport work and enhanced granularity in the IMO Ship Fuel Consumption Database (IMO DCS))

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 article 16 of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocols of 1978 and 1997 relating thereto (MARPOL), which specifies the amendment procedure and confers upon the appropriate body of the Organization the function of considering amendments thereto for adoption by the Parties,

HAVING CONSIDERED, at its eighty-first session, proposed amendments to MARPOL Annex VI concerning low-flashpoint fuels and other fuel oil related issues, marine diesel engine replacing a steam system, and accessibility of data and inclusion of data on transport work and enhanced granularity in the IMO Ship Fuel Consumption Database (IMO DCS), which were circulated in accordance with article 16(2)(a) of MARPOL,

1 ADOPTS, in accordance with article 16(2)(d) of MARPOL, amendments to MARPOL Annex VI, 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 February 2025 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 August 2025 upon their acceptance in accordance with paragraph 2 above;

4 ALSO INVITES the Parties to consider the early application of the amendments to appendix IX with regard to information to be submitted to the IMO Ship Fuel Oil Consumption Database from 1 January 2025;

5 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;

6 ALSO REQUESTS 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 VI

(Low-flashpoint fuels and other fuel oil related issues, marine diesel engine replacing steam system, accessibility of data and inclusion of data on transport work and enhanced granularity in the IMO Ship Fuel Consumption Database (IMO DCS))

Regulation 2
Definitions

1 Paragraph 1.14 is replaced by the following:

"1.14 *Fuel oil* means any fuel delivered to and intended for use on board a ship."

2 A new paragraph 1.33 is inserted after existing paragraph 1.32, as follows:

"1.33 *Gas fuel* means a fuel oil with a vapour pressure exceeding 0.28 MPa absolute at a temperature of 37.8°C.*"

* Refer to paragraph 2.2.18 of the *International Code of Safety for Ships using Gases or other Low-flashpoint Fuels (IGF Code)*

Regulation 13
Nitrogen oxides (NO_X)

Major conversion

3 Paragraph 2.2 is replaced by the following:

"2.2 For a major conversion involving the replacement of a marine diesel engine with a non-identical marine diesel engine, or the installation of an additional marine diesel engine, the standards in this regulation at the time of the replacement or addition of the engine shall apply. For the purpose of this regulation, the installation of a marine diesel engine replacing a steam system shall be considered a replacement engine. In the case of replacement engines only, if it is not possible for such a replacement engine to meet the standards set forth in paragraph 5.1.1 of this regulation (Tier III, as applicable), then that replacement engine shall meet the standards set forth in paragraph 4 of this regulation (Tier II), taking into account the guidelines developed by the Organization*. The Administration shall notify the Organization in those instances where a Tier II rather than a Tier III replacement engine has been installed on or after 1 August 2025 in accordance with the provisions of this paragraph.

* Refer to the *2024 Guidelines as required by regulation 13.2.2 of MARPOL Annex VI in respect of non-identical replacement engines not required to meet the Tier III limit* (resolution MEPC.386(81)).

Regulation 14
Sulphur oxides (SO_X) and particulate matter

4 Paragraph 12 is replaced by the following:

"12 The requirements of paragraphs 10 and 11 above are not applicable to a fuel oil service system used for a low-flashpoint fuel or a gas fuel."

Regulation 18
Fuel oil availability and quality

5 The existing chapeau of paragraph 3 is replaced by the following:

"3 Fuel oil delivered to and used on board a ship to which this Annex applies shall meet the following requirements:"

6 The existing chapeau of paragraph 3.2 is replaced by the following:

"3.2 fuel oil derived by methods other than petroleum refining shall not:"

7 Paragraph 4 is replaced by the following:

"4 This regulation does not apply to coal in its solid form or nuclear fuels. Paragraphs 5.1, 8.1 and 8.2 of this regulation do not apply to a low-flashpoint fuel or a gas fuel."

8 Paragraph 5 is replaced by the following new paragraphs 5.1 and 5.2, as follows:

"5.1 For each ship subject to regulations 5 and 6 of this Annex, details of fuel oil delivered to and used on board that ship shall be recorded by means of a bunker delivery note that shall contain at least the information specified in appendix V to this Annex.

5.2 For each ship subject to regulations 5 and 6 of this Annex, details of low-flashpoint fuel or gas fuel delivered to and used on board that ship shall be recorded by means of a bunker delivery note that shall include at least the information specified in items 1 to 6 of appendix V to this Annex, the density as determined by a test method appropriate to the fuel type together with the associated temperature and a declaration signed and certified by the fuel oil supplier's representative that the fuel oil is in conformity with paragraph 3 of this regulation. In addition the sulphur content of a low-flashpoint fuel or a gas fuel delivered to a ship specifically for use on board that ship shall be documented on the bunker delivery note by the supplier in terms of either the actual value as determined by a test method appropriate to the fuel type or, with the agreement of the appropriate authority at the port of supply, a statement that the sulphur content, when tested by such a method, is less than 0.001% m/m."

9 Paragraph 9.2 is replaced by the following:

".2 require local suppliers to provide the bunker delivery note and, if applicable, the MARPOL delivered sample as required by this regulation, certified by the fuel oil supplier that the fuel oil meets the requirements of regulations 14 and 18 of this Annex; "

Regulation 27
Collection and reporting of ship fuel oil consumption data

10 New paragraphs 14 and 15 are added after existing paragraph 13, as follows:

"14 On an ad hoc basis, the Secretary-General of the Organization may share data with analytical consultancies and research entities, under strict confidentiality rules.

15 The Secretary-General of the Organization, on the request of a company, shall grant access to the fuel oil consumption reports of the company's owned ship(s) in a non-anonymized form to the general public."

Appendix I
Form of International Air Pollution Prevention (IAPP) Certificate (regulation 8)

11 Paragraph 2.3.5 is replaced by the following:

"In accordance with regulation 14.12, the requirement for fitting or designating sampling point(s) in accordance with regulation 14.10 or 14.11 is not applicable for a fuel oil service system used for a low-flashpoint fuel or a gas fuel……□"

Appendix IX
Information to be submitted to the IMO Ship Fuel Oil Consumption Database (regulation 27)

12 Appendix IX is replaced by the following:

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Appendix IX

Information to be submitted to the IMO Ship Fuel Oil Consumption Database (regulation 27)

Identity of the ship

IMO Number…….

Period of calendar year for which the data is submitted

Start date (dd/mm/yyyy) …….

End date (dd/mm/yyyy)……

Technical characteristics of the ship

Year of delivery…….....

Ship type, as defined in regulation 2.2 of this Annex or other (to be stated) …….

Gross tonnage[1] (GT)……

Net tonnage (NT)[2] ……

Deadweight tonnage (DWT)[3] …….

Power output (rated power)[4] of main and auxiliary reciprocating internal combustion engines over 130 kW (to be stated in kW) ……...

Attained EEDI[5] (if applicable)..…… ……

Attained EEXI[6] (if applicable) ……

Ice class[7] ……...

Fuel oil consumption data

Total fuel oil consumption by fuel oil type[5] in metric tonnes and methods used for collecting fuel oil consumption data:…… …….

Total fuel oil consumption by fuel oil type[5] per consumer type in metric tonnes and methods used for collecting fuel oil consumption data:

Main Engine(s) …….

Auxiliary Engine(s)/Generator(s) ……

Oil-fired Boiler(s) ……..

Others (specify) ……

Fuel oil consumption while the ship is not under way by fuel oil type[5] per consumer type in metric tonnes and methods used for collecting fuel oil consumption data:

Main Engine(s) …….

Auxiliary Engine(s)/Generator(s) ……

Oil-fired Boiler(s) ……..

Others (specify) ……

Total distance travelled (nm)……

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1 Gross tonnage should be calculated in accordance with the International Convention on Tonnage Measurement of Ships, 1969.

2 Net tonnage should be calculated in accordance with the International Convention on Tonnage Measurement of Ships, 1969. If not applicable, note "N/A".

3 DWT means the difference in tonnes between the displacement of a ship in water of relative density of 1,025 kg/m^3 at the summer load draught and the lightweight of the ship. The summer load draught should be taken as the maximum summer draught as certified in the stability booklet approved by the Administration or an organization authorized by it. If not applicable, note "N/A".

4 Rated power means the maximum continuous rated power as specified on the nameplate of the engine.

5 Refer to the *2022 Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships* (resolution MEPC.364(79)).

6 Refer to the *2022 Guidelines on the method of calculation of the attained Energy Efficiency Existing Ship Index (EEXI)* (resolution MEPC.350(78)).

7 Ice class should be consistent with the definition set out in the International Code for Ships Operating in Polar Waters (Polar Code) (resolutions MEPC.264(68) and MSC.385(94)). If not applicable, note "N/A".

Laden distance travelled (nm) (on a voluntary basis) ……

Hours under way ……..

Total amount of onshore power supplied (kWh) ……..….

For ships to which regulation 28 of MARPOL Annex VI applies

Total transport work …….

Applicable CII[8]: ☐ AER ☐ cgDIST

Required annual operational CII[9]……...

Attained annual operational CII before any correction[10]……

Attained annual operational CII[11]……...

Installation of innovative technology[12], if applicable: ☐ A ☐ B-1 ☐ B-2 ☐ C-1 ☐ C-2

Operational carbon intensity rating[13]: ☐ A ☐ B ☐ C ☐ D ☐ E

CII for trial purpose (on voluntary basis)[14]:

☐ EEPI (gCO_2/t/nm) ……

☐ cbDIST (gCO_2/berth/nm) ……

☐ clDIST (gCO_2/m/nm) ……..

☐ EEOI (gCO_2/t/nm)[15] ……..."

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8 Refer to the *2022 Guidelines on operational carbon intensity indicators and the calculation methods (CII guidelines, G1)* (resolution MEPC.352(78)).

9 Refer to the *2022 Guidelines on the reference lines for use with operational carbon intensity indicators (CII reference lines guidelines, G2)* (resolution MEPC.353(78)) and *2021 Guidelines on the operational carbon intensity reduction factors relative to reference lines (CII reduction factors guidelines, G3)* (resolution MEPC.338(76)).

10 As calculated in accordance with the *2022 Guidelines on operational carbon intensity indicators and the calculation methods (CII guidelines, G1)* (resolution MEPC.352(78)) before any correction using *Interim guidelines on correction factors and voyage adjustments for CII calculations (G5)* (resolution MEPC.355(78)).

11 As calculated in accordance with the *2022 Guidelines on operational carbon intensity indicators and the calculation methods (CII guidelines, G1)* (resolution MEPC.352(78)) and having been corrected taking into account *Interim guidelines on correction factors and voyage adjustments for CII calculations (G5)* (resolution MEPC.355(78)).

12 Refer to the *2021 Guidance on treatment of innovative energy efficiency technologies for calculation and verification of the attained EEDI and EEXI* (MEPC.1/Circ.896).

13 Refer to the *2022 Guidelines on the operational carbon intensity rating of ships (CII rating guidelines, G4)* (resolution MEPC.354(78)).

14 Refer to the *2022 Guidelines on operational carbon intensity indicators and the calculation methods (CII guidelines, G1)* (resolution MEPC.352(78)).

15 Refer to the *Guidelines for voluntary use of the ship energy efficiency operational indicator (EEOI)* (MEPC.1/Circ.684).

ANNEX 4

RESOLUTION MEPC.386(81)
(adopted on 22 March 2024)

2024 GUIDELINES AS REQUIRED BY REGULATION 13.2.2 OF MARPOL ANNEX VI IN RESPECT OF NON-IDENTICAL REPLACEMENT ENGINES NOT REQUIRED TO MEET THE TIER III LIMIT

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,

RECALLING ALSO that, at its fifty-eighth session, it adopted, by resolution MEPC.176(58), a revised MARPOL Annex VI (hereinafter referred to as "MARPOL Annex VI") which significantly strengthens the emission limits for nitrogen oxides (NO_x) in light of technological improvements and implementation experience,

NOTING that regulation 13.2.2 of MARPOL Annex VI specifies which NO_x emission standard shall be applied when a marine diesel engine is replaced with a non-identical marine diesel engine,

RECOGNIZING the need to develop guidelines to set forth criteria for when it is not possible for a replacement engine to meet the standards in regulation 13.5.1.1 (Tier III),

RECALLING that, at its sixty-fifth session, it adopted, by resolution MEPC.230(65), the *2013 Guidelines as required by regulation 13.2.2 of MARPOL Annex VI in respect of non-identical replacement engines not required to meet the Tier III limit* (hereinafter referred to as the "2013 Guidelines"),

RECOGNIZING the need to update the 2013 Guidelines,

HAVING CONSIDERED, at its eighty-first session, the draft *2024 Guidelines as required by regulation 13.2.2 of MARPOL Annex VI in respect of non-identical replacement engines not required to meet the Tier III limit*, prepared by the Sub-Committee on Pollution Prevention and Response at its tenth session,

1 ADOPTS the *2024 Guidelines as required by regulation 13.2.2 of MARPOL Annex VI in respect of non-identical replacement engines not required to meet the Tier III limit*, as set out in the annex to the present resolution;

2 INVITES Administrations to take the annexed Guidelines into account when considering whether the installation of a Tier III marine diesel engine is not feasible in the case of a non-identical marine diesel engine;

3 REQUESTS the Parties to MARPOL Annex VI and other Member Governments to bring the annexed Guidelines to the attention of shipowners, ship operators, shipbuilders, marine diesel engine manufacturers and any other interested groups;

4 INVITES Administrations that have found prior to 1 August 2025 that the installation of a Tier III engine was not feasible, to nevertheless inform the Organization of those decisions using the template set out in the appendix to the Guidelines;

5 AGREES to keep these Guidelines under review in light of the experience gained with their application;

6 DETERMINES that these Guidelines supersede the 2013 Guidelines adopted by resolution MEPC.230(65).

ANNEX

2024 GUIDELINES AS REQUIRED BY REGULATION 13.2.2 OF MARPOL ANNEX VI IN RESPECT OF NON-IDENTICAL REPLACEMENT ENGINES NOT REQUIRED TO MEET THE TIER III LIMIT

1 When it becomes necessary to replace an engine to which regulation 13 of MARPOL Annex VI applies in principle (power output of more than 130 kW) the non-identical replacement engine shall comply with the standards set forth in paragraph 5.1.1 of the respective regulation (Tier III) when operating in an area designated under regulation 13.6 of MARPOL Annex VI if the replacement takes place on or after the dates in sub-paragraphs of regulation 13.5.1.2, as appropriate unless:

.1 a replacement engine of similar rating complying with Tier III is not commercially available; or

.2 the replacement engine, in order to be brought into Tier III compliance, needs to be equipped with a NO_x reducing device which owing to:

.1 size cannot be installed in the limited space available on board; or

.2 extensive heat release could have an adverse impact on the ships structure, sheeting, and/or equipment whilst additional ventilation and/or insulation of the engine-room/compartment will not be possible.

2 In making the determination that a Tier III engine is not a feasible replacement engine for a ship, it should be necessary to evaluate not just engine dimensions and weight but may also include other pertinent ship characteristics. These pertinent characteristics could include:

.1 downstream ship components such as drive shafts, reduction gears, cooling systems, exhaust and ventilation systems, and propeller shafts;

.2 electrical systems for diesel generators (indirect drive engines); and

.3 such other ancillary systems and ship equipment that would affect the choice of an engine.

3 Restrictions should also be considered concerning engine adjustment/matching needed to meet boundary conditions and performance data necessary for SCR operation at all relevant mode points.

4 If the replacement engine is part of a multi-engine (twin-engine) arrangement and it is replacing an engine that is not a Tier III compliant engine owing to it having been installed prior to the Tier III implementation date, a need to match a replacement engine within a multi-engine arrangement should be part of the criteria to be considered. In such cases, if it were decided to exempt a replacement engine in multi-engine arrangements, it must be clear that is where engines are installed as matched pairs (or more) as propulsion engines and that matching is necessary to ensure comparable manoeuvring/drive response rather than where multiple engines are installed such as in the case of generators.

5 A replacement engine that meets the Tier III limit should be installed provided it does not incur an increase in the ship's electrical demand beyond the installed capacity.

6 In no case should modification to the ship's structure be allowed which weakens its structural stability below the acceptable level.

7 The Administration should consider how far the shipowner's specification of the device will determine whether a non-identical replacement engine is not required to meet the Tier III limit (for example, by requiring an excessive urea storage capacity, relative to bunker capacity, or that the SCR device is not to increase engine weight/volume by more than an unjustifiably low percentage).

8 There may be differences between a Tier III and a Tier II engine that should **not** affect the determination of whether a non-identical replacement engine should not be required to meet the Tier III limit, such as:

.1 warranty period or life expectancy;

.2 cost; or

.3 production lead time.

9 The shipowner should provide evidence to the Administration that a Tier III engine cannot be installed and should report specifically what prevents a Tier III compliant engine from being installed, taking into account the provisions of these guidelines. The shipowner should document the search for compliant Tier III engines and explain why the closest available engine with respect to size or performance is not appropriate for the ship. The search should include engines produced by manufacturers other than the original engine's manufacturer. This documentation, duly endorsed by the Administration, should be kept with the replacement engine's EIAPP Certificate.

10 In addition to the requirements of paragraphs 1 to 3 and 5 to 9, which specifically cover the replacement of one marine diesel engine by another, in the case where a steam system is to be replaced by a marine diesel engine, an Administration should also take the following points into account in evaluating a proposal that that engine should be Tier II compliant as opposed to Tier III:

.1 the total available engine-room space, including tanks, made available by the removal of the steam system being replaced should be considered with regard to the space and support service requirements of a Tier III engine;

.2 if the steam system is not removed but only decommissioned, that should not affect the determination as to whether a Tier III replacement engine could be installed; and

.3 the level of work required to provide the structural support for the marine diesel engine to be installed should be considered in relation to any additional work required in order to accommodate a Tier III engine as to whether such additional work should reasonably be expected to be undertaken.

APPENDIX

Template for Information to be provided to the Organization by the Administration which accepts that the installation of a Tier III non-identical replacement engine was not feasible and accordingly a Tier II engine has been installed

Information to be submitted by the Administration:

1 Particulars of ship

Name of ship:
IMO Number:

2 Replacement of a marine diesel engine or a steam system*

Propulsion or non-propulsion*
If non-propulsion: Usage _____

3 Replaced marine diesel engine details (if applicable):

Number of engines:
Rated power & rated speed:
NO_x certification Tier: pre-2000, I or II*
Test cycle(s):

4 Non-identical replacement marine diesel engine details:

Number of engines:
Rated power & rated speed:
Time of replacement**:

5 Summary of why the installation of Tier III non-identical replacement marine diesel engine(s) was not feasible:

* Delete as applicable.
** Refer to the *Unified interpretations to MARPOL Annex VI* (MEPC.1/Circ.795/Rev.8, as may be revised).

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ANNEX 5

RESOLUTION MEPC.387(81)
(adopted on 22 March 2024)

INTERIM GUIDANCE ON THE APPLICATION OF THE BWM CONVENTION TO SHIPS OPERATING IN CHALLENGING WATER QUALITY CONDITIONS

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Articles 38(a) and 38(b) 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, and its functions for considering appropriate measures to facilitate the enforcement of such conventions,

RECALLING ALSO that resolution MEPC.290(71) established an experience-building phase (EBP) associated with the *International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004* (BWM Convention), in order to identify aspects of this Convention that are working well and to shed light on issues that require further attention,

RECOGNIZING that properly installed, operated and maintained type-approved ballast water management systems (BWMS) may effectively become temporarily inoperable in the various challenging water quality (CWQ) conditions that exist in a number of global ports and locations,

CONCERNED that bypassing installed BWMS in CWQ, while sometimes necessary as a last resort to permit the continued operation of ports and ships, may contaminate ballast tanks and sediments with harmful aquatic organisms and pathogens that present substantial risks for the environment, human health, property and resources where ballast water is later discharged,

EMPHASIZING its expectation that discharged ballast water meets the performance standard in regulation D-2 of the BWM Convention whenever the Convention requires this to be the case, while recognizing the challenges currently faced by ships encountering CWQ in enclosed and semi-enclosed seas,

DETERMINED to thoroughly address the issue of CWQ through the holistic review of the Convention under the experience-building phase (EBP), the scope of which includes the *Code for Approval of Ballast Water Management Systems* (BWMS Code, resolution MEPC.300(72)) and the *Guidelines for port State control under the BWM Convention* (resolution MEPC.252(67)), and avoid unintended consequences for ships already equipped with BWMS,

CONSIDERING that, in the meantime, ships urgently need guidance on managing CWQ and retaining compliance with the D-2 performance standard in subsequent discharge operations, while also considering that Administrations, BWMS manufacturers and port States would also benefit from guidance on implementing their roles with respect to CWQ,

1 ADOPTS the *Interim guidance on the application of the BWM Convention to ships operating in challenging water quality*, as set out in the annex to the present resolution;

2 REAFFIRMS the conditions for temporary non-penalization agreed in operative paragraph 4 of resolution MEPC.290(71) relating to non-compliance of a ship with the performance standard in regulation D-2 following the use of a BWMS during the EBP;

3 CALLS UPON all relevant entities to maximize the suitability and regular use of BWMS for the management of CWQ in both the short and long term, and calls particularly upon:

.1 BWMS manufacturers to develop performance improvements regarding commonly encountered water quality challenges;

.2 ships and shipyards to invest in the most suitable, robust BWMS where known and available;

.3 ships to treat as much ballast water as practicable in CWQ and use bypass as a last resort;

4 AGREES to keep this interim guidance under review in connection with the EBP.

ANNEX

INTERIM GUIDANCE ON THE APPLICATION OF THE BWM CONVENTION TO SHIPS OPERATING IN CHALLENGING WATER QUALITY (CWQ) CONDITIONS

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INTRODUCTION

Purpose

1 The primary purpose of this Guidance is to assist ships in planning for compliance with the BWM Convention and the D-2 discharge standard when a type-approved ballast water management system (BWMS) that has been properly installed, operated and maintained encounters operational limitations or has difficulty meeting operational demand in challenging water quality (CWQ) conditions. The Guidance may also serve as a practical operational guide for ships and voyage planners in this regard.

2 This Guidance also includes sections intended to guide Administrations, port States and BWMS manufacturers in providing appropriate support and oversight to ships before, during and after CWQ operations.

3 This interim Guidance has been developed while the Committee takes steps through the experience-building phase (EBP) associated with the BWM Convention (resolution MEPC.290(71)) to improve the performance and reliability of BWMS.

4 This Guidance includes recommended steps that can be taken to restore or maintain effective operation of a BWMS when operating in CWQ. These include steps to identify when a system is inoperable owing to CWQ; actions to avoid bypass of the system; steps to recover from bypass including steps to return to compliance with the D-2 discharge standard; and planning, record-keeping and communication principles.

5 This Guidance does not address situations in which a BWMS is inoperable for reasons unrelated to CWQ, or in which inadequate performance is due to installation, operation or maintenance issues. Such situations should be addressed on a case-by-case basis in consultation with the Administration of the ship and implicated port States (see also the *Guidance on contingency measures under the BWM Convention* (BWM.2/Circ.62, as may be revised)).

Principles

6 Ships, supported by BWMS manufacturers, should plan for circumstances where CWQ may be experienced and include procedures informed by this Guidance in their approved Ballast Water Management Plan (BWMP). This Guidance is not intended to reduce the importance of selecting the most suitable BWMS, as known and available, for the circumstances of the ship where appropriate. Relevant stakeholders may, for example, use the INTERTANKO CWQ database[1] until a universal platform becomes available.

7 When operating a BWMS in CWQ, encountering an operational limitation or experiencing a challenge in satisfying operational demand does not indicate a BWMS failure. A BWMS has warnings and alarms to protect the BWMS equipment and/or the ship and the triggering of these set points or flow reductions demonstrates proper BWMS operation as designed.

8 Triggers for implementing CWQ procedures should be included in the BWMP and should be based on the performance and self-monitoring functions of the BWMS. The list of triggers should be developed based on information provided by the BWMS manufacturer in the Operations, Maintenance and Safety Manual (OMSM), based on the BWMS design and operational limitation(s).

[1] See document MEPC 81/4/11 and https://www.intertanko.com/search-article/articleview/pcwq-database

9 CWQ triggers should be assessed on a voyage-by-voyage basis because water quality challenges may vary: from berth to berth, with conditions on board the ship, and with environmental factors such as organism density, tides and seasons.

10 Following a bypass event in a location with CWQ, decontamination to ensure that subsequent discharges meet the D-2 performance standard may include ballast water exchange through a BWMS (BWE+BWT). However, BWE+BWT alone may not be sufficient to meet the standard. This risk may be mitigated by conducting ballast water flushing as described in appendix 1.

11 Bypass should always be considered as the last resort and the BWMS should be used as far as practicable to treat ballast water with CWQ. However, some BWMS are able to treat ballast water at flow rates that are prohibitively low for practical, safe operations.

12 Ports are requested to take CWQ conditions into account and work with ships to plan arrival, departure and berthing times that will accommodate the consistent use of BWMS at expected ballasting rates. When ballasting rates are impacted by CWQ, ports are requested to exercise flexibility and support the ship in using a BWMS as long as operational demand is met (as defined in this Guidance and the ship's approved BWMP).

13 A ship fully applying this Guidance minimizes the risk of non-compliance with the D-2 standard at subsequent discharges. While this Guidance does not limit the rights of a port State in verifying a ship's compliance with the Convention (including sampling), this Guidance should be taken into account when prioritizing compliance verification activities.

14 Administrations and manufacturers of BWMS should collect information to improve the Convention and support the development of BWMS performance improvements regarding commonly encountered CWQ conditions. This information should be shared with the Committee as appropriate.

Application

15 This Guidance is applicable to:

.1 ships that are required to meet the ballast water performance standard in accordance with regulation B-3 of the BWM Convention;

.2 Administrations approving BWMPs in accordance with regulation B-1 and applying articles 13 and 14 of the BWM Convention;

.3 port States applying articles 8 to 10 of the BWM Convention; and

.4 BWMS manufacturers defining troubleshooting procedures in the OMSM in accordance with paragraph 4.8 of the BWMS Code.

Definitions

16 *Challenging water quality* (CWQ) refers to ambient uptake water having quality parameters (including but not limited to high total suspended solids,[2] or turbidity) that cause a properly installed, maintained and operated type-approved BWMS to be temporarily inoperable due to an operational limitation or an inability to meet operational demand. However, temperature and salinity are not parameters that define CWQ.

[2] Total suspended solids are defined as solids in water that can be trapped by a filter.

17 *Operational demand* means the minimum BWMS flow rate defined in the BWMP that will permit the ship to continue cargo operations while using the BWMS, which should be no greater than 50% of the BWMS treatment rated capacity (TRC).[3]

18 *Operational limitation* means an automatic shutdown of the BWMS, a critical alarm for which the BWMS OMSM directs a manual shutdown, or a safety-related circumstance that requires the shutdown of the BWMS for the protection of the BWMS equipment, the ship or its crew.[4]

19 *Pre-emptive bypass* means a BWMS bypass undertaken, prior to or during a ballasting operation, in anticipation of reaching an operational limitation or encountering an inability to meet operational demand.

20 *Reactive bypass* means a BWMS bypass undertaken during a ballasting operation upon reaching an operational limitation or encountering an inability to meet operational demand.

GUIDANCE FOR SHIPS OPERATING IN CWQ

21 This part of the guidance is intended to inform the development of Ballast Water Management Plans (BWMP), which should include ship-specific guidance and procedures identified in the conceptual overview provided in figure 1. This planning is intended to facilitate ship operations and efficiency by optimizing the performance of BWMS in CWQ, reducing the need to bypass this environmentally protective equipment and decontaminate ballast tanks.

22 While the focus of this part is on planning, its specific guidance and example process flow charts may also help ship crews reduce risks to the environment, human health, property and resources when operating in CWQ. However, this guidance should be read in conjunction with the ship-specific BWMP and OMSM.

[3] Operational demand pertains to the ship.

[4] Operational limitation pertains to the BWMS.

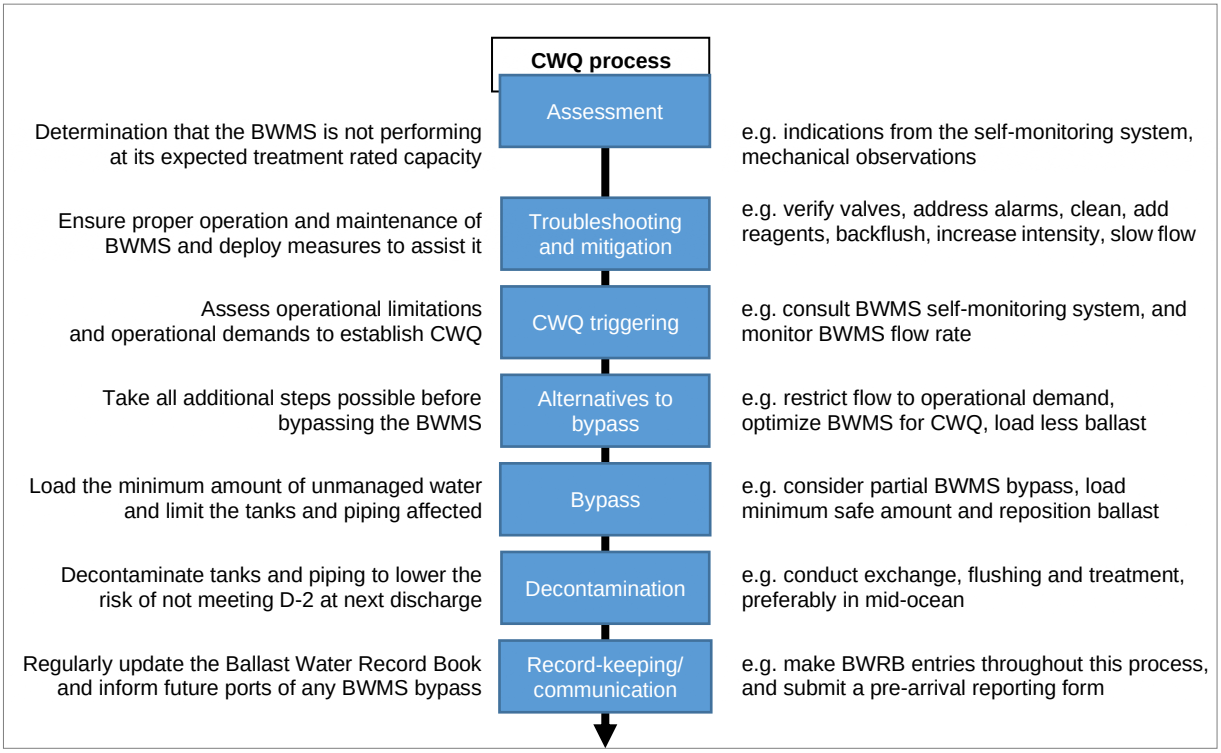


Figure 1: Conceptual overview of the CWQ process

Pre-planning

23 Operations in CWQ will be most efficient when the BWMP includes practical and realistic measures specific to the ship that take into account this Guidance, the BWMS technology installed on board, and specific instructions and procedures from the OMSM.

24 The approved BWMP should include a ship-specific definition of operational demand based on paragraph 17 that identifies the sustained flow rate below which cargo operations cannot practicably be continued by the ship. This flow rate should not be higher than 50% of the treatment rated capacity of the BWMS unless the ship's safety or stability would be affected. For example:

> "On this ship, the operational demand to practicably permit continued cargo operations without affecting the ship's safety or stability while using the BWMS is defined by a sustained flow rate of ___ m^3/h, which is 50% of the treatment rated capacity of the BWMS."

25 Developing ship-specific process flow charts based on the appended samples and manufacturer's guidance is recommended.

26 A detailed plan for at least the following items should be included in the ship-specific BWMP and BWMS operating instructions, taking into account ship safety and the maintenance and operation instructions in the OMSM. Further information and guidance on selected topics from this list are included in the sub-sections below.

.1 Maintenance: Maintenance timetables and checklists for maintaining the system in optimal condition for managing CWQ when it is encountered, including:

.1 crucial maintenance actions, such as those related to inspection, cleaning, calibration, active substance monitoring, etc.; and

.2 ensuring the availability on board of sufficient approved spare parts, Active Substances and neutralizing agents.

.2 Assessment: Indications from the BWMS self-monitoring system or a mechanical observation that the BWMS is not performing at its expected treatment rated capacity.

.3 Troubleshooting and mitigation: Procedures to identify and resolve challenges linked to the operation and maintenance of the BWMS, as well as ship-specific procedures for assisting and optimizing the BWMS in treating CWQ, with a view to completing normal ballast water treatment without bypassing the BWMS, giving consideration to operational demands.

.4 CWQ triggers: In case troubleshooting and mitigation is unsuccessful, a table of critical alarms specific to the BWMS based on the OMSM indicating that an operational limitation has been reached (see paragraph 18). This should include ship-specific procedures to be taken when an alarm is encountered.

.5 Alternatives to bypass: Pre-planned actions, considerations and procedures, taking into account the OMSM, that may clear operational limitations or allow the BWMS to meet operational demands.

.6 Bypass procedure: Steps to be taken to bypass the BWMS, including treatment of a fractional part of the ballast water stream and/or bypassing only the inoperative part of the ballast water treatment process.

.7 Decontamination: Specific procedures for decontaminating ballast tanks and/or piping to reduce the risk of bypassed water, with a view to meeting the D-2 standard at subsequent discharges. Any use of the ballast water exchange plus treatment (BWE+BWT) approach should be clearly detailed in the approved BWMP.

.8 Communication: Procedure for informing the port State(s) that will receive any ballast water discharge impacted by reactive bypass of the BWMS, before arrival of the ship in such State(s).

.9 Record-keeping: How to record CWQ situations in the Ballast Water Record Book (BWRB), in line with the *Guidance on ballast water record-keeping and reporting* (BWM.2/Circ.80, as may be revised). The BWRB should provide a detailed description of the ballast water management method(s) used, as well as location and affected tanks (tank ID).

27 The BWMP should provide that, when a ship encounters CWQ, an evaluation of ship safety should be conducted prior to the application of any steps to manage CWQ as included in this Guidance. Any safety risks identified should be evaluated to determine mitigating actions.

Assessment

28 CWQ may be impacting ballasting operations if the BWMS is not functioning at its expected treatment rated capacity, and alarms indicating an operational limitation arise or the BWMS is not meeting operational demand. A sample process for performing this assessment is set out in process diagram 1 ("Assessment of BWMS operation") in appendix 2.

29 Pre-emptively bypassing the BWMS based on historical CWQ issues experienced at a location is discouraged because water quality conditions may vary by precise location, ship and/or nearby port operations, time of day, tide, weather or seasonality. Through the self-monitoring system, the BWMS is the most suitable and technical method to precisely determine the water quality challenge at any moment and relieves the ship crew of this determination.

30 However, if a pre-emptive bypass is warranted in the case of regular visits to a port or location with known and recurring CWQ, this should be agreed in advance bilaterally between the Administration of the ship and the port State receiving the ballast water (see paragraph 52 below).

Troubleshooting and mitigation

31 If CWQ is impacting ballasting operations, as described in paragraph 28, then the crew should implement ship-specific troubleshooting procedures set out in the BWMP and the OMSM to ensure the system is being operated in accordance with proper procedure and the manufacturer's instructions. For example, this may include steps such as verifying the correct alignment of valves, that the BWMS is in the correct mode, and fully addressing any BWMS warnings and alarms.

32 The crew should also follow ship-specific procedures in the BWMP and the OMSM to verify that the BWMS has been properly maintained. For example, these procedures may include ensuring that any necessary reagents have been introduced into the BWMS, that any cleaning cycles have been run, and that no mechanical or electrical failures are present.

33 If the steps above indicate that the BWMS has been properly operated and maintained, the crew should follow procedures in the BWMP and the OMSM to deploy mitigating measures that assist the system in treating the water successfully. For example, these may include manually operating any backflushing controls, applying suitable backpressure at high differential filter pressures, maximizing UV intensity in the presence of turbid water or low UV transmittance, progressively reducing ballast water flow rate to the point of operational demand or operational limitation.

34 In planning troubleshooting and mitigation, refer to the ship's OMSM and the sample process diagram 2 ("Challenging water quality process") in appendix 2.

CWQ triggers

35 The crew should implement CWQ actions when, despite maximizing all mitigating measures, the BWMS delivers a critical alarm identified in the BWMP signalling that an operational limitation has been reached (see paragraph 18), or the BWMS is not meeting operational demand (see paragraph 17).

36 CWQ triggers relating to operational limitations should be based on the system design limitations of the BWMS as tested during the type approval process, clearly identified in the ship's approved BWMP, and should be developed with reference to the OMSM. CWQ triggers may consist of relevant alarms concerning matters such as:

.1 the required UV transmittance or UV dose of the BWMS;

.2 the maximum allowable differential pressure across the filter to prevent permanent damage to the filter element;

.3 a reduction in flow rate that is below the minimum operating requirements of the BWMS, as identified by the OMSM; and

.4 monitoring data of the BWMS when the self-monitoring system indicates the BWMS is not operating normally owing to issues such as those listed below, and that cannot be remediated through optimization of the BWMS in accordance with the BWMP:

.1 variation of pressure in filters;

.2 UV transmittance or dosage and/or the levels of dissolved organic carbon; and

.3 turbidity and/or total suspended solid that triggers an alarm of the BWMS.

Table 1: Water quality parameters for challenging water

Potential CWQ parameters	Impacts	Types of BWMS affected
Turbidity	Decreased light transfer through water due to deflection from particles/organisms (UV scatter), increased filter differential pressure	UV, filtration
UV transmissivity	Decreased penetration of UV light through seawater	UV
Dissolved organic carbon	Increased consumption of Active Substance, UV absorption	UV, Active Substance
Particulate organic carbon	Increased consumption of Active Substance, UV scatter	UV, Active Substance
Total suspended solids (sediment and/or organism load)	Increased consumption of Active Substance, UV scatter, increased filter differential pressure	UV, filtration, Active Substance

37 The relevant CWQ triggers should be reviewed and amended, as applicable, in the event of any change to the BWMS.

38 The crew should respond with the pre-planned steps in the BWMP and the OMSM for managing any critical alarm or operational demand.

Alternatives to bypass

39 Alternatives should be tried before the ship bypasses a BWMS, because bypass increases the risks ballast water poses to the environment, human health, property and resources. Bypass also increases the operational workload for ship crew to perform alternative management methods and subsequently return the BWMS and ship to normal operations for D-2 compliance.

40 Before the BWMS is bypassed, the officer designated in accordance with regulation B-1.5 should:

.1 ensure that any BWMS alarm that could be ascribed to CWQ is not due to other factors such as malfunction, maintenance, crew familiarity or experience;

.2 ensure that the BWMP and OMSM have been followed in troubleshooting the operation of the BWMS (see paragraph 31), verifying that the BWMS has been properly maintained (see paragraph 32) and ensuring that applicable mitigating measures have been applied (see paragraph 33) to optimize the performance of the BWMS before any bypass;

.3 restrict the flow rate of the BWMS to the minimum level consistent with operational demand (see paragraph 17); and

.4 consider persisting with using the BWMS in the challenging area to load the minimum safe amount of ballast water and complete remaining ballasting at a nearby less challenging location at a later time, taking into account the ship's stability and cargo condition as well as expected weather conditions.

Bypass procedure

41 The sequence of steps for safely bypassing the BWMS in the BWMP and OMSM should be followed. In undertaking an assessment of alternatives to bypassing the BWMS, refer to sample process diagram 3 ("Alternatives to bypass") in appendix 2.

42 The crew should consider that partially managed or unmanaged ballast water loaded through a bypass is likely to contaminate ballast tanks and piping systems with harmful aquatic organisms and pathogens that pose a risk to the environment, human health, property and resources. Therefore:

.1 consideration should be given to limiting the number of ballast tanks that will be exposed to partially treated or unmanaged ballast water;

.2 consideration should be given to treating the greatest possible fraction of the uptake water, by continuing to apply the BWMS to as much of the uptake water stream as practicable;

.3 in cases where only one part of a BWMS treatment process is inoperable, consideration should be given to applying the remainder of the treatment process to the uptake water, if practicable; and

.4 only the minimum safe volume of ballast water should be taken on board through the bypass following which, if necessary and practicable, the ship should proceed to a nearby area where less challenging uptake water may be obtained in order to complete ballasting using the BWMS as usual.

Decontamination

43 When a bypass is undertaken, the ship is still responsible for meeting the D-2 standard at subsequent discharge locations. The density of organisms at the location of uptake may impact the ship's return to D-2 compliance following a bypass. The recovery steps within this Guidance and the BWMP for decontaminating affected ballast tanks and piping should be followed to mitigate risks to the environment, human health, property and resources.

44 The approved BWMP should include a procedure for decontaminating ballast tanks, taking into account the example procedure set out in appendix 1 and the sample process diagram 4 in appendix 2.

45 Regulation B-4.3 does not apply to decontamination following a bypass of a BWMS, in order to restore compliance to regulation D-2.

46 In the case of a ship operating in a sea area where ballast water exchange in accordance with regulations B-4.1 and D-1 is not possible (e.g. an enclosed or semi-enclosed sea) and no ballast water exchange area has been designated, the ship should follow any instructions provided by subsequent port States to reduce the risk of discharging unmanaged or partially unmanaged ballast water and/or residuals. Port States should take into account adjacent or other States that may be affected by such instructions, as well as the safety of ships.

Communication

47 Whenever a full or partial bypass of a BWMS is undertaken, the next State receiving water from affected ballast tanks should be informed of the bypass, such as through a pre-arrival ballast water reporting form[5] when such a form is required. Any deviation from the procedures in this Guidance or the BWMP should be noted in the communication.

Record-keeping

48 In instances when the BWMS has not operated as expected owing to CWQ and may not be treating the water successfully, such circumstances carry greater environmental risk and should be recorded in the Ballast Water Record Book, taking into account the *Guidance on ballast water record-keeping and reporting* (BWM.2/Circ.80, as may be revised).

49 The ship's BWRB should include a description of:

.1 the reason why normal ballasting operations were stopped;

.2 any steps taken to optimize the treatment process and resolve BWMS technical malfunctions;

.3 the operational demands that were not met and/or operational limitations encountered (see paragraphs 17 and 18);

.4 the steps that were taken prior to a bypass being initiated (as relevant);

.5 the tanks which have received bypassed ballast water (tank ID);

.6 the date, time and location where the bypass took place; and

.7 the decontamination steps that were taken to recover from BWMS bypass as per the approved BWMP, including: the start and end locations (GPS coordinates) at which any flushing and/or exchange took place, the start date and time; end date and time, the method of exchange and the volume exchanged and/or flushed.

[5] See the *Guidance on ballast water record-keeping and reporting* (BWM.2/Circ.80, as may be revised).

GUIDANCE FOR ADMINISTRATIONS WITH RESPECT TO BALLAST WATER MANAGEMENT PLANS AND CHALLENGING WATER QUALITY

50 Administrations should ensure that ships are fully prepared to encounter CWQ. Approved BWMPs should be ship-specific, reflect the OMSM of the BWMS, and include at least: equipment maintenance procedures and intervals, predetermined mitigating measures that may preserve and optimize the treatment process in marginal conditions, a table of critical alarms that justify CWQ action, ship-specific alternatives to bypassing the BWMS, safe bypass procedures that minimize the exposure of tanks/piping to unmanaged water, and a decontamination procedure that reflects this Guidance and is safe for the ship and crew. Administrations should also ensure that crew familiarization includes relevant aspects of this Guidance, BWMS operating instructions and the environmental risks of bypassing BWMS and steps to avoid/minimize them.

51 Reactive bypasses (see paragraph 20) may be undertaken by the ship without consulting the Administration or the next port State. Port States receiving water from affected tanks should be notified before arrival (see paragraph 47).

52 Pre-emptive bypass (see paragraph 19) should be discouraged for the reasons set out in paragraph 29. However, in cases where pre-emptive bypass may be appropriate, the Administration should ensure this will not impair or damage the environment, human health, property or resources of other States. In bilaterally agreeing to the pre-emptive bypass, the Administration of the ship and the receiving port State should ensure that the pre-emptive bypass will not impair or damage the environment, human health, property or resources of any State. Pre-emptive bypass arrangements should be specific to voyages between specified ports or locations and should be documented in the ship's approved BWMP and the BWRB.

GUIDANCE FOR PORT STATE CONTROL OFFICERS WITH RESPECT TO SHIPS THAT HAVE ENCOUNTERED CHALLENGING WATER QUALITY

53 When determining compliance with the Convention by a ship that has encountered CWQ, a port State control officer should consult the BWMP, BWRB and crew. In determining that the ship has done all it can to meet the D-2 standard, the officer should use professional judgement in considering:

.1 the nature and degree of the challenge;

.2 whether challenges arose despite proper BWMS operation and maintenance;

.3 whether steps were taken to avoid or limit the bypass of a BWMS, such as efforts to mitigate challenges while continuing to use the BWMS;

.4 whether the ship and crew followed the procedures in the BWMP and recorded this in the BWRB; and

.5 whether decontamination was properly undertaken following any bypass.

54 Port States should consider that a ship fully applying this Guidance is minimizing its risk of non-compliance with the D-2 standard at subsequent discharge locations.

GUIDANCE FOR BWMS MANUFACTURERS WITH RESPECT TO PARTICIPATION IN PRE-PLANNING

55 Manufacturers of BWMS should ensure that the self-monitoring system of the BWMS records and provides clear indications to the crew on the degree of challenge being experienced by the BWMS. Specific CWQ instructions and procedures should be included in the OMSM to assist the ship and Administrations in developing and approving BWMPs, which should include specific, realistic actions the crew can follow to optimize the efficiency and performance of the BWMS. The OMSM should also include a table of unambiguous triggers necessitating actions in CWQ that could compromise the treatment process.

56 Manufacturers of BWMS should support providing appropriate technical information and possible actions to be taken in CWQ scenarios that are appropriate for the installed BWMS for inclusion in the ship-specific BWMP. This may include, but is not limited to:

.1 simple, easy to use operating instructions for the crew to allow prompt identification of BWMS operational issues and an understanding of BWMS alarms and relevant actions to be taken by crew when an alarm arises;

.2 clearly identifying critical alarms in the OMSM and BWMP;

.3 providing clear troubleshooting and mitigation instructions in the OMSM and BWMP for crews to use when CWQ is encountered; and

.4 actions that can be taken pre-emptively to support the BWMS in successfully operating even in CWQ conditions (paragraph 33).

57 Manufacturers of BWMS are encouraged to take efforts to collect relevant information and/or data from ship operators, as available, about BWMS operation in CWQ (including in specific water qualities, and/or at specific ports and locations, if appropriate) for the purposes of informing and guiding relevant stakeholders (e.g. ships, Administrations, port States, IMO) with a view to optimizing the operation of BWMS in CWQ. Ship crews are encouraged to cooperate with BWMS manufacturers to support collection of information and/or data regarding BWMS operations in CWQ.

APPENDIX 1

EXAMPLE DECONTAMINATION PROCEDURE

1 The following steps are intended to promote a return to compliance with regulation D-2 after a BWMS has been bypassed.

2 Having loaded the minimum volume of ballast water, proceed to the first suitable location for the discharge of ballast water from the following list:

.1 a location specified in regulation B-4.1; or

.2 a location specified in regulation B-4.2 by the port State in whose waters the BWMS is bypassed; or

.3 a location specified in regulation B-4.2 by the port State in whose waters the ballast water is to be discharged.

3 Replace the ballast water in each contaminated tank through ballast water exchange (in accordance with the operational and safety provisions of the BWMP), flushing and treatment.

.1 In the case of a ship using the sequential method, which is preferred:

.1 the ballast water should be fully discharged through the neutralization, if applicable, and/or treatment process for the deballasting operation of the BWMS, if technically feasible;

.2 the stripping pump (eductor) should be used to remove residual water from the tank;

.3 the concentration of organisms in remaining residual ballast water and sediments should be reduced by flushing the tank using the following sequential steps, if allowed and/or required by the receiving port State:[6]

.1 the addition of treated water to the ballast tanks (decontamination will be most effective with the addition of as much treated mid-ocean water into the tank as is safe for the ship and crew, at minimum an amount that will cover the entire bottom of the ballast tank);

.2 the mixing, through the motion of the ship, of the added water with the residual ballast water and any sediments that have settled in the tanks; and

.3 the release of the mixed waters; and

[6] The concentration of organisms in unmanaged ballast water (e.g. resulting from a bypass) is expected to exceed the D-2 standard. The purpose of flushing the emptied tanks with treated water is to reduce the concentration of organisms remaining in residual unmanaged ballast water and sediments. This practice has been shown to reduce the risk of subsequent ballast water discharges and can promote a return to D-2 compliance after the tank is refilled with treated water during exchange.

.4 the tank should be refilled with treated ballast water.

.2 The use of the flow-through or dilution method is not recommended. However, in the case of a ship which must use the flow-through or dilution method:

.1 a sufficient volume of treated uptake water should be pumped through to reduce the concentration of organisms in the tank to the standard in regulation D-2, at least 1.66 times the volume specified by regulation D-1.2, if required by the receiving port State;[7] and

.2 to reduce the risk that non-neutralized Active Substances could damage the environment, human health, property or resources, a ship with a BWMS that uses Active Substances should only conduct this exchange in a location described in regulation B-4.1 and in compliance with any precautions in the approved BWMP designed to ensure the safety of the ship and crew.

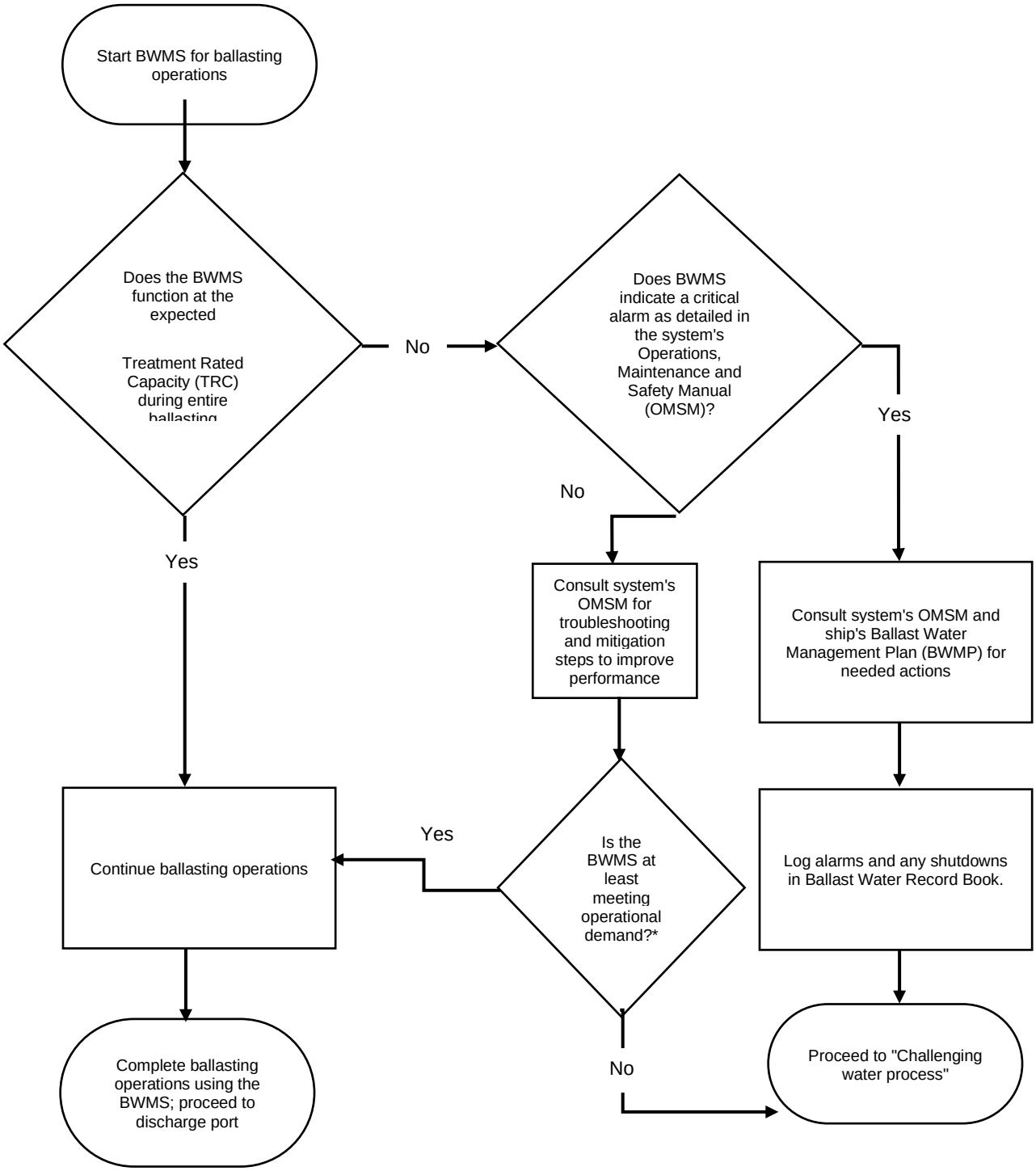
.3 Record the ballast water exchange and flushing operations in the BWRB.

[7] The concentration of organisms in unmanaged ballast water (e.g. resulting from a bypass) is expected to exceed the D-2 standard. Pumping through 1.66 times the normal volume of treated ballast water can promote a return to D-2 compliance by ensuring that a sufficient proportion of the unmanaged water (and the organisms contained within it) has been replaced with the treated water.

APPENDIX 2

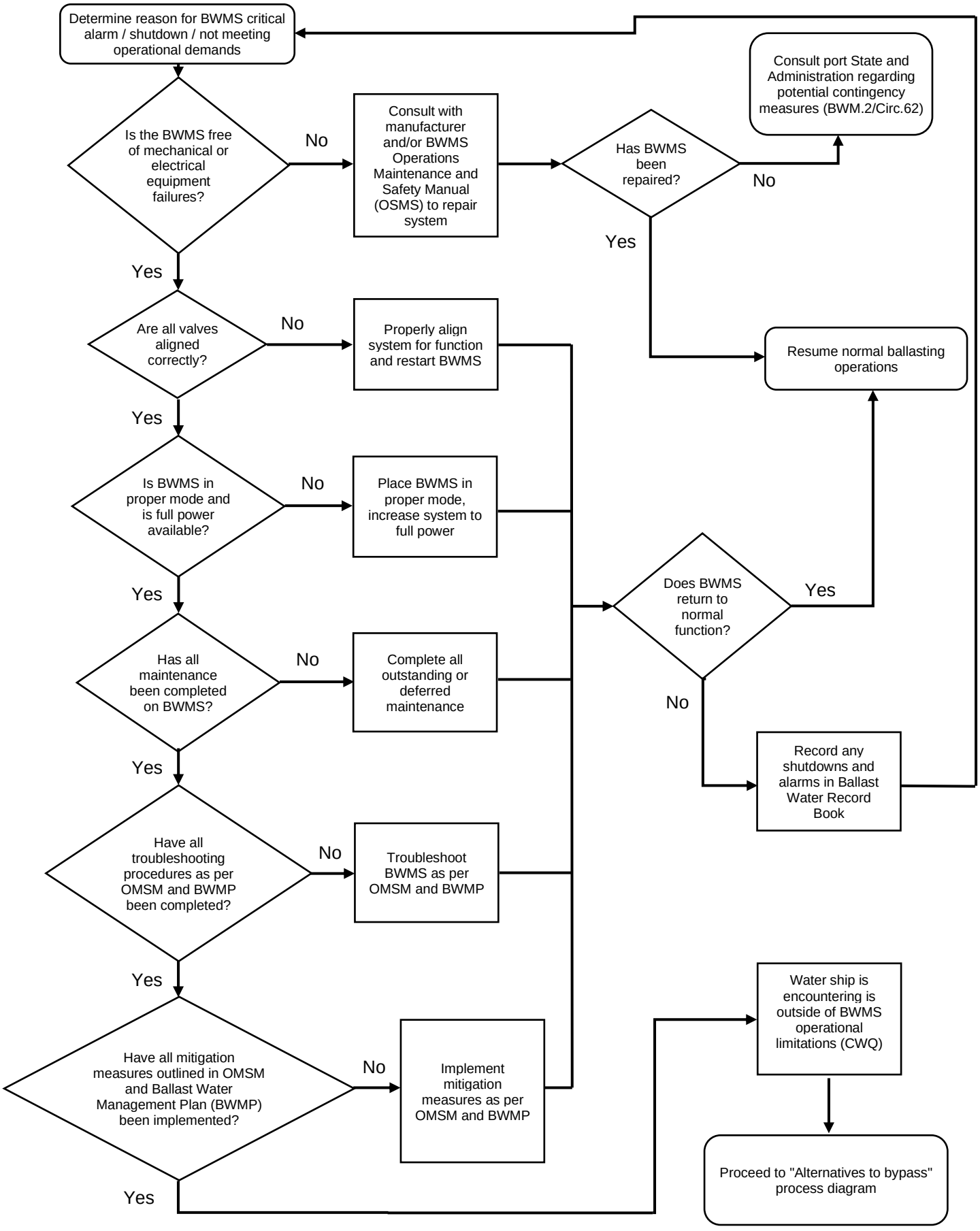
SAMPLE PROCESS DIAGRAMS FOR SHIPS BALLASTING IN AREAS WITH CHALLENGING WATER QUALITY

Process diagram 1: Assessment of BWMS operations

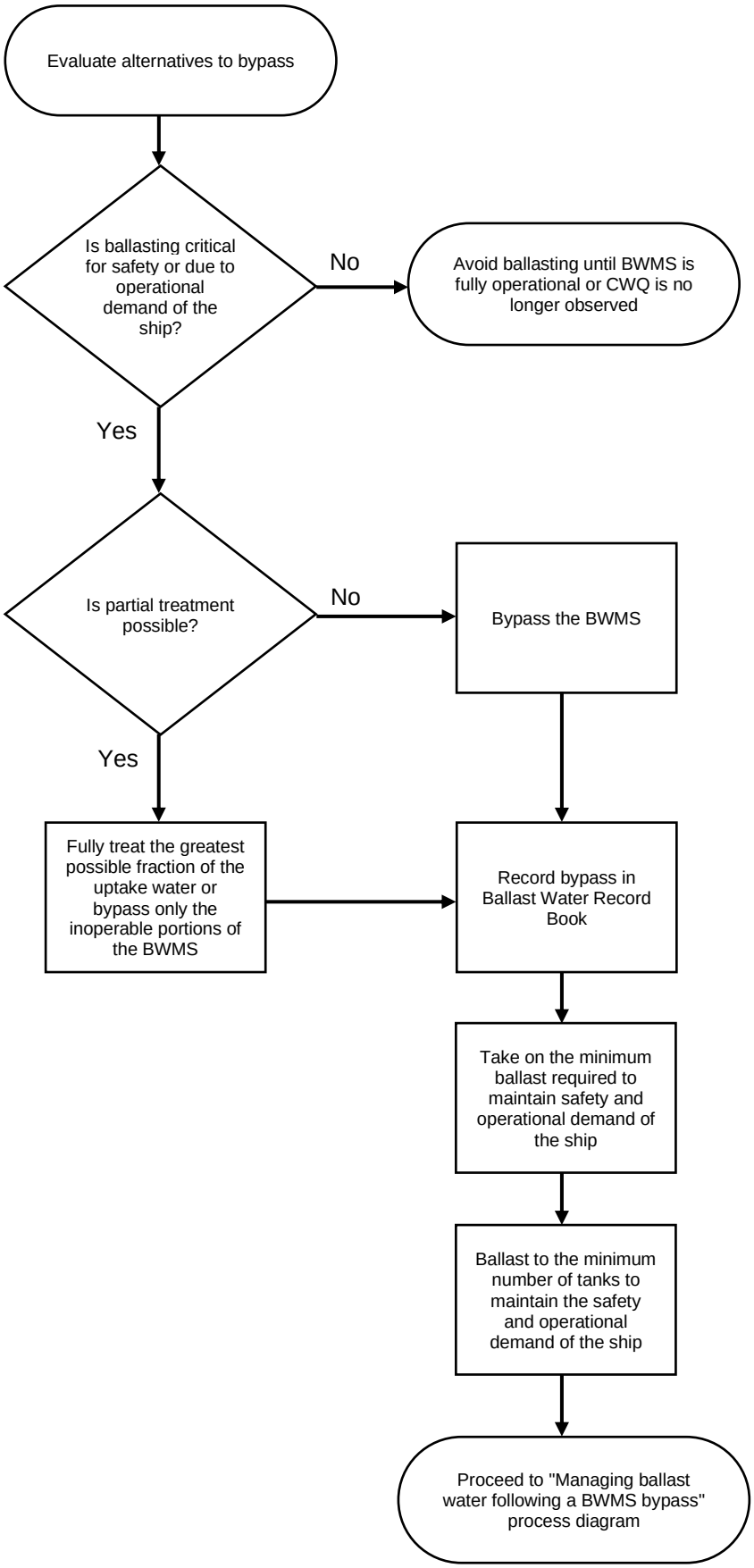


* Operational demand means the minimum BWMS flow rate defined in the approved BWMP that will permit the ship to continue cargo operations while using the BWMS, which should be no greater than 50% of the BWMS treatment rated capacity (TRC).

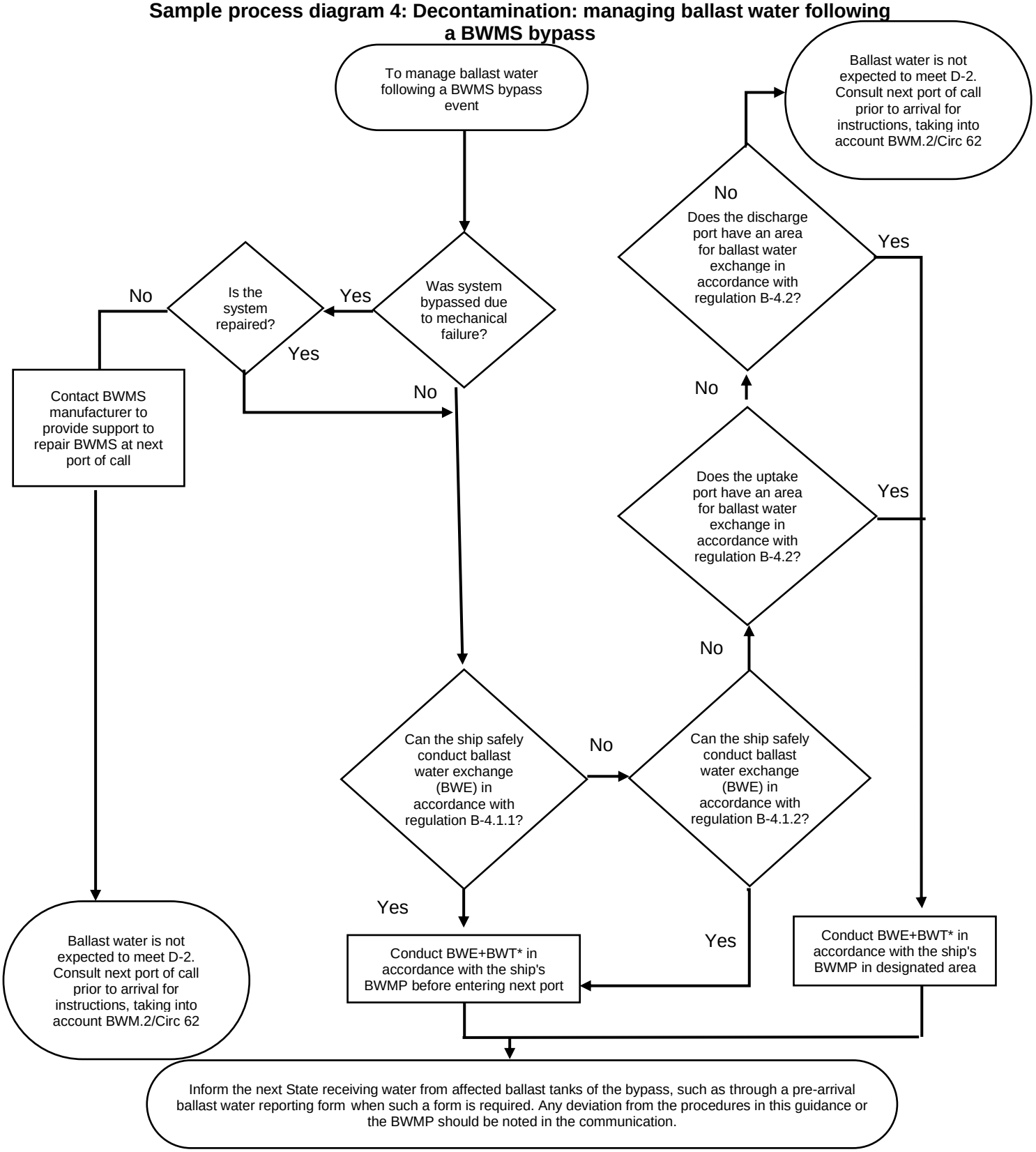
Sample process diagram 2: Challenging water quality process



Sample process diagram 3: Alternatives to bypass



Sample process diagram 4: Decontamination: managing ballast water following a BWMS bypass



* For decontamination purposes, BWE+BWT is to be done in accordance with the OMSM, approved Ballast Water Management Plan, and best practices. For the sequential method, ballast tanks should be emptied, residual ballast water and sediments should be managed (by flushing the tank with treated water, if allowed and/or required by the receiving port State), and then the tank should be refilled with treated water. For non-sequential methods, a sufficient volume of treated uptake water should be pumped through to reduce the concentration of organisms in the tank to the standard in regulation D-2, at least 1.66 times the volume specified by regulation D-1.2, if required by the receiving port State. The BWMS should be used during emptying of contaminated tanks, as well as subsequent uptakes, flushing and discharges during decontamination, if technically feasible. See appendix 1.

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ANNEX 6

RESOLUTION MEPC.388(81)
(adopted on 22 March 2024)

AMENDMENTS TO THE 2022 GUIDELINES FOR THE DEVELOPMENT OF A SHIP ENERGY EFFICIENCY MANAGEMENT PLAN (SEEMP) (RESOLUTION MEPC.346(78))

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 that regulation 26 of MARPOL Annex VI requires each ship to keep on board a Ship Energy Efficiency Management Plan (SEEMP), to be developed and reviewed, taking into account the guidelines adopted by the Organization,

NOTING ALSO that, at its seventy-eighth session, it adopted, by resolution MEPC.346(78), the *2022 Guidelines for the development of a Ship Energy Efficiency Management Plan (SEEMP)*,

HAVING CONSIDERED, at its eighty-first session, proposed amendments to the *2022 Guidelines for the development of a Ship Energy Efficiency Management Plan (SEEMP)*,

1 ADOPTS amendments to the *2022 Guidelines for the development of a Ship Energy Efficiency Management Plan (SEEMP)*, the text of which is set out in the annex to the present resolution;

2 REQUESTS the Parties to MARPOL Annex VI and other Member Governments to bring the annexed amendments to the attention of masters, seafarers, shipowners, ship operators and any other interested parties.

ANNEX

AMENDMENTS TO THE 2022 GUIDELINES FOR THE DEVELOPMENT OF A SHIP ENERGY EFFICIENCY MANAGEMENT PLAN (SEEMP) (RESOLUTION MEPC.346(78))

1 A new paragraph 2.5 is added after paragraph 2.4, as follows:

"2.5 *Consumer type* means a type of engine or set of engines, boiler, fuel cell or others used for the same purpose."

2 Section 7 is replaced by the following:

"**7 GUIDANCE ON METHODOLOGY FOR COLLECTING DATA ON FUEL OIL CONSUMPTION, DISTANCE TRAVELLED AND HOURS UNDER WAY AND OTHER ITEMS**

Total annual fuel oil[1] consumption

7.1 Fuel oil consumption should include all the fuel oil consumed on board including but not limited to the fuel oil consumed by the main engines, auxiliary engines, gas turbines, boilers and inert gas generator, for each type of fuel oil consumed, regardless of whether a ship is under way or not. Methods for collecting data on annual fuel oil consumption in metric tonnes include (in no particular order):

.1 method using bunker delivery notes (BDNs):

This method determines the annual total amount of fuel oil used based on BDNs, which are required for fuel oil for combustion purposes delivered to and used on board a ship in accordance with regulation 18 of MARPOL Annex VI; BDNs are required to be retained on board for three years after the fuel oil has been delivered. The Data Collection Plan should set out how the ship will operationalize the summation of BDN information and conduct tank readings. The main components of this approach are as follows:

.1 annual fuel oil consumption would be the total mass of fuel oil used on board the vessel as reflected in the BDNs. In this method, the BDN fuel oil quantities would be used to determine the annual total mass of fuel oil consumption, plus the amount of fuel oil left over from the last calendar year period and less the amount of fuel oil carried over to the next calendar year period;

.2 to determine the difference between the amount of remaining tank oil before and after the period, the tank reading should be carried out at the beginning and the end of the period;

.3 in the case of a voyage that extends across the data reporting period, the tank reading should occur by tank monitoring at the ports of departure and arrival of the voyage and by statistical methods, such as rolling average using voyage days;

[1] Regulation 2.1.14 of MARPOL Annex VI defines "fuel oil" as any fuel delivered to and intended for combustion purposes for propulsion or operation on board a ship, including gas, distillate and residual fuels.

.4 fuel oil tank readings should be carried out by appropriate methods such as automated systems, soundings and dip tapes. The method for tank readings should be specified in the Data Collection Plan;

.5 the amount of any fuel oil offloaded should be subtracted from the fuel oil consumption of that reporting period. This amount should be based on the records of the ship's oil record book; and

.6 any supplemental data used for closing identified difference in bunker quantity should be supported with documentary evidence;

.2 method using flow meters:

This method determines the annual total amount of fuel oil consumption by measuring fuel oil flows on board by using flow meters. In case of the breakdown of flow meters, manual tank readings or other alternative methods will be conducted instead. The Data Collection Plan should set out information about the ship's flow meters and how the data will be collected and summarized, as well as how necessary tank readings should be conducted, as follows:

.1 annual fuel oil consumption may be the sum of daily fuel oil consumption data of all relevant fuel oil consuming processes on board measured by flow meters;

.2 the flow meters applied to monitoring should be located so as to measure all fuel oil consumption on board. The flow meters and their link to specific fuel oil consumers should be described in the Data Collection Plan;

.3 note that it should not be necessary to correct this fuel oil measurement method for sludge if the flow meter is installed after the daily tank as sludge will be removed from the fuel oil prior to the daily tank;

.4 the flow meters applied to monitoring fuel oil flow should be identified in the Data Collection Plan. Any consumer not monitored with a flow meter should be clearly identified, and an alternative fuel oil consumption measurement method should be included; and

.5 calibration of the flow meters should be specified. Calibration and maintenance records should be available on board;

.3 method using bunker fuel oil tank monitoring on board:

.1 to determine the annual fuel oil consumption, the amount of daily fuel oil consumption data measured by tank readings which are carried out by appropriate methods

such as automated systems, soundings and dip tapes will be aggregated. The tank readings will normally occur daily when the ship is at sea and each time the ship is bunkering or de-bunkering; and

.2 the summary of monitoring data containing records of measured fuel oil consumption should be available on board;

.4 method using LNG cargo tank monitoring on board:

LNG ships use the Custody Transfer Monitoring System (CTMS) to monitor/record the cargo volumes inside the tanks. When calculating the consumption:

.1 the LNG liquid volume consumed is converted to mass using the methane density of 422 kg/m^3. This is because LNG is transported at methane boiling point, while other heavier hydrocarbons have a higher boiling point and remain at liquid state; and

.2 nitrogen mass content is subtracted for each laden voyage from LNG consumption as it does not contribute to CO_2 emissions;

.5 method using cargo tank monitoring on board for ships using cargo other than LNG as a fuel:

.1 to determine the annual fuel oil consumption, the amount of daily fuel oil consumption data measured by tank readings which are carried out by appropriate methods to the cargo used as a fuel. The method for tank readings should be specified in the SEEMP Data Collection Plan; and

.2 the tank readings will normally occur daily when the ship is at sea and each time the ship is loading or discharging cargo; and the summary of monitoring data containing records of measured fuel oil consumption should be available on board.

7.2 Any corrections, e.g. density, temperature, nitrogen content for LNG, if applied, should be documented.[2]

Fuel oil consumption per consumer type

7.3 For the collection of fuel oil consumption per consumer type (main engines, auxiliaries, boilers and others), the methods can include:

.1 method using flow meters:

[2] For example, ISO 8217 provides a method for liquid fuel.

This method determines the annual fuel oil consumption by measuring fuel oil flows on board by using flow meters. In case of the breakdown of flow meters, manual tank readings or other alternative methods will be conducted instead. The Data Collection Plan should set out information about the ship's flow meters and how the data will be collected and summarized, as well as how necessary tank readings should be conducted, as follows:

.1 annual fuel oil consumption may be the sum of daily fuel oil consumption data of each consumer type on board measured by flow meters;

.2 the flow meters applied to monitoring should be located so as to measure all fuel oil consumption for each consumer type;

.3 note that it should not be necessary to correct this fuel oil measurement method for sludge if the flow meter is installed after the daily tank as sludge will be removed from the fuel oil prior to the daily tank;

.4 the flow meters applied to monitoring fuel oil flow and their link to specific fuel consumer types should be identified in the Data Collection Plan. Any individual consumer of a consumer type not monitored with a flow meter should be clearly identified, and an alternative fuel oil consumption measurement method should be included; and

.5 calibration of the flow meters should be specified. Calibration and maintenance records should be available on board;

.2 method using bunker fuel oil tank monitoring on board:

.1 to determine the annual fuel oil consumption of each consumer type, the amount of daily fuel oil consumption data measured by tank readings which are carried out by appropriate methods such as automated systems, soundings and dip tapes will be aggregated. The tank readings will normally occur daily when the ship is at sea and each time the ship is bunkering or de-bunkering; and

.2 the summary of monitoring data containing records of measured fuel oil consumption should be available on board;

7.4 If there is a consumer type whose fuel oil consumption cannot be determined directly according to one of the methods indicated in paragraphs 7.3.1 and 7.3.2, the annual fuel oil consumption of that consumer type should be determined according to one of the following methods. The method used to determine the annual fuel oil consumption of each consumer type should be described in detail in the Data Collection Plan. Note that each consumer type may use a different method to measure fuel oil consumption.

.1 method using subtraction:

If the fuel consumption for only one of the consumer types is not available, the fuel consumption of this consumer type may be derived by subtracting the fuel consumption of the other consumer types from the total annual fuel oil consumption measured in paragraph 7.1; and

.2 method using estimated fuel oil consumption:

In cases where none of the above methods in paragraphs 7.3.1, 7.3.2 and 7.4.1 can be applied, an alternative method that is to the satisfaction of the Administration or any organization recognized by it may be used to estimate the annual fuel oil consumption of the consumer type, based for example on manufacturer data or actual historic fuel consumption for a specified period.

Conversion factor C_F

7.5 If fuel oils are used that do not fall into one of the categories as described in the *2022 Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships* (resolution MEPC.364(79)), and have no C_F-factor assigned (e.g. some "hybrid fuel oils"), the fuel oil supplier should provide a C_F-factor for the respective product supported by documentary evidence.

Distance travelled

7.6 Appendix IX of MARPOL Annex VI specifies that distance travelled should be submitted to the Administration and:

.1 distance travelled over ground in nautical miles should be recorded in the logbook in accordance with SOLAS regulation V/28.1;[3]

.2 the distance travelled while the ship is under way under its own propulsion should be included in the aggregated data of distance travelled for the calendar year; and

.3 other methods to measure distance travelled accepted by the Administration may be applied. In any case, the method applied should be described in detail in the Data Collection Plan.

7.7 Laden distance should be calculated as the distance sailed when the ship is loaded.

Hours under way

7.8 Appendix IX of MARPOL Annex VI specifies that hours under way should be submitted to the Administration. Hours under way should be an aggregated duration while the ship is under way under its own propulsion.

[3] Distance travelled measured using satellite data is distance travelled over the ground.

Data quality

7.9 The Data Collection Plan should include data quality control measures which should be incorporated into the existing safety management system. Additional measures to be considered could include:

.1 the procedure for identification of data gaps and correction thereof; and

.2 the procedure to address data gaps if monitoring data is missing, for example, flow meter malfunctions.

Total amount of onshore power supplied

7.10 Total amount of onshore power supplied should be calculated as the sum of amount of onshore power supplied in kWh. The amount of onshore power supplied should be recorded based on relevant document by power supplier. The document should be stored. This information as shown on the bill from the port or electricity provider could be included in the electronic record.

Total transport work

7.11 Total transport work is the annual sum of each voyage's transport work which is distance sailed multiplied by cargo carried during a voyage. Relevant transport work metrics per ship types are provided in Table 1 below.

Table 1: Transport work to be reported per ship type

Ship type	**Transport work metric**
bulk carriers, tankers, combination carriers, gas carriers, LNG carriers, general cargo ships, ro-ro cargo ships (vehicle carriers), ro-ro cargo ships	$\sum_v (cargo\_mass_v \times distance_v)$
containerships	$\sum_v ((cargo\_mass_v + container\_mass_v) \times distance_v))$ and $\sum_v (No\_of\_TEU_v \times distance_v)$
cruise passenger ships	$\sum_v (No\_of\_passengers_v \times distance_v)$
ro-ro passenger ships	$\sum_v (No\_of\_passengers_v \times distance_v)$ and $\sum_v (cargo\_mass_v \times distance_v)$

A standardized data reporting format

7.12 Regulation 27.3 of MARPOL Annex VI states that the data specified in appendix IX of the Annex are to be communicated electronically using a standardized form developed by the Organization. The collected data should be reported to the Administration in the standardized format shown in appendix 3."

3 Appendix 2, section 4 is replaced by the following:

4 Ship engines and other fuel oil consumers and fuel oil types used

	Engines or other fuel oil consumer type	Power	Fuel oil types
1	Type/model of main engine	(kW)	
2	Type/model of auxiliary engine	(kW)	
3	Boiler	(…)	
4	Inert gas generator	(…)	
5	Others (Specify)	(…)	

4 Appendix 2, sections 6 and 7 are replaced by the following:

"6 Method to measure fuel oil consumption

The applied methods for measurement for each consumer type of this ship are given below. The description explains the procedure for measuring data and calculating annual values, measurement equipment involved, etc.

Engines or other fuel oil consumer type	**Method**	**Description**
Type/model of main engine		
Type/model of auxiliary engine		
Boiler		
Others (Specify)		

7 Method to measure distance travelled including laden distance

Description

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ANNEX 7

RESOLUTION MEPC.389(81)
(adopted on 22 March 2024)

AMENDMENTS TO THE 2022 GUIDELINES FOR ADMINISTRATION VERIFICATION OF SHIP FUEL OIL CONSUMPTION DATA AND OPERATIONAL CARBON INTENSITY (RESOLUTION MEPC.348(78))

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 that regulation 27.7 of MARPOL Annex VI requires that ship fuel oil consumption data be verified according to procedures established by the Administration, taking into account guidelines developed by the Organization,

NOTING ALSO that regulation 28.6 of MARPOL Annex VI specifies that the attained annual operational CII shall be documented and verified against the required annual operational CII to determine operational carbon intensity rating, taking into account the guidelines developed by the Organization,

NOTING FURTHER that, at its seventy-eighth session, it adopted, by resolution MEPC.348(78), the *2022 Guidelines for Administration verification of ship fuel oil consumption data and operational carbon intensity*,

HAVING CONSIDERED, at its eighty-first session, proposed amendments to the *2022 Guidelines for Administration verification of ship fuel oil consumption data and operational carbon intensity*,

1 ADOPTS amendments to the *2022 Guidelines for Administration verification of ship fuel oil consumption data and operational carbon intensity*, as set out in the annex to the present resolution;

2 REQUESTS the Parties to MARPOL Annex VI and other Member Governments to bring the annexed amendments to the attention of masters, seafarers, shipowners, ship operators and any other interested parties.

ANNEX

AMENDMENTS TO THE 2022 GUIDELINES FOR ADMINISTRATION VERIFICATION OF SHIP FUEL OIL CONSUMPTION DATA AND OPERATIONAL CARBON INTENSITY (RESOLUTION MEPC.348(78))

1 Paragraph 4.1.5 is replaced by the following:

"4.1.5 copies of documents containing information on the amount of fuel oil consumption, distance travelled, hours under way for the ship's voyages and the other data during the reporting period (e.g. the ship's official logbook, oil record book, BDNs, arrival/noon/departure reports, and from auto-log data files); and"

2 The Table in appendix 2 is replaced by the following:

SAMPLE OF THE COLLECTED DATA SUMMARIES

Date and time from (dd/mm/yyyy; hh:mm UTC)	* Date and time to (dd/mm/yyyy; hh:mm UTC)	Distance travelled (nm)	Hours under way (hh:mm) **	Cargo carried (metric tons)	Cargo carried (TEU)	Cargo carried (Passenger)	(voluntary basis) Laden voyage (Y/N)	***exceptional conditions Specified in regulation 3.1 of MARPOL Annex VI (Y/N)	***Sailing in ice condition (Y/N)	***STS Operation (Y/N) …….	Fuel consumption (metric tons)			
											Main engine(s)			
											HFO****	LFO	MGO	etc.
01/01/2023 00:00	01/01/2023 13:20	150	13:20	1,500			Y	N	N	N				
……	……	……	……	…….				…….	…….	…….				
31/12/2023 00:00	31/12/2023 24:00	290	24:00	1,500			Y	N	N	N				
Annual Total														

(continued from the table above)

Fuel consumption (metric tons)																							
Auxiliary engine(s)				Boiler(s)				Others (Specify)				***mass to be deducted from the total											
												consumed for production of electrical power($FC_{electrical}$)				consumed by oil-fired boiler for cargo heating/discharge on tankers (FC_{boiler})				consumed by stand-alone engine driven cargo pumps during discharge operations on tankers(FC_{others})			
HFO	LFO	MGO	etc.	HFO	LFO	MGO	etc.	HFO	LFO	MGO	etc.	HFO	LFO	MGO	etc.	HFO	LFO	MGO	etc.	HFO	LFO	MGO	etc.

* In the case of daily underlying data, this column would be left blank.

** Hours under way should be equal to the time between the start and end date and time. In case the segment is not under way, it should be left blank.

*** Refer to the *2022 Interim guidelines on correction factors and voyage adjustments for CII calculations (G5)*, adopted by resolution MEPC.355(78). Supporting documentation may be additionally submitted to facilitate the verification when necessary, such as Baplie files where the number of in-use reefer containers on board are recorded. Note that voyages in different sailing or operational conditions should be recorded in separate rows so that the correction factors and voyage adjustments can be duly calculated and verified.

**** Refer to fuel types specified in the *2022 Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships* (resolution MEPC.364(79), as may be amended)

Explanatory remarks: If bunker supply/correction data have been recorded in a company's electronic reporting system, the data is acceptable to be submitted in the existing format instead of submitting the data by this format.

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ANNEX 8

RESOLUTION MEPC.390(81)
(adopted on 22 March 2024)

AMENDMENTS TO THE 2021 GUIDELINES ON THE SHAFT / ENGINE POWER LIMITATION SYSTEM TO COMPLY WITH THE EEXI REQUIREMENTS AND USE OF A POWER RESERVE (RESOLUTION MEPC.335(76)), AS AMENDED BY RESOLUTION MEPC.375(80))

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 that the 2021 Revised MARPOL Annex VI, which entered into force on 1 November 2022, contains requirements concerning mandatory goal-based technical and operational measures to reduce carbon intensity of international shipping,

NOTING ALSO that ships may be equipped with a shaft / engine power limitation system in order to comply with regulation 25 of MARPOL Annex VI on the 'Required EEXI',

NOTING FURTHER that, at its seventy-sixth session, it adopted, by resolution MEPC.335(76), the *2021 Guidelines on the shaft/engine power limitation system to comply with the EEXI requirements and use of a power reserve*,

NOTING that, at its eightieth session, the Committee adopted, by resolution MEPC.375(80), amendments to the *2021 Guidelines on the shaft/engine power limitation system to comply with the EEXI requirements and use of a power reserve*.

HAVING CONSIDERED, at its eighty-first session, proposed amendments to the *2021 Guidelines on the shaft/engine power limitation system to comply with the EEXI requirements and use of a power reserve*,

1 ADOPTS amendments to the *2021 Guidelines on the shaft/engine power limitation system to comply with the EEXI requirements and use of a power reserve*, the text of which is set out in the annex to the present resolution;

2 REQUESTS the Parties to MARPOL Annex VI and other Member Governments to bring the annexed amendments to the attention of masters, seafarers, shipowners, ship operators and any other interested parties.

ANNEX

AMENDMENTS TO THE 2021 GUIDELINES ON THE SHAFT / ENGINE POWER LIMITATION SYSTEM TO COMPLY WITH THE EEXI REQUIREMENTS AND USE OF A POWER RESERVE (RESOLUTION MEPC.335(76)), AS AMENDED BY RESOLUTION MEPC.375(80))

1 Paragraph 2.1.1.3 is replaced by the following:

".3 a control unit for calculation and limitation of the power transmitted by the shaft to the propeller(s); if this control unit is independent from the engine automation the following should be satisfied:

.1 override of limitation is indicated by giving an alarm on the bridge, clearly informing the ship's master or OICNW. Acceptance of this alarm by the master or OICNW is the deliberate action referred to in paragraph 2.2.1;

.2 in case of exceedance, the ship's master or OICNW to manually reduce the power within the limit;

.3 in case of deliberate use of power reserve, data recording to commence automatically;

.4 data recording device as defined in section 2.1.1.2; and

.5 in case of short-term unintentional exceedance of the power limit the system may inhibit the initiation of the exceedance alarm for up to a maximum of five (5) minutes."

2 Paragraph 2.2.1 is replaced by the following:

"2.2.1 The SHaPoLi / EPL system should be non-permanent but should require the deliberate action of the ship's master or OICNW to enable the use of unlimited shaft / engine power (power reserve) of the ship. For systems that use a Password/PIN to control access to the power reserve override, attention should be paid to ensure that the necessary Password/PIN is always available when override is required. In a scenario specified in regulation 3.1 of MARPOL Annex VI, which may endanger safe navigation of the ship, immediate use may be achieved by procedural arrangements for pre-emptive un-limiting the SHaPoLi/EPL system."

3 Paragraph 3.3 is replaced by the following:

"3.3 The use of the power reserve should be distinguished from the precautionary un-limiting of a shaft or engine power limitation system. Where an EPL/ShaPoLi override is activated pre-emptively when hazards are anticipated, but the power reserve is not subsequently used, this event should be recorded in the bridge and engine-room logbooks. The engine-room logbook should record power used during the period when the override was activated. The EPL/ShaPoLi should be reset as soon as possible, and details of the reset should also be recorded in the bridge and engine-room logbooks."

4 A new section 6 is added, after existing section 5, as follows:

"**6 Additional information to be provided, as applicable**

The following documents described in the appendices to *Recommendation on the Provision and Display of Manoeuvring Information on Board Ships* (annex, resolution A.601(15)) should be updated to include the manoeuvring characteristics of the ship when the ship has all shaft and engine power available, and when shaft or engine power has been limited:

.1 the Pilot card;

.2 the wheelhouse poster; and

.3 the manoeuvring booklet."

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ANNEX 9

**UNIFIED INTERPRETATIONS TO MARPOL ANNEX VI
(REGULATIONS 2.2.15 AND 2.2.18)**

NOTE: A new section containing the unified interpretation to regulation 2.2.15, as set out below, will be included in the next revision of MEPC.1/Circ.795 (i.e. MEPC.1/Circ.795/Rev.9).

Heavy load carrier

Regulation 2
Definitions

Regulation 2.2.15 reads as follows:

> "*General cargo ship* means a ship with a multi-deck or single deck hull designed primarily for the carriage of general cargo. This definition excludes specialized dry cargo ships, which are not included in the calculation of reference lines for general cargo ships, namely livestock carrier, barge carrier, heavy load carrier, yacht carrier, nuclear fuel carrier."

Interpretation:

1 The following are considered as a "heavy load carrier":

.1 Heavy load deck carriers*;

.2 Semi-submersible project cargo carriers;

.3 Semi-submersible heavy load deck carriers (including dock lift ships)

.4 Heavy lift multipurpose ships (see paragraph 4.2 below);

.5 Premium project carriers (see paragraph 4.2 below); and

.6 Project cargo carriers (see paragraph 4.3 below).

2 Heavy lift multipurpose ships and premium project carriers should fulfil the adapted criterion of "ships engaged in lifting operations" contained in regulation 2.3 of the 2008 International Code on Intact Stability (IS Code) as amended by resolution MSC.443(99)), and comply as follows:

$$\text{SWL} \times \text{Outreach} \geq 0.67 \times \text{Displacement} \times (D - T) / B$$

Where:

SWL = maximum safe working load of crane of one single crane;

Outreach = outreach from turning axis of crane;

* Ships, which do not feature a cargo hold and carry project cargo on a flat deck; not fitted with cargo coamings / chutes / tippers.

Displacement = displacement of vessel at draft *T*;

T = freeboard draft;

B = the moulded breadth of the vessel measured amidships at draft *T*;

D = depth for freeboard.

3 For project cargo carriers with or without cargo gear, the Administration may base its decision on a design and operation-specific application compiled by the owner/company.

NOTE: The section in MEPC.1/Circ.795/Rev.8 containing the unified interpretation to regulation 2.2.18 will be replaced by the text set out below in the next revision of the circular (i.e. MEPC.1/Circ.795/Rev.9).

Definition of "new ship"

Regulation 2
Definitions

Regulation 2.2.18 reads as follows:

"*New ship* means a ship:

.1 for which the building contract is placed on or after 1 January 2013; or

.2 in the absence of a building contract, the keel of which is laid or which is at a similar stage of construction on or after 1 July 2013; or

.3 the delivery of which is on or after 1 July 2015."

Interpretation:

1 For the application of the definition "new ship" as specified in regulation 2.2.18 to each Phase specified in table 1 of regulation 24, it should be interpreted as follows:

.1 the date specified in regulation 2.2.18.1 should be replaced with the start date of each Phase;

.2 the date specified in regulation 2.2.18.2 should be replaced with the date six months after the start date and end date of each Phase; and

.3 the date specified in regulation 2.2.18.3 should, for Phases 1, 2 and 3, be replaced with the date 48 months after the start date and end date of each Phase.

2 With the above interpretations, the required EEDI of each phase is applied to the following new ship to which chapter 4 is applicable:

.1 the required EEDI of Phase 0 is applied to the following new ship which falls into one of the categories defined in regulations 2.2.5, 2.2.7, 2.2.9, 2.2.14, 2.2.15, 2.2.22 and 2.2.29:

.1 the building contract of which is placed in Phase 0, and the delivery is before 1 January 2019; or

.2 the building contract of which is placed before Phase 0, and the delivery is on or after 1 July 2015 and before 1 January 2019; or

in the absence of a building contract:

.3 the keel of which is laid or which is at a similar stage of construction on or after 1 July 2013 and before 1 July 2015, and the delivery is before 1 January 2019; or

.4 the keel of which is laid or which is at a similar stage of construction before 1 July 2013, and the delivery is on or after 1 July 2015 and before 1 January 2019;

.2 the required EEDI of Phase 1 is applied to the following new ship which falls into one of the categories defined in regulations 2.2.5, 2.2.7, 2.2.9, 2.2.11, 2.2.14 to 2.2.16, 2.2.22, 2.2.26 to 2.2.29:

.1 for ship types where Phase 1 commences on 1 January 2015:

.1 the building contract of which is placed in Phase 1, and the delivery is before 1 January 2024; or

.2 the building contract of which is placed before Phase 1, and the delivery is on or after 1 January 2019 and before 1 January 2024; or

in the absence of a building contract:

.3 the keel of which is laid or which is at a similar stage of construction on or after 1 July 2015 and before 1 July 2020, and the delivery is before 1 January 2024; or

.4 the keel of which is laid or which is at a similar stage of construction before 1 July 2015, and the delivery is on or after 1 January 2019 and before 1 January 2024;

.2 for ship types where Phase 1 commences on 1 September 2015:

.1 the building contract of which is placed in Phase 1, and the delivery is before 1 January 2024; or

.2 the building contract of which is placed before Phase 1, and the delivery is on or after 1 September 2019 and before 1 January 2024; or

in the absence of a building contract:

.3 the keel of which is laid or which is at a similar stage of construction on or after 1 March 2016 and before 1 July 2020, and the delivery is before 1 January 2024; or

.4 the keel of which is laid or which is at a similar stage of construction before 1 March 2016, and the delivery is on or after 1 September 2019 and before 1 January 2024;

.3 the required EEDI of Phase 2 is applied to the following new ship which falls into one of the categories defined in regulations 2.2.5, 2.2.7, 2.2.9, 2.2.11, 2.2.14 to 2.2.16, 2.2.22, 2.2.26 to 2.2.29:

.1 for ship types where Phase 2 ends on 31 March 2022:

.1 the building contract of which is placed in Phase 2, and the delivery is before 1 April 2026; or

.2 the building contract of which is placed before Phase 2, and the delivery is on or after 1 January 2024 and before 1 April 2026; or

in the absence of a building contract:

.3 the keel of which is laid or which is at a similar stage of construction on or after 1 July 2020 and before 1 October 2022, and the delivery is before 1 April 2026; or

.4 the keel of which is laid or which is at a similar stage of construction before 1 July 2020, and the delivery is on or after 1 January 2024 and before 1 April 2026;

.2 for ship types where Phase 2 ends on 31 December 2024:

.1 the building contract of which is placed in Phase 2, and the delivery is before 1 January 2029; or

.2 the building contract of which is placed before Phase 2, and the delivery is on or after 1 January 2024 and before 1 January 2029; or

in the absence of a building contract:

.3 the keel of which is laid or which is at a similar stage of construction on or after 1 July 2020 and before 1 July 2025, and the delivery is before 1 January 2029; or

.4 the keel of which is laid or which is at a similar stage of construction before 1 July 2020, and the delivery is on or after 1 January 2024 and before 1 January 2029;

.4 the required EEDI of Phase 3 is applied to the following new ship which falls into one of the categories defined in regulations 2.2.5, 2.2.7, 2.2.9, 2.2.11, 2.2.14 to 2.2.16, 2.2.22, 2.2.26 to 2.2.29:

.1 for ship types where Phase 3 commences with 1 April 2022 and onwards:

.1 the building contract of which is placed in Phase 3; or

.2 the building contract of which is placed before Phase 3, and the delivery is on or after 1 April 2026; or

in the absence of a building contract:

.3 the keel of which is laid or which is at a similar stage of construction on or after 1 October 2022; or

.4 the keel of which is laid or which is at a similar stage of construction before 1 October 2022 and the delivery of which is on or after 1 April 2026;

.2 for ship types where Phase 3 commences with 1 January 2025 and onwards:

.1 the building contract of which is placed in Phase 3; or

.2 the building contract of which is placed before Phase 3, and the delivery is on or after 1 January 2029; or

in the absence of a building contract:

.3 the keel of which is laid or which is at a similar stage of construction on or after 1 July 2025; or

.4 the keel of which is laid or which is at a similar stage of construction before 1 July 2025 and the delivery of which is on or after 1 January 2029.

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ANNEX 10

RESOLUTION MEPC.391(81)
(adopted on 22 March 2024)

2024 GUIDELINES ON LIFE CYCLE GHG INTENSITY OF MARINE FUELS
(2024 LCA GUIDELINES)

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, at its eightieth session, it adopted, by resolution MEPC.377(80), the *2023 IMO Strategy on Reduction of GHG Emissions from Ships* (2023 IMO GHG Strategy) setting out the levels of ambition for the international shipping sector in reducing GHG emissions,

RECALLING FURTHER that, at its eightieth session, it also adopted, by resolution MEPC.376(80), *Guidelines on life cycle GHG intensity of marine fuels* (LCA Guidelines);

NOTING that the 2023 IMO GHG Strategy provides that the levels of ambition and indicative checkpoints set out therein should take into account the well-to-wake GHG emissions of marine fuels as addressed in the LCA Guidelines,

NOTING ALSO that the 2023 IMO GHG Strategy provides that the basket of candidate mid-term GHG reduction measures should take into account the well-to-wake GHG emissions of marine fuels as addressed in the LCA Guidelines,

HAVING CONSIDERED, at its eighty-first session, draft 2024 Guidelines on life cycle GHG intensity of marine fuels,

1 ADOPTS the *2024 Guidelines on life cycle GHG intensity of marine fuels (2024 LCA Guidelines)*, as set out in the annex to the present resolution;

2 AGREES that any regulatory application and implications of the 2024 LCA Guidelines should be determined by the Committee in the process of developing regulatory provisions,

3 REQUESTS Member Governments to bring the annexed Guidelines to the attention of shipowners, ship operators, shipbuilders, ship designers, energy companies, fuel producers, bunkering companies, engine manufacturers and any other interested parties;

4 AGREES to keep these Guidelines under review in light of experience gained with their implementation;

5 REVOKES the LCA Guidelines adopted by resolution MEPC.376(80).

2024 GUIDELINES ON LIFE CYCLE GHG INTENSITY OF MARINE FUELS (2024 LCA Guidelines)

CONTENTS

PART I: GENERAL

1 INTRODUCTION

These Guidelines provide guidance on life cycle GHG intensity assessment for all fuels and other energy carriers (e.g. electricity) used on board a ship and aim at covering the whole fuel life cycle (with specific boundaries), from feedstock extraction/cultivation/ recovery, feedstock conversion to a fuel product, transportation as well as distribution/bunkering, and fuel utilization on board a ship. These Guidelines also specify sustainability themes/aspects for marine fuels and define a Fuel Lifecycle Label (FLL), which carries information about fuel type, feedstock (feedstock type and feedstock nature/carbon source), conversion/production process (process type and energy used in the process), GHG emission factors, information on fuel blends and sustainability themes/aspects. These Guidelines specify the elements of FLL subject to verification/certification and include a general procedure on how the certification scheme/standards could be identified.

2 SCOPE

2.1 The scope of these Guidelines is to address well-to-tank (WtT), tank-to wake (TtW), and well-to-wake (WtW) GHG intensity and sustainability themes/aspects related to marine fuels/energy carriers (e.g. electricity for shore power) used for ship propulsion and power generation onboard. The relevant GHGs included are carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). These guidelines are not intended to provide guidance for a complete IMO GHG inventory for international shipping. Emissions from cargo (e.g. volatile organic compounds (VOC)), or use of refrigerants are not included; other short-lived climate forcers and precursors such as non-methane volatile organic compounds (NMVOC), sulphur oxides (SO_x), carbon monoxide (CO), particulate matter (PM) and Black Carbon are not part of the scope of these LCA guidelines.

2.2 The system boundaries of the WtW GHG emission factors calculation, in the context of these guidelines span the life cycle of fuels from their sourcing to production, conversion, transport, distribution, and eventually their use on board ships based on an attributional approach.[1] The possibility to expand the system boundaries for specific pathways in which the feedstock is displaced from present use(s) will be assessed on a case-by-case basis.[2] As such, emissions associated with the following life cycle stages of the fuel life cycle chain will be accounted for:

.1 feedstock extraction/cultivation/acquisition/recovery;

.2 feedstock (early) processing/ transformation at source;

.3 feedstock transport to conversion site;

.4 feedstock conversion to product fuel;

.5 product fuel transport/storage/delivery/retail storage/bunkering; and

.6 fuel utilization on board a ship.

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1 Attributional Life Cycle Assessment (LCA): LCA aiming to describe the environmentally relevant physical flows to and from a system and its subsystems over their life cycle; Consequential Life cycle Analysis (LCA): LCA aiming to describe how environmentally relevant flows will change in response to possible decisions. (Finnveden G, Hauschild MZ, Ekvall T, Guinée J, Heijungs R, Hellweg S, et al. "Recent developments in life cycle assessment". *Journal of Environmental Management*. 2009;91(1):1-21).

2 Such as for captured CO_2 transportation and storage.

2.3 Consistent with the attributional approach and using best available scientific evidence, the WtT emissions calculations (i.e. emissions related to the fuel sourcing, production, conversion, transport and delivery) are assessed regardless of the final use of fuels/energy carriers, and the TtW emissions (i.e. emissions related to the fuel use) are quantified regardless of the sourcing/production/conversion/transport and delivery steps of the fuel/energy carrier. WtW emissions are given by the sum of the two parts, providing the full emission performance associated with the fuel production and use of a certain fuel/energy in a specific converter onboard.

2.4 The GHG emissions are calculated as CO_2-equivalent (CO_{2eq}), using the global warming potential over a 100-year time-horizon (GWP100) to convert emissions of other gases than CO_2, as given in the fifth IPCC Assessment Report,[3] for CO_2, CH_4 and N_2O, as follows:

- $g_{CO_{2eq}(100y)} = GWP_{CO_2(100y)} \times g_{CO_2} + GWP_{CH_4(100y)} \times g_{CH_4} + GWP_{N_2O\,(100y)} \times g_{N_2O}$

(CO_2 1; CH_4 28; N_2O 265), this would read as:

- $g_{CO_{2eq}(100y)} = 1 \times gCO_2 + 28 \times gCH_4 + 265 \times gN_2O)$

These GWP100 values should be used for the purpose of quantifying the GHG intensity in accordance with these guidelines.

A calculation using a global warming potential over a 20-year horizon (GWP20) may be provided as information for comparative purposes, as follows:

- $g_{CO_{2eq}(20y)} = GWP_{CO_2(20y)} \times g_{CO_2} + GWP_{CH_4(20y)} \times g_{CH_4} + GWP_{N_2O\,(20y)} \times g_{N_2O}$

(CO_2 1; CH_4 84; N_2O 264), this would read as:

- $g_{CO_{2eq}(20y)} = 1 \times gCO_2 + 84 \times gCH_4 + 264 \times gN_2O$

2.5 These Guidelines provide:

.1 WtW GHG emission factors based on a life cycle attributional methodology, expressing the GHG profile of each representative fuel using on global warming potential (GWP) values over a 100-year time-horizon of included GHG (CO_2, CH_4 and N_2O);

.2 WtT GHG emission factors (CO_2, CH_4 and N_2O) quantified consistently with the attributional approach;

.3 TtW GHG emission factors (CO_2, CH_4 and N_2O); and

.4 sustainability themes/aspects for marine fuels.

[3] The global warming potential values as given in the *IPCC Fifth Assessment Report* (AR5) are used in the context of these Guidelines.

2.6 These Guidelines define a FLL that carries information about fuel type, feedstock used, fuel production pathway, GHG emission factors, information on fuel blends and sustainability themes/aspects.

2.7 The figure below shows a generic WtW supply chain for a fuel. The bunkering marks the last step in the WtT phase before the TtW phase starts.

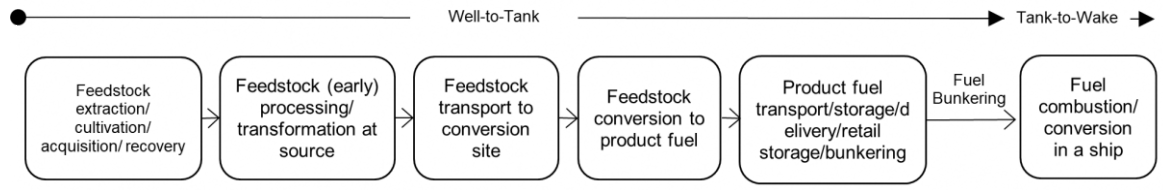

Figure 1: Generic well-to-wake supply chain

2.8 These Guidelines include an initial non-exhaustive list of fuels in appendix 1, depicting the main current and expected future marine fuels.

PART II: METHODOLOGY

3 GENERAL APPROACH

3.1 A life cycle assessment (LCA) based approach provides a holistic assessment of the product/service/system from well-to-wake using data specific to the activity considered. The LCA methodology follows the marine fuel from feedstock sourcing to its utilization onboard ships and assesses its life cycle GHG intensity. This approach, applied within the boundaries of the WtW GHG emissions quantification, is applicable across all geographical regions, where emissions occur and allows for quantifying the GHG intensity over the entire fuel/energy supply chain.

3.2 General principles and methodology can be found in ISO 14044:2006 *Environmental management — Lifecycle assessment — Requirements and guidelines*. ISO 14040:2006 *Environmental management — Lifecycle assessment — Principles and framework* sets the framework for the LCA, for the quantification of the environmental impact of products, processes and services in the supply chain. On this basis, a specific LCA methodology can be tailored for its application to marine fuels.

3.3 WtT emissions represent GHG emissions resulting from growing or extracting raw materials, producing and transporting the fuel up to the point of use, including bunkering.

3.4 TtW emissions represent GHG emissions resulting from fuel utilization onboard (e.g. combustion), including potential leaks (fugitive emissions and slip), when relevant for the GHG assessment.

3.5 WtW emissions are the sum of the WtT and TtW emissions and quantify the full life cycle GHG emissions for a given fuel and fuel pathway, used in a given energy converter on board.

3.6 The attributional approach considers all processes along the supply chain of fuel/energy carrier pathways, allowing the quantification of contributions per segment to the overall GHG intensity of the final fuel/energy product used on board a ship. The expansion of the system boundaries for specific pathways, in which the feedstock or intermediate products are diverted from existing use(s), may be considered on a case-by-case basis.

3.7 As regards the expansion of the system boundaries, with consequential elements such as Indirect Land Usage Change (ILUC), concerns with respect to uncertainties and the risk of arbitrariness suggest that the feedstocks with associated ILUC should only be assessed through a risk-based approach, in the framework of sustainability themes/aspects, as part of these guidelines.

3.8 When more than one product results from a conversion process, emissions related to the fuel production should be allocated between main product and co-products. Within such conversion processes, emissions are allocated using their energy content, the so-called "energy allocation" approach. Where co-products allocation cannot be performed based on their energy content (e.g. Oxygen resulting from water electrolysis for H_2 production), other methods such as mass allocation, market revenue allocation (also known as "economic allocation"), could be considered on a case-by-case basis.

3.9 A *co-product* is defined as "an outcome of a production process, which has economic value and elastic supply (intended as the existence of a clear evidence of the causal link between feedstock market value and the quantity of feedstock that can be produced)".

3.10 This definition applies also when a raw material used to produce the fuels is a waste (no economic value) or a residue (unavoidably produced and with negligible economic value, needing further processing to be used in the main conversion process). In case the feedstock is a waste, a residue or a by-product, emissions considered as WtT start at the feedstock collection point onwards until the point of use of the final fuel/energy product.

3.11 According to the *IPCC Guidelines for National Greenhouse Gas Inventories* (IPCC Guidelines)[4], any carbon in the fuel derived from biomass should be reported as an information item and not included in the sectoral or national totals to avoid double counting, since the net emissions from biomass are already accounted for in the Agriculture Forestry and Other Land Use (AFOLU) sector at a national level.

3.12 The scope of the IMO LCA Guidelines does not affect or change the IPCC Guidelines. According to the IPCC Guidelines, international waterborne navigation (international bunkers) is grouped under "Mobile combustion" under the Energy sector, but emissions from fuel used by ships in international transport should not be included in national totals in national GHG inventories.

3.13 A fuel batch may be a mix of fuels made from various feedstocks and sources (e.g. by blending 20% biodiesel into fossil MGO) and/or through different production pathways. The calculation should be done using the weighted averages of the energy of the various fuel components. Relevant information should accompany each component fuel in the FLL. Blended fuels should be included in the certification schemes and relevant GHG default or actual emission factors (gCO_2/MJ) determined in proportion to the energy of each fuel part of the blend.

4 WELL-TO-TANK (WtT)

4.1 The pathway of each relevant marine fuel should be clearly described and the GHG emissions during each step of the fuel pathway should be calculated. Specific GHG emissions of a specific non-conventional and non-fossil fuel's pathway may take into account different characteristics across geographic regions, where feedstock production and/or conversion occurs, as appropriate.

[4] *2006 IPCC Guidelines for National Greenhouse Gas Inventories.*

4.2 Any further reference in this document to a "fuel pathway" should be understood to include the feedstock structure (the so-called nature/carbon source and feedstock type pair) and the production or conversion process (noting that the same feedstock and fuel type pair can have a different production or conversion process).

4.3 The aim of the WtT methodology is to quantify and evaluate the GHG intensity of fuel production, including all steps mentioned in figure 2. The carbon feedstock and production pathway of a fuel should be identified in order to apply the methodology and is included as part of the FLL. The production steps to be included in the WtT are presented in figure 2.

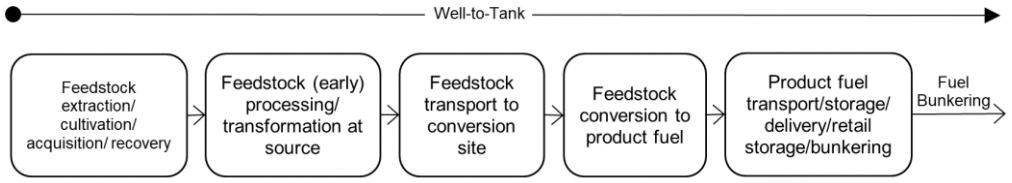

Figure 2: Generic well-to-tank supply chain

4.4 The WtT GHG emission factor ($gCO_{2eq}/MJ_{(LCV)}$ fuel or electricity) is calculated according to Equation (1).

Equation (1)

$$GHG_{WtT} = e_{fecu} + e_l + e_p + e_{td} - e_{sca} - e_{ccs}$$

Term	Units	Explanation
e_{fecu}	gCO_{2eq} / $MJ_{(LCV)}$	Emissions associated with the feedstock extraction/cultivation/acquisition/recovery
e_l	gCO_{2eq} / $MJ_{(LCV)}$	Emissions (annualized emissions (over 20 years) from carbon stock changes caused by direct land-use change)[5]
e_p	gCO_{2eq} / $MJ_{(LCV)}$	Emissions associated with the feedstock processing and/or transformation at source and emissions associated with the conversion of the feedstock to the final fuel product, including electricity generation
e_{td}	gCO_{2eq} / $MJ_{(LCV)}$	Emissions associated with the feedstock transport to conversion plant, and the emissions associated with the finished fuel transport and storage, local delivery, retail storage and bunkering
e_{sca}	gCO_{2eq} / $MJ_{(LCV)}$	Emissions (annualized emission savings (over 20 years) from soil carbon accumulation via improved agricultural management)[6]
e_{ccs}	gCO_{2eq} / $MJ_{(LCV)}$	Emissions credit from carbon capture and storage (e_{ccs}), that have not already been accounted for in e_p. This should properly account the avoided emissions through the capture and sequestration of emitted CO_2, related to the extraction, transport, processing and distribution of fuel (c_{sc}). From the

5 Pending further methodological guidance to be developed by the Organization, the value of parameter e_l should be set to zero.

6 Pending further methodological guidance to be developed by the Organization, the value of parameter e_{sca} should be set to zero.

Term	Units	Explanation
		above-mentioned emission credit, all the emissions resulting from the process of capturing (e_{cc}) and transporting (e_t) the CO_2 up to the final storage (including the emissions related to the injection, etc.) need to be deducted. This element should be calculated with the following formula: $$e_{CCS} = c_{SC} - e_{cc} - e_t - e_{st} - e_x$$
c_{sc}	g CO_2 stored / $MJ_{(LCV)}$	Emissions credit equivalent to the net CO_2 captured and stored (long-term: 100 years)
e_{cc}	gCO_{2eq} / $MJ_{(LCV)}$	Emissions associated with the process of capturing, compression and/or cooling and temporary storage of the CO_2
e_t	gCO_{2eq} / $MJ_{(LCV)}$	Emissions associated with transport to a long-term storage site
e_{st}	gCO_{2eq} / $MJ_{(LCV)}$	Any emissions associated with the process of storing (long-term: 100 years) the captured CO_2 (including fugitive emissions that may happen during long-term storage and/or the injection of CO_2 into the storage)
e_x	gCO_{2eq} / $MJ_{(LCV)}$	Any additional emissions related to the CCS

4.5 The WtT emissions in Equation (1) include emissions associated with raw materials extraction or cultivation, primary energy sources used for production of goods and utilities such as energy carriers (e.g. fuels and electricity), transport and distribution (including bunkering), direct land use change and changes in carbon stocks (soil carbon accumulation).

4.6 Processing incorporates all steps and operations needed for the extraction, capture or cultivation of the primary energy source. Process includes basic transformation at source and operations needed to make the resource transportable to the marketplace (e.g. drying, chemical/physical upgrade such as gas-to-liquid, etc.).

4.7 Transportation, processing and distribution include transportation of the products in the fuel pathway to the place of transformation, conditioning (such as compression, cooling), distribution to the marketplace (i.e. bunkering) and eventual leakages, as well as fugitive emissions at any of these stages. Regarding emissions from bunkering, it is included till the bunker manifold, including emission from the bunker manifold connection.

4.8 Allocation of emissions to co-products based on their energy content should be used, as the most appropriate and reliable methodology considering the establishment of an appropriate certification method using values that are predictable, reproducible and stable.

4.9 Land use (direct and indirect) for the production of biofuels may lead to land use change (LUC). LUC can be classified as direct LUC (DLUC) and indirect LUC (ILUC).

4.10 The DLUC definition is based on ISO 14067:2018 described as a change in the use or management of land within the product system being assessed. The DLUC impacts comprises the emissions and sequestration resulting from carbon stock changes in biomass, dead organic matter and soil organic matters, evaluated in accordance with the IPCC Guidelines. When available, sector or country-specific data on carbon stocks may be used; otherwise, IPCC's Tier 1 default emission factors may be considered. Two terms in the WtT Equation (1) capture respectively emissions resulting from direct land use change, i.e. e_l, and sequestration or otherwise increase in the content of soil organic carbon: e_{sca}.

4.11 The ILUC definition is based on ISO 14067:2018, described as a change in the use or management of land, which is a consequence of direct land use change, but which occurs outside the product system being assessed. ILUC occurs as a result of the economic impacts induced by increased biofuel demand on commodity prices with resulting shifts in demand and supply across economic sectors, including primarily food and feed production. ILUC cannot be directly measured and is projected with economic models instead.

4.12 Owing to the variability of assumptions underlying the evaluation of indirect effects, quantitative assessment of GHG effects of ILUC is subject to uncertainty, high quantitative variability and to the risk of arbitrary conclusions. For these reasons, ILUC should be at this stage addressed using a risk-based approach, meaning that quantitative values will not be calculated and assigned to each fuel pathway. The ILUC emissions, as well as the spatial dimension of the ILUC effects, are dependent on a variety of factors such as local/regional conditions and practices for agriculture, current and expected food import demand, national current accounts, the type of feedstock, the alternative economic uses of the same feedstock, etc.

4.13 A qualitative risk-based approach to ILUC includes consideration on the following:

.1 *Low-ILUC risk* qualifies and characterizes biofuel production projects that supply additional feedstock without disrupting existing land uses. When productivity is increased on an area which is in agricultural production, only additional yields should be considered as low-ILUC rather than the entire production; and

.2 *High-ILUC risk* qualifies and characterizes biofuel production projects based on, or displacing, food and feed crops resulting in a significant expansion of the feedstock production area shifting into land with high carbon stock.

4.14 WtT default emission factors are provided in appendix 2 of these guidelines.

5 TANK-TO-WAKE (TtW)

5.1 The aim of the TtW methodology is to quantify and evaluate the intensity of CO_2, CH_4 and N_2O emitted on board a ship related to the fuel usage, including combustion/conversion and all relevant fugitive emissions, from the bunker manifold up to the energy converter which is leaked, vented or otherwise lost in the system, with a global warming potential.

5.2 The TtW GHG emission factors should be calculated using Equation (2):

Equation (2)

$$GHG_{TtW} = \frac{1}{LCV}\left(\begin{array}{c}\left(1 - \frac{1}{100}\left(C_{slip\_ship} + \mathrm{C}_{fug}\right)\right) \times \left(C_{fCO_2} \times GWP_{CO_2} + C_{fCH_4} \times GWP_{CH_4} + C_{fN_2O} \times GWP_{N_2O}\right) + \\ + \left(\frac{1}{100}\left(C_{slip\_ship} + \mathrm{C}_{fug}\right) \times C_{sfx} \times GWP_{fuelx}\right) - S_{Fc} \times e_c - S_{Fccu} \times e_{ccu} - e_{OCCS}\end{array}\right)$$

Note: *Terms S_{Fccu}, e_{ccu} and e_{occs} are pending further methodological guidance to be developed by the Organization. For more details refer to footnotes 11 to 13.*

Term	Units	Explanation
C_{slip_ship}	% of total fuel mass	Factor accounting for fuel (expressed in % of total fuel mass delivered to the ship) which escapes from the energy converter without being oxidized (including fuel that escapes from combustion chamber/oxidation process and from crankcase, as appropriate) $C_{slip\_ship} = C_{slip} * (1 - C_{fug}/100)$
C_{slip}	% of total fuel mass	Factor accounting for fuel (expressed in % of total fuel mass consumed in the energy converter) which escapes from the energy converter without being oxidized (including fuel that escapes from combustion chamber/oxidation process and from crankcase, as appropriate)
C_{fug}	% of fuel mass	Factor accounting for the fuel (expressed in % of mass of the fuel delivered to the ship) which escapes between the tanks up to the energy converter which is leaked, vented or otherwise lost in the system[7]
C_{sfx}	gGHG/g fuel	Factor accounting for the share of GHG in the components of the fuel (expressed in g GHG/g fuel) Example: for LNG this value is 1
C_{fCO2}	gCO_2/g fuel	CO_2 emission conversion factor (gCO_2/g fuel completely combusted) for emissions of the combustion and/or oxidation process of the fuel used by the ship
C_{fCH4}	gCH_4/g fuel	CH_4 emission conversion factor (gCH_4/g fuel delivered to the ship) for emissions of the combustion and/or oxidation process of the fuel used by the ship[8]
C_{fN2O}	gN_2O/g fuel	N_2O emission conversion factor (gN_2O/g fuel delivered to the ship) for emissions of the combustion and/or oxidation process of the fuel used by the ship
GWP_{CH4}	gCO_{2eq}/g CH_4	Global warming potential of CH_4 over 100 years (based on the fifth IPCC Assessment Report 5)[9] Definition as per https://www.ipcc.ch/assessment-report/ar5/
GWP_{N2O}	gCO_{2eq}/g N_2O	Global warming potential of N_2O over 100 years (based on the fifth IPCC Assessment Report 5).[10] Definition as per https://www.ipcc.ch/assessment-report/ar5/
GWP_{fuelx}	gCO_{2eq}/g GHG	Global warming potential of GHG in the components of the fuel over 100 years (based on the fifth IPCC scientific Assessment Report)
S_{Fc}	0 or 1	Carbon source factor to determine whether the emissions credits generated by biomass growth are accounted for in the calculation of the TtW value
e_c	gCO_{2eq}/g fuel	Emissions credits generated by biomass growth

[7] Pending further methodological guidance to be developed by the Organization to determine appropriate factor(s), the value of C_{fug} should be set to zero.

[8] For LNG/CNG fuel, the C_{slip_engine} is covering the role of C_{fCH4}, so C_{fCH4} is set to zero for these fuels.

[9] Set at 28 based on IPCC AR5.

[10] Set at 265 based on IPCC AR5.

$Term$	Units	Explanation
e_{ccu}[11]	gCO_{2eq}/g fuel	Emission credits from the used captured CO_2 as carbon stock to produce synthetic fuels in the fuel production process and utilization (that was not accounted under e_{fecu} and e_p)
S_{Fccu}[12]	0 or 1	Carbon source factor to determine whether the emissions credits from the used captured CO_2 as carbon stock to produce synthetic fuels in the fuel production process are accounted for in the calculation of the TtW value
e_{occs}[13]	gCO_{2eq} / g fuel	Emission credit from carbon capture and storage (e_{occs}), where capture of CO_2 occurs onboard. This should properly account for the emissions avoided through the capture and sequestration of emitted CO_2, if CCS occurs on board. From the above-mentioned emission credit, all the emissions resulting from the process of capturing (e_{cc}), and transporting (e_t) the CO_2 up to the final storage (including the emissions related to the injection, etc.) need to be deducted. This element should be calculated with the following formula: $$e_{OCCS} = c_{SC} - e_{cc} - e_t - e_{st} - e_x$$
c_{sc}	gCO_2 / g fuel	Credit equivalent to the CO_2 captured and stored (long-term: 100 years)
e_{cc}	gCO_{2eq} / g fuel	Any emission associated with the process of capturing, compress and temporarily store on board the CO_2
e_t	gCO_{2eq} / g fuel	Emissions associated with transport to long-term storage site
e_{st}	gCO_{2eq} / g fuel	Any emission associated with the process of storing (long-term: 100 years) the captured CO_2 (including fugitive emissions that may happen during long-term storage and/or the injection of CO_2 into the storage)
e_x	gCO_{2eq} / g fuel	Any additional emission related to the CCS
LCV	MJ/g	Lower Calorific Value is the amount of heat that would be released by the complete combustion of a specified fuel

5.3 In order to have LCA guidelines that will allow for their clear, robust and consistent application to any possible measure, the methodology allows to calculate two TtW values as follows:

.1 TtW GHG intensity value 1: calculated regardless of the carbon source, therefore the e_c and e_{ccu} parameters should not be taken into account and the S_{Fc} and S_{Fccu} value should be always 0; and

.2 TtW GHG intensity value 2: calculated taking into account the carbon source for fuels of biogenic origins or made from captured carbon, therefore the e_c and e_{ccu} parameters should be taken into account and the S_{Fc} and S_{Fccu} values should be always 1.

11 Pending further methodological guidance to be developed by the Organization, the value of the multiplication $S_{Fccu} \times e_{ccu}$ should be set to zero.

12 Pending further methodological guidance to be developed by the Organization, the value of the multiplication $S_{Fccu} \times e_{ccu}$ should be set to zero.

13 Pending further methodological guidance to be developed by the Organization, the value of e_{occs} should be set to zero.

5.4 The actual GHG intensity depends both on the properties of the fuel and on the efficiency of the energy conversion. For CO_2, the emission factors are based on the molar ratio of carbon to oxygen multiplied with the carbon mass of the fuel, assuming that all the carbon in the fuel is oxidized (stoichiometric combustion). The CH_4 and N_2O emissions factors are dependent on the combustion and/or conversion process in the energy converter.

5.5 For future use of, for example, fuel cells with a reforming unit, also electro-chemical reactions forming GHGs can be taken into account by this TtW methodology.

5.6 TtW default emission factors are provided in appendix 2 of these guidelines.

6 WELL-TO-WAKE (WtW)

6.1 The aim of the WtW methodology is to integrate WtT and TtW parts, to quantify the full life cycle emissions related to the production and use of a fuel.

6.2 The WtW GHG emission factor (gCO_{2eq}/MJ_{LCV} fuel or electricity) is calculated as follows:

Equation (3)

$$GHG_{WtW} = GHG_{WtT} + GHG_{TtW}$$

where:

Term	Units	Explanation
GHG_{WtW}	$gCO_{2eq}/MJ_{(LCV)}$	Total well-to-wake GHG emissions per energy unit from the use of the fuel or electricity in a consumer on board the ship
GHG_{WtT}	$gCO_{2eq}/MJ_{(LCV)}$	Total well-to-tank GHG upstream emissions per energy unit of the fuel provided to the ship
GHG_{TtW}	$gCO_{2eq}/MJ_{(LCV)}$	Total tank-to-wake GHG downstream emissions per energy unit from the use of the fuel or electricity in a consumer on board the ship

Equation (4)

$$GHG_{WtW} = e_{fecu} + e_l + e_p + e_{td} - e_{sca} - e_{ccs} + \frac{1}{LCV}\left(\begin{array}{l}\left(1 - \frac{1}{100}\left(C_{slip\_ship} + C_{fug}\right)\right) \times \left(C_{fCO_2} \times GWP_{CO_2} + C_{fCH_4} \times GWP_{CH_4} + C_{fN_2O} \times GWP_{N_2O}\right) + \\ \left(\frac{1}{100}\left(C_{slip_{ship}} + C_{fug}\right) \times C_{sfx} \times GWP_{fuelx}\right) - S_{Fc} \times e_c - S_{Fccu} \times e_{ccu} - e_{OCCS}\end{array}\right)$$

Note: terms S_{Fccu}, e_{ccu} and e_{occs} are pending further methodological guidance to be developed by the Organization. For more details refer to section 5.2.

6.3 For the purpose of calculating WtW, the TtW value 2 as calculated in accordance with paragraph 5.3.2 should be used.

7 SUSTAINABILITY

7.1 The sustainability of marine fuels should be assessed considering the following themes/aspects on a life cycle basis:

.1 greenhouse gases (GHG);
.2 carbon source;
.3 source of electricity/energy;
.4 carbon stock – direct land use change (DLUC);
.5 carbon stock – indirect land use change (ILUC);
.6 water;
.7 air;
.8 soil;
.9 waste and chemicals; and
.10 conservation.

Other social and economic sustainability themes/aspects may be considered at a later stage.

7.2 The principle/objective in conjunction with the associated metrics/indicators of each of the sustainability theme/aspect are specified below.

Table 1: Sustainability themes/aspects

Theme/aspect	Principle/Objective	Metric/Indicator
1. Greenhouse Gases (GHG)	Sustainable marine fuels generate lower GHG emissions than conventional marine fuels (energy-based weighted average of liquid petroleum products on 3 specific years of DCS data) on a life cycle basis.	1. GHG intensity in gCO_{2eq}/MJ (GWP100); and GHG intensity in gCO_{2eq}/MJ (GWP20) for comparative purposes.
2. Carbon source	Sustainable marine fuels do not increase GHG intensity from the use of fossil energy sources and the permanence of captured and stored carbon is ensured while also avoiding double counting across economic sectors.	1. Carbon source indicator, including its content (in %) and origin in feedstock used to produce final fuel product, i.e. Fossil, Biogenic, Captured Carbon (including direct air capture (DAC), point source fossil (PSF) and point source biogenic (PSB)), and Others (including mixture of sources).

Theme/aspect	Principle/Objective	Metric/Indicator
3. Source of electricity/energy	Sustainable marine fuels requiring significant electricity input during WtT phase and electricity delivered directly to ships are produced by using electricity/energy from renewable, nuclear or biogenic sources, which are additional to current or long-standing demand levels, or by using surplus electricity during off-peak hours.	1. The GHG intensity of electricity used in the production of marine fuels or delivered directly to ships (annual average, expressed in g CO_{2eq}/kWh based on total emissions and actual hours of production).
4. Carbon stock – direct land use change (DLUC)	Sustainable marine fuels are not made from biomass obtained from land with high carbon stock; production of sustainable marine fuels minimizes emissions resulting from Direct Land Use Change.	1. Sustainable marine fuel feedstock does not include biomass obtained from land with high carbon stock (e.g. primary forests, wetlands, or peat lands referred to a specific cut-off date for conversion), or a sustainable land management plan and reporting schedule are in place to ensure that the biomass is obtained from activities or ecosystem services that do not negatively impact the soil carbon stock; 2. The production of sustainable marine fuels does not occur in lands converted from primary forest, forestland, grassland or legally protected land, taking (1 January 2008)[14] as the cut-off date; and 3. Direct land-use change (DLUC) indicator, expressed in GHG (including CO_2, CH_4 and N_2O emissions) intensity, i.e. mass of CO_2 equivalent / MJ of production or yield of feedstock.

[14] Pending further guidance to be developed by the Organization.

Theme/aspect	Principle/Objective	Metric/Indicator
5. Carbon stock – indirect land use change (ILUC)	Cultivation of feedstock of sustainable marine fuels minimizes inducing negative changes in the use or management of land which occurs outside the product system being assessed.	1. Indirect carbon stock risk associated with cultivation of feedstock for sustainable marine fuels (see paragraph 4.13).
6. Water	Production of sustainable marine fuels maintain or enhance water quality and availability.	1. Operational practices are in place to (1) maintain water quality; and (2) use water efficiently and to avoid the depletion of water resources (including surface water, renewable water and fossil/underground water) beyond replenishment capacities; 2. Respect of decision-making of local population on water management; 3. Water environment impact (weighted water consumption on water scarcity); 4. Water Use Indicator expressed in m^3/year per MJ or production or yield of feedstock; 5. Freshwater eutrophication indicator, e.g. expressed in kg of phosphorus equivalent (P_{eq}) and kg of nitrogen equivalent (N_{eq}) released to fresh water/kg of feedstock produced or per MJ respectively; and 6. Marine eutrophication indicator, e.g. expressed in kg of phosphorus equivalent (P_{eq}) and kg of nitrogen equivalent (N_{eq}) released to marine water/kg of feedstock produced or per MJ respectively.
7. Air	Production of sustainable marine fuels minimizes negative impacts on air quality.	1. The marine fuel is made in a facility that fully complies with all local, national and regional air pollution laws and regulations.

Theme/aspect	Principle/Objective	Metric/Indicator
8. Soil	Production of sustainable marine fuels maintain or enhance soil health.	1. Agricultural and forestry best management practices for feedstock production or residue collection have been implemented to maintain or enhance soil health, such as physical, chemical and biological conditions; and 2. The marine fuel is made in a facility that fully complies with all local, national and regional laws and regulations about soil health.
9. Waste and chemicals	Production of sustainable marine fuels maintain or enhance responsible management of waste and use of chemicals.	1. Operational practices are implemented to ensure that waste arising from, and chemicals used in, production processes are minimized at storage, handling and disposal steps. Reuse or recycling of chemicals and waste is encouraged. 2. Procedures are in place to minimize the use of materials that are neither recyclable nor biodegradable; 3. Average (in tonnes) of hazardous wastes generated per MJ of fuel produced; and 4. Average (in tonnes) of specified industrial chemicals consumed per MJ of fuel produced.

Theme/aspect	Principle/Objective	Metric/Indicator
10. Conservation	Production of sustainable marine fuels maintain or enhance biodiversity and ecosystems, or conservation services.	1. The marine fuel is not made from feedstock obtained from areas that due to their biodiversity, conservation value, or ecosystem services, are protected by the State having jurisdiction over the area. Evidence is provided that the activity does not interfere with the protection purposes; and 2. Low invasive-risk feedstock is selected for cultivation and appropriate controls are adopted with the intention of preventing the uncontrolled spread of cultivated alien species and modified microorganisms.

8 FUEL LIFECYCLE LABEL (FLL)

8.1 The FLL is a technical tool to collect and convey the information relevant for the life cycle assessment of marine fuels and energy carriers (e.g. electricity for shore power) used for ship propulsion and power generation onboard in the context of these guidelines.

8.2 The FLL consists of five main parts, as illustrated below:

Part A-1	Part A-2	Part A-3	Part A-4	Part A-5
Fuel type (blend)	Fuel Pathway Code	Lower Calorific Value (LCV, MJ/g)	share in fuel blend (%$MJ_{(LCV)}$ / $MJ_{(LCV)}$)	WtT GHG emission factor (GWP100, $gCO_{2eq}/MJ_{(LCV)}$)

+

Part B-1	(Part B-2)[15]
Emissions credits related to biogenic carbon source (e_c, in gCO_2/g fuel based on GWP100)	Emissions credits related to source of captured carbon (e_{ccu}, in gCO_2/g fuel based on GWP100)

+

Part C-1	Part C-2	Part C-3
Value 1 (carbon source NOT taken into account): TtW GHG emission factor (GWP100, $gCO_{2eq}/MJ_{(LCV)}$)	Value 2 (carbon source taken into account): TtW GHG emission factor (GWP100, $gCO_{2eq}/MJ_{(LCV)}$)	Energy Converter

+

[15] Pending further methodological guidance to be developed by the Organization (see section 5).

Part D	Part E
WtW GHG emission factor (GWP100, $gCO_{2eq}/MJ_{(LCV)}$) Note: Part D = Part A-5 + Part C-2	Sustainability (Certification)[16]

8.3 Different parties (fuel suppliers, owners/operators, Administration/RO, etc.) may use different parts of the FLL for different purposes along the fuel pathway. As such, each interested party may use those parts of the FLL as relevant to their activities and purposes rather than the complete, integrated document.

8.4 The five main parts of the FLL are explained below.

.1 **Part A** of the FLL indicates:

.1 fuel type (Part A-1);

.2 fuel pathway code (Part A-2);

.3 lower calorific value (Part A-3, in MJ/g); and

.4 WtT GHG emission factor (Part A-5, in $gCO_{2eq}/MJ_{(LCV)}$ calculated on GWP100).

Part A-4 is only applicable when a fuel batch is supplied to the ship as a blend of fuels with different fuel pathway code (hereinafter referred to as the "fuel blend") and indicates the share of each blend component in the fuel blend (in $\%MJ_{(LCV)}/MJ_{(LCV)}$). If fuel blends are denoted on volume-basis, a re-calculation on energy basis based on the LCV values of the blend components is required;

For the fuel blend supplied to a ship, the information on fuel type for the mixture is presented under Part A-1 on top of its components, named by percentual order of composition in the fuel, e.g. X (70%), Y (20%), Z (10%). Part A-5, Part C-1, Part C-2 and Part D are the average value weighted on energy share ($\%\ MJ_{(LCV)}$) $/MJ_{(LCV)}$)) of each fuel component, while Part A-2 to A-4, Part B and Part E are kept blank. Each component of the fuel blend with a specific fuel pathways code is presented in a separate row below the row for the fuel blend;

.2 **Part B** of the FLL indicates the carbon credits related to the carbon source, including:

.1 e_c (Part B-1, in gCO_2 / g fuel calculated on GWP100); (and

.2 e_{ccu} (Part B-2, in gCO_2/g fuel calculated on GWP100)),[17]

as defined in section 5 of these Guidelines;

[16] Pending further guidance to be developed by the Organization.

[17] Pending further methodological guidance to be developed by the Organization. For more details on the e_{ccu} parameter and Part B-2 of the FLL, refer to sections 5.2 and 8.2, respectively.

.3 **Part C** of the FLL indicates the TtW GHG emission factor of the fuel type in conjunction with the energy converter(s) on board the ship (Part C-3). The TtW GHG emission factor of the fuel type is further categorized as:

.1 Value 1 where carbon source is not taken into account (Part C-1, in $gCO_{2eq}/MJ_{(LCV)}$ calculated on GWP100); and

.2 Value 2 where carbon source is taken into account (Part C-2, in $gCO_{2eq}/MJ_{(LCV)}$ calculated on GWP100),

as defined in section 5 of these Guidelines;

.4 **Part D** of the FLL indicates the WtW GHG emission factor of the fuel type (in $gCO_{2eq}/MJ_{(LCV)}$ calculated on GWP100), which is always the sum of Part A-5 and Part C-2; and

.5 **Part E** of the FLL indicates the sustainability performance of the fuel as per Section 7 of these Guidelines.

PART III: DEFAULT EMISSION FACTORS AND ACTUAL VALUES

9 DEFAULT EMISSION FACTORS

9.1 The principles and the procedure described for the determination of default emission factors under this section 9 have been used for the establishment of default emission factors and should remain valid for the factors that will be established.

9.2 WtT default emission factors should be calculated using representative and conservative assumptions, which encompass variable performance of feedstock-fuel pathways across world regions and States.

9.3 To establish a WtT default emission factor, at least three reference values from three different, representative, sources should be considered. Among the three (or more) values considered, the upper emission value should be selected as default, and the range of available emission factors should be provided for informative purposes. The reference values should be accompanied by the relevant technical and scientific information (see template set out in appendix 4) and evaluated against the corresponding information as appropriate, including the agreement between the reference values.

9.4 Emissions related to carbon stock changes caused by DLUC (e_l) and emissions savings from soil carbon accumulation via improved agricultural management (e_{sca}) are considered as zero for the establishment of the initial default emission factors. Similarly, this is the case also for the parameters related to carbon capture and storage (ccs), which require further development.

9.5 For the establishment of e_l, and following IPCC (2019) and ISO 14067:2018 recommendations, the operators should use the following Equation (5) for the determination of e_l[18], measured as mass (g) of CO_2eq per MJ of energy:

Equation (5): $$e_l = \left(\left(CS_{R,j} - CS_{A,j}\right) \times 3.664 + E_{nCO2,j}\right) \times \frac{1}{n \; x \; P}$$

[18] Economic operators are expected to discriminate land types at the appropriate level of detail.

The terms refer to:

$CS_{R,j}$ the carbon stock of the land type j per unit area associated with the reference land-use (measured as mass (g) of carbon per unit area (ha), including both soil and vegetation and dead organic matter). The reference land-use should be the land-use in January 2008 or 20 years before the raw material was obtained, whichever was the later;

$CS_{A,j}$ the carbon stock of the land type j per unit area associated with the actual land-use (measured as mass (g) of carbon per unit area (ha), including both soil and vegetation and dead organic matter). In cases where the carbon stock accumulates over more than one year, the value attributed to CS_A should be the estimated stock per unit area after 20 years or when the crop reaches maturity, whichever the earlier;

3.664 the quotient obtained by dividing the molecular weight of CO_2 (44,010g/mol) by the molecular weight of carbon (12,011g/mol) in gCO_2eq/g C;

n equal to 20, which corresponds to the number of years for amortization of the emissions in the IMO framework;

P the productivity of the crop (measured as MJ of energy per ha per year); and

E_{nCO2j} emission factor for non-CO_2 emissions from biomass burned (measured as gCO_2eq per unit area (ha)), accounted in the equation only if the necessary information on area burned is available. Details of the E_{nCO2j} formula should follow methodology to be defined.

9.6 According to existing standards, the CS_R and CS_A parameters have to be determined by means of direct measurements of soil carbon stocks, or calculated. CS_R and CS_A values, measured as mass (g) of carbon per unit area (ha), are obtained by considering:

$$CS_{R,j\ o\ A,j} = SOC_j + C_{veg,j}$$

9.7 Where C_{veg} is the above and below ground carbon stock of the vegetation, including dead organic matter, measured as mass (g) of carbon per unit area (ha), which shall follow IPCC Guidelines. *SOC* parameter is the amount of soil organic carbon (measured as mass (g) of carbon per unit area (ha)) and consists of four factors, which depend on climate, soil type, management practice and C-input practice: the standard soil organic carbon in the topsoil layer (SOC_{ST}), the land use factor (F_{LU}), the management factor (F_{MG}) and the input factor (F_i).

Where:

$$SOC_j = \left(SOC_{ST,j} * F_{LU,j} * F_{MG,j} * F_{i,j}\right)$$

9.8 Methods not based on measurements could be used as an alternative to calculate *SOC* with standard values, taking into account climate, soil type, land cover, land management and inputs.

9.9 Aggregation of areas: apply the same Equation (5) (e_l) on each type *j* of eligible land (e_{lj}), as follow:

$$e_{lj} = \frac{e_l}{l_j} - e_{bj}$$

$$l_j = \frac{L_j \times y_j}{\sum_j L_j \times y_j}$$

Where:

lj is the land use share of type *j;*

e_b is the specific bonus, measured in terms of gCO_2eq per of energy if biomass is obtained from recovered severely degraded land. This parameter needs to be defined in further discussions and if there is consensus, the specific bonus will be subtracted from the equation;

L_j is the area of each reference type of land *j* converted to feedstock cultivation, measured in hectare; and

y_l is the yield of feedstock for each type of converted land *j*, measured in tons per hectare per year.

9.10 The operators should apply the following formula on all types of eligible land to calculate DLUC, in gCO_2 e/MJ:

$$e_l = \sum_j e_{lj} \times l_j$$

9.11 For the establishment of e_{sca} and following IPCC (2019) and ISO 14067:2018 recommendations, the equation that an operator should use for the determination of e_{sca}, measured as mass (g) of CO_2eq per MJ biofuel, is the following:

Equation (6): $e_{sca} = \left(CS_{A,j} - CS_{R,j}\right) \times 3.664 \times \frac{1}{n\ x\ P}$

The terms refer to:

$CS_{R,j}$ the mass of soil and vegetation carbon stock of the land type *j* per unit area associated with the reference crop management practice in g of C per ha in January 2008 or 20 years before the raw material was obtained;

$CS_{A,j}$ the mass of soil and vegetation estimated carbon stock of the land type *j* per unit area associated with the actual crop management practices after at least 10 years of application in g of C per ha;

3.664 the quotient obtained by dividing the molecular weight of CO_2 (44,010g/mol) by the molecular weight of carbon (12,011g/mol) in g CO_2eq/g C;

n equal to 20, which corresponds to the number of years for amortization of the emissions in the IMO framework; and

P the productivity of the crop (measured as MJ biofuel per ha per year).

The emissions from the increased fertilizers or herbicide use, which may result from the specific agricultural practice, expressed in gCO_2eq per MJ biofuel, have to be properly accounted in the emissions associated with the feedstock extraction / cultivation / acquisition / recovery (e_{fecu}).

9.12 According to existing standards, the CS_R and CS_A parameter have to be determined by means of direct measurements of soil and vegetation carbon stocks or calculated by appropriate tools, accepted in the certification process. the CS_R and CS_A values, measured as mass (g) of carbon per unit area (ha), are obtained by considering:

$$CS_{R,j\ o\ A.j} = SOC_j + C_{veg,j}$$

Where C_{veg} is the above and below ground carbon stock of the vegetation, including dead organic matter, measured as mass (g) of carbon per unit area (ha), according to IPCC Guidelines.

SOC is the amount of soil organic carbon, measured as mass (g) of carbon per unit area (ha).

Appropriate conversion is needed to obtain a final gCO_2eq/MJ of fuel.

9.13 Methods not based on measurements could be used as an alternative to calculate *SOC* with standard values, taking into account climate, soil type, land cover, land management and inputs. The IPCC Guidelines methodology can be applied for calculation of changes in carbon stocks. The adoption of improved agricultural management practices must be addressed under the IPCC "cropland remaining cropland" framework. The parameter consists of four factors, which depend on climate, soil type, management practice and C-input practice: the standard soil organic carbon in the topsoil layer (SOC_{ST}),[19] the land use factor (F_{LU}), the management factor (F_{MG}) and the input factor (F_i). Deeper soil depths (i.e.: 1m or more) can be accepted in case of actual measurements of C stocks soil.

Where:

$$SOC_j = \left(SOC_{ST,j} * F_{LU,j} * F_{MG,j} * F_{i,j}\right)$$

9.14 For aggregation of areas, the same Equation (6) (e_{sca}) should be applied on each type *j* of eligible land ($e_{sca,j}$), as follow:

$$e_{sca,j} = \frac{e_{sca}}{l_j}$$

$$l_j = \frac{L_j \times y_j}{\sum_j L_j \times y_j}$$

Where:

lj is the land use share of type *j;*

L_j is the area of each reference type of land *j* converted to feedstock cultivation, measured in hectare; and

[19] Proper method to assess SOC_{ST} to be agreed with the certification scheme.

y_l is the yield of feedstock for each type of converted land *j*, measured in tonnes per hectare per year.

9.15 The following formula should be applied on all types of eligible land to calculate e_{sca}, in gCO_2e/MJ:

$$e_{sca} = \sum_j e_{sca,j} \times l_j$$

9.16 A non-exhaustive set of improved agriculture management practices, accepted for the purpose of achieving emission savings from soil carbon accumulation is listed below:

.1 shifting to meaningful reductions in soil tillage;

.2 improved crop/rotation schemes (i.e *SOC* increase);

.3 multicropping, intercropping, and crop rotation;

.4 integration systems of crop, livestock, and forestry;

.5 the use of cover crops, including crop residue management;

.6 the use of organic soil improver (e.g.: compost, digestate, biochar, etc.);

.7 meaningful increase in soil coverage;

.8 no till and reduced till;

.9 sugarcane harvested without burning; and

.10 structural measure to control soil erosion like contour farming.

9.17 TtW default emission factors should be calculated using representative and conservative assumptions, which encompass variable conditions onboard of the ships and performance of energy converters. The reference values used to establish default emission factors should be accompanied by the relevant technical and scientific information (see the template set out in appendix 5) and evaluated against the corresponding information as appropriate, including the agreement between the reference values.

9.18 For the establishment of C_{fCO2} for fuels that can be represented using chemical formula, C_{fCO2} emission factor can be calculated by dividing the molar ratio of carbon to CO_2 by the molar ratio of carbon to the fuel. If fuels cannot be represented using chemical formula, such as biofuels and fossil fuels, the C_{fCO2} factor can be calculated using actual measurement of carbon content according to internationally recognized standards as ASTM D5291 and D6866, etc.

9.19 The C_{fCH4}, C_{fN2O} and C_{slip} emission factors depend on the type of fuel, engine and the engine load. In the case of existing fuels and existing engines, these factors can be obtained using reference values from the *Fourth IMO GHG Study 2020.*[20] However, for other types of fuels and engines, further work is needed to establish measurement procedures.

[20] https://www.imo.org/en/ourwork/Environment/Pages/Fourth-IMO-Greenhouse-Gas-Study-2020.aspx

9.20 Fugitive emissions are difficult to measure but the existing studies state they are very small in comparison to other GHG emissions. C_{fug} should be set as 0 (zero) until further evidence enabling the establishment of a value exists, nevertheless it should be kept as a placeholder for continuous review.

9.21 In case additional categories of energy converters (not listed in appendix 2) are proposed, the rules to establish TtW default emission factors as described in paragraph 9.17 above may be followed to ensure that these new converters (e.g. fuel cells) may also be associated with a default emission factor.

9.22 For aftertreatment/abatement systems, no default values should be established due to varying performance of this equipment, instead a superior GHG performance can be demonstrated through actual emission factors, subject to verification and certification by a third party.

9.23 For electricity delivered by Onshore Power Supply (OPS) the GHG intensity default value corresponds to the GHG intensity of the national grid. Considering that the GHG intensity national grid are frequently updated this information is not included in these guidelines and the following sources can be used, if the methodology is based in internationally recognized standards: governmental and utility sources, internationally acknowledged public databases, national inventories and national energy regulators.

10 ACTUAL EMISSION FACTORS

10.1 The aim of actual emission factors is to allow demonstration of superior GHG performance compared to the default emission factors, subject to verification and certification by a third party.

10.2 WtT and TtW emission factors should be based on methodologies established in these guidelines. Actual values provide the WtW (WtT and TtW) GHG intensity for the specific fuel over the life cycle (from fuel production to its use on board).

10.3 For the pathways contained in appendix 1, the description and the calculation method for providing WtT actual emission factors should be provided. In addition, for the pathways not contained in appendix 1, a detailed description of the pathway should be provided.

10.4 The use of actual WtT emission factors is not applicable to purely fossil pathways. However, for fuels which are produced from captured carbon of fossil origin and for fossil fuels where the technology of CCS/CCUS is applied, actual values are allowed. For the fossil component of a blended fuel, fossil fuel default emission factors should be used.

10.5 Actual TtW emission factors are allowed for all fuel pathways[21] and provided in these guidelines. As mentioned in paragraphs 9.19 and 9.22, further work is needed to develop procedures to certify C_{fCH4}, C_{fN2O} and C_{slip} emission factors, and to take in consideration aftertreatment/abatement systems.

10.6 Power Purchase Agreements (PPA) including a GHG intensity for electricity delivered by OPS can be used to certify an actual value if a procedure is in place to establish electricity GHG intensity and a certificate of the Guarantees of Origin, recognized by the Organization.

[21] Verification and certification methodologies would need further work to be established.

PART IV: VERIFICATION AND CERTIFICATION

11 ELEMENTS SUBJECT TO VERIFICATION/CERTIFICATION

11.1 When used as evidence for performances, the FLL needs to be verified and certified by a third party, taking into account further guidance to be developed by the Organization.

11.2 The verification and certification of Part A, Part B, Part C and Part E of the FLL may be carried out separately by different verification bodies. The verification and certification of Part D of the FLL needs to be based on the verified Part A, Part B and Part C.

11.3 For fuel types with a specific fuel pathway code and which will be consumed in a specified energy converter, the default emission factors for Part A-5, Part C-1, Part C-2 and Part D of the FLL are provided in appendix 2. As long as Part A-1 to Part A-4 and Part C-3 of the FLL have been duly verified, the default emission factors contained in these guidelines can be consequently applied without further verification.

11.4 In the case where lower emission factors are claimed compared to the default emission factors for Part A-5, Part C-1, Part C-2 and/or Part D, the actual emission factors can be used only after the verification and certification by a third party, taking into account further guidance referred to in paragraph 11.1.

12 IDENTIFICATION OF CERTIFICATION SCHEMES/STANDARDS

12.1 The verification and certification of individual parts of the FLL will use relevant certification schemes/standards. Different parts of the FLL may be verified using different certification schemes/standards as applicable, while a specific part of the FLL may be addressed by multiple certification schemes/standards with similar scopes.

12.2 The certification schemes/standards used for the purposes specified in paragraph 12.1 above should be recognized by the Committee, taking into account guidance to be developed by the Organization. The list of recognized certification schemes/standards should be publicly available and kept under review.

12.3 Proposals to recognize international certification schemes/standards should be submitted to the Committee for consideration, including an assessment of a set of predetermined criteria which will be further developed for this purpose.

12.4 The framework, criteria and procedures leading to the recognition of certification schemes should be implemented uniformly to guarantee the quality, reliability and robustness of the IMO framework as a whole and to ensure a level playing field among certification schemes.

PART V: REVIEW

13 CONTINUOUS REVIEW PROCESS

13.1 To ensure that new technological advances and scientific knowledge are taken into account, these guidelines should be kept under continuous technical review taking into account emerging and evolving technologies.

13.2 In particular, the following elements should be kept under review:

.1 WtT, TtW and WtW default emission factors as specified in appendix 2; and

.2 new proposed fuel pathways and the corresponding default emission factors in addition to those specified in appendix 1.

APPENDIX 1

FUEL LIST WITH FUEL PATHWAY CODES

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
1	HFO (VLSFO)	Heavy Fuel Oil (ISO 8217 Grades RME, RMG and RMK, 0.10 < S ≤ 0.50%)	Crude Oil	Fossil	Standard refinery process	Grid mix electricity	HFO(VLSFO)_f_SR_gm
2	HFO (HSHFO)	Heavy Fuel Oil (ISO 8217 Grades RME, RMG and RMK exceeding 0.50% S)	Crude Oil	Fossil	Standard refinery process	Grid mix electricity	HFO(HSHFO)_f_SR_gm
3	LFO (ULSFO)	Light Fuel Oil (ISO 8217 Grades RMA, RMB and RMD maximum 0.10% S)	Crude Oil	Fossil	Standard refinery process	Grid mix electricity	LFO(ULSFO)_f_SR_gm
4	LFO (VLSFO)	Light Fuel Oil (ISO 8217 Grades RMA, RMB and RMD, 0.10 < S ≤ 0.50%)	Crude Oil	Fossil	Standard refinery process	Grid mix electricity	LFO(VLSFO)_f_SR_gm

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
5	Diesel/Gas oil (ULSFO)	Marine Diesel/Gas Oil (ISO 8217 Grades DMX, DMA, DMZ and DMB maximum 0.10 % S)	Crude Oil	Fossil	Standard refinery process	Grid mix electricity	MDO/MGO(ULSFO)_f_SR_gm
6	Diesel/Gas oil (VLSFO)	Marine Diesel/Gas Oil (ISO 8217 Grades DMX, DMA, DMZ and DMB, 0.10 < S ≤ 0.50%)	Crude Oil	Fossil	Standard refinery process	Grid mix electricity	MDO/MGO(VLSFO)_f_SR_gm
7	Diesel/Gas oil (ULSFO)	Bio co-processed marine fuel (ISO 8217 Grades DMX, DMA, DMZ and DMB maximum 0.10 % S)	Crude Oil + mixed biomass	Fossil/Biogenic	CoProcessing (CP) in refinery	Grid mix electricity	MDO/MGO(ULSFO)_f_b_CP_gm

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
8	Diesel/Gas oil (VLSFO)	Bio co-processed marine fuel (ISO 8217 Grades DMX, DMA, DMZ and DMB, 0.10 < S ≤ 0.50%)	Crude Oil + mixed biomass	Fossil/Biogenic	CoProcessing (CP) in refinery	Grid mix electricity	MDO/MGO(VLSFO)_f_b_CP_gm
9	Diesel/Gas oil (ULSFO)	Co-processed marine fuel (ISO 8217 Grades DMX, DMA, DMZ and DMB maximum 0.10 % S)	Crude Oil + recycled carbon	Fossil/Recycled carbon	CoProcessing (CP) in refinery	Grid mix electricity	MDO/MGO(ULSFO)_f_r_CP_gm
10	Diesel/Gas oil (VLSFO)	Co-processed marine fuel (ISO 8217 Grades DMX, DMA, DMZ and DMB, 0.10 < S ≤ 0.50%)	Crude Oil + recycled carbon	Fossil/Recycled carbon	CoProcessing (CP) in refinery	Grid mix electricity	MDO/MGO(VLSFO)_f_r_CP_gm
11	LPG[22]	Liquefied Petroleum Gas (Propane)	Crude Oil	Fossil	Standard refinery process and liquefaction	Grid mix electricity	LPG(Propane)_f_SR_gm

[22] Regarding LPG, these Guidelines consider the final product form the refineries to be always liquefied.

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
12	LPG	Liquefied Petroleum Gas (Propane)	CO_2 + H2	CO_2: Fossil Point Source Carbon Capture H2: Fossil Steam Methane Reformation	Fischer-Tropsch Synthesis and liquefaction	Grid mix electricity	LPG(Propane)_fCO_2_fH2_FT_gm
13	LPG	Liquefied Petroleum Gas (Propane)	CO_2 + H2	CO_2: Fossil Point Source Carbon Capture[23] H2: from Renewable electricity	Fischer-Tropsch Synthesis and liquefaction	Grid mix electricity	LPG(Propane)_fCO_2_rH2_FT_gm
14	LPG	Liquefied Petroleum Gas (Propane)	CO_2 + H2	CO_2: Fossil Point Source Carbon Capture H2: Industrial by-product hydrogen	Fischer-Tropsch Synthesis and liquefaction	Grid mix electricity	LPG(Propane)_fCO_2_ibpH2_FT_gm
15	LPG	Liquefied Petroleum Gas (Propane)	CO_2 + H2	CO_2: Direct Air Capture H2: Fossil Steam Methane Reformation	Fischer-Tropsch Synthesis and liquefaction	Grid mix electricity	LPG(Propane)_rCO_2_fH2_FT_gm

[23] CO_2: Fossil Point Source Carbon Capture includes captured CO_2 stemming from fuel combustion and captured CO_2 stemming from extraction of resources underground.

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
16	LPG	Liquefied Petroleum Gas (Propane)	CO_2 + H2	CO_2: Direct Air Capture H2: from Renewable electricity	Fischer-Tropsch Synthesis and liquefaction	Grid mix electricity	LPG(Propane)_rCO_2_rH2_FT_gm
17	LPG	Liquefied Petroleum Gas (Propane)	CO_2 + H2	CO_2: Direct Air Capture H2: Industrial by-product hydrogen	Fischer-Tropsch Synthesis and liquefaction	Grid mix electricity	LPG(Propane)_rCO_2_ibpH2_FT_gm
18	LPG	Liquefied Petroleum Gas (Propane)	CO_2 + H2	CO_2: Biogenic Point Source Carbon Capture H2: Fossil Steam Methane Reformation	Fischer-Tropsch Synthesis and liquefaction	Grid mix electricity	LPG(Propane)_bCO_2_fH2_FT_gm
19	LPG	Liquefied Petroleum Gas (Propane)	CO_2 + H2	CO_2: Biogenic Point Source Carbon Capture H2: from Renewable electricity	Fischer-Tropsch Synthesis and liquefaction	Grid mix electricity	LPG(Propane)_bCO_2_rH2_FT_gm
20	LPG	Liquefied Petroleum Gas (Propane)	CO_2 + H2	CO_2: Biogenic Point Source Carbon Capture H2: Industrial by-product hydrogen	Fischer-Tropsch Synthesis and liquefaction	Grid mix electricity	LPG(Propane)_bCO_2_ibpH2_FT_gm

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
21	LPG	Liquefied Petroleum Gas (Butane)	Crude Oil	Fossil	Standard refinery process and liquefaction	Grid mix electricity	LPG(Butane)_f_SR_gm
22	LPG	Liquefied Petroleum Gas (Butane)	CO_2 + H2	CO_2: Fossil Point Source Carbon Capture H2: Fossil Steam Methane Reformation	Fischer-Tropsch Synthesis and liquefaction	Grid mix electricity	LPG(Butane)_fCO_2_fH2_FT_gm
23	LPG	Liquefied Petroleum Gas (Butane)	CO_2 + H2	CO_2: Fossil Point Source Carbon Capture H2: from Renewable electricity	Fischer-Tropsch Synthesis and liquefaction	Grid mix electricity	LPG(Butane)_fCO_2_rH2_FT_gm
24	LPG	Liquefied Petroleum Gas (Butane)	CO_2 + H2	CO_2: Fossil Point Source Carbon Capture H2: Industrial by-product hydrogen	Fischer-Tropsch Synthesis and liquefaction	Grid mix electricity	LPG(Butane)_fCO_2_ibpH2_FT_gm
25	LPG	Liquefied Petroleum Gas (Butane)	CO_2 + H2	CO_2: Direct Air Capture H2: Fossil Steam Methane Reformation	Fischer-Tropsch Synthesis and liquefaction	Grid mix electricity	LPG(Butane)_rCO_2_fH2_FT_gm

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
26	LPG	Liquefied Petroleum Gas (Butane)	CO_2 + H2	CO_2: Direct Air Capture H2: from Renewable electricity	Fischer-Tropsch Synthesis and liquefaction	Grid mix electricity	LPG(Butane)_rCO_2_rH2_FT_gm
27	LPG	Liquefied Petroleum Gas (Butane)	CO_2 + H2	CO_2: Direct Air Capture H2: Industrial by-product hydrogen	Fischer-Tropsch Synthesis and liquefaction	Grid mix electricity	LPG(Butane)_rCO_2_ibpH2_FT_gm
28	LPG	Liquefied Petroleum Gas (Butane)	CO_2 + H2	CO_2: Biogenic Point Source Carbon Capture H2: Fossil Steam Methane Reformation	Fischer-Tropsch Synthesis and liquefaction	Grid mix electricity	LPG(Butane)_bCO_2_fH2_FT_gm
29	LPG	Liquefied Petroleum Gas (Butane)	CO_2 + H2	CO_2: Biogenic Point Source Carbon Capture H2: from Renewable electricity	Fischer-Tropsch Synthesis and liquefaction	Grid mix electricity	LPG(Butane)_bCO_2_rH2_FT_gm
30	LPG	Liquefied Petroleum Gas (Butane)	CO_2 + H2	CO_2: Biogenic Point Source Carbon Capture H2: Industrial by-product hydrogen	Fischer-Tropsch Synthesis and liquefaction	Grid mix electricity	LPG(Butane)_bCO_2_ibpH2_FT_gm

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
31	LNG	Liquefied Natural Gas (Methane)	Natural Gas	Fossil	Standard LNG production including liquefaction	Grid mix electricity	LNG_f_SLP_gm
32	LNG	Liquefied Natural Gas (Methane)	Mixed 1st, 2nd and 3rd Gen. feedstock	Biogenic	Thermochemical gasification followed by methanation and liquefaction	Grid mix electricity	LNG_b_G_M_gm
33	LNG	Liquefied Natural Gas (Methane)	Mixed 1st, 2nd and 3rd Gen. feedstock	Biogenic	Bio-derived LNG via Anaerobic Digestion, separation and liquefaction	Grid mix electricity	LNG_b_AD_gm
34	LNG	Liquefied Natural Gas (Methane)	Mixed 1st, 2nd and 3rd Gen. feedstock	Biogenic	Bio-derived LNG via Anaerobic Digestion, separation with Point Source Carbon Capture (PSCC) and long-term storage and liquefaction	Grid mix electricity	LNG_b_AD_CCS_gm
35	LNG	Liquefied Natural Gas (Methane)	CO_2 + H2	CO_2: Fossil Point Source Carbon Capture H2: Fossil Steam Methane Reformation	Methanation and liquefaction	Grid mix electricity	LNG_fCO_2_fH2_M_gm
36	LNG	Liquefied Natural Gas (Methane)	CO_2 + H2	CO_2: Fossil Point Source Carbon Capture H2: from Renewable electricity	Methanation and liquefaction	Grid mix electricity	LNG_fCO_2_rH2_M_gm

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
37	LNG	Liquefied Natural Gas (Methane)	CO_2 + H2	CO_2: Fossil Point Source Carbon Capture H2: Industrial by-product hydrogen	Methanation and liquefaction	Grid mix electricity	LNG_fCO_2_ibpH2_M_gm
38	LNG	Liquefied Natural Gas (Methane)	CO_2 + H2	CO_2: Direct Air Capture H2: Fossil Steam Methane Reformation	Methanation and liquefaction	Grid mix electricity	LNG_rCO_2_fH2_M_gm
39	LNG	Liquefied Natural Gas (Methane)	CO_2 + H2	CO_2: Direct Air Capture H2: from Renewable electricity	Methanation and liquefaction	Grid mix electricity	LNG_rCO_2_rH2_M_gm
40	LNG	Liquefied Natural Gas (Methane)	CO_2 + H2	CO_2: Direct Air Capture H2: Industrial by-product hydrogen	Methanation and liquefaction	Grid mix electricity	LNG_rCO_2_ibpH2_M_gm
41	LNG	Liquefied Natural Gas (Methane)	CO_2 + H2	CO_2: Biogenic Point Source Carbon Capture H2: Fossil Steam Methane Reformation	Methanation and liquefaction	Grid mix electricity	LNG_bCO_2_fH2_M_gm

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
42	LNG	Liquefied Natural Gas (Methane)	CO_2 + H2	CO_2: Biogenic Point Source Carbon Capture H2: from Renewable electricity	Methanation and liquefaction	Grid mix electricity	LNG_bCO_2_rH2_M_gm
43	LNG	Liquefied Natural Gas (Methane)	CO_2 + H2	CO_2: Biogenic Point Source Carbon Capture H2: Industrial by-product hydrogen	Methanation and liquefaction	Grid mix electricity	LNG_bCO_2_ibpH2_M_gm
44	CNG	Compressed Natural Gas (Methane)	Natural Gas	Fossil	Standard refinery process and compression	Grid mix electricity	CNG_f_SR_gm
45	CNG	Compressed Natural Gas (Methane)	Mixed 1st, 2nd and 3rd Gen. feedstock	Biogenic	Thermochemical gasification followed by methanation and compression	Grid mix electricity	CNG_b_G_M_gm
46	CNG	Compressed Natural Gas (Methane)	Mixed 1st, 2nd and 3rd Gen. feedstock	Biogenic	Bio-derived LNG via Anaerobic Digestion and separation and compression	Grid mix electricity	CNG_b_AD_gm
47	CNG	Compressed Natural Gas (Methane)	Mixed 1st, 2nd and 3rd Gen. feedstock	Biogenic	Bio-derived LNG via Anaerobic Digestion, separation with Point Source Carbon Capture (PSCC) and long-term storage and compression	Grid mix electricity	CNG_b_AD_CCS_gm

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
48	CNG	Compressed Natural Gas (Methane)	CO_2 + H2	CO_2: Fossil Point Source Carbon Capture H2: Fossil Steam Methane Reformation	Methanation and compression	Grid mix electricity	CNG_fCO_2_fH2_M_gm
49	CNG	Compressed Natural Gas (Methane)	CO_2 + H2	CO_2: Fossil Point Source Carbon Capture H2: from Renewable electricity	Methanation and compression	Grid mix electricity	CNG_fCO_2_rH2_M_gm
50	CNG	Compressed Natural Gas (Methane)	CO_2 + H2	CO_2: Fossil Point Source Carbon Capture H2: Industrial by-product hydrogen	Methanation and compression	Grid mix electricity	CNG_fCO_2_ibpH2_M_gm
51	CNG	Compressed Natural Gas (Methane)	CO_2 + H2	CO_2: Direct Air Capture H2: Fossil Steam Methane Reformation	Methanation and compression	Grid mix electricity	CNG_rCO_2_fH2_M_gm
52	CNG	Compressed Natural Gas (Methane)	CO_2 + H2	CO_2: Direct Air Capture H2: from Renewable electricity	Methanation and compression	Grid mix electricity	CNG_rCO_2_rH2_M_gm

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
53	CNG	Compressed Natural Gas (Methane)	CO_2 + H2	CO_2: Direct Air Capture H2: Industrial by-product hydrogen	Methanation and compression	Grid mix electricity	CNG_rCO_2_ibpH2_M_gm
54	CNG	Compressed Natural Gas (Methane)	CO_2 + H2	CO_2: Biogenic Point Source Carbon Capture H2: Fossil Steam Methane Reformation	Methanation and compression	Grid mix electricity	CNG_bCO_2_fH2_M_gm
55	CNG	Compressed Natural Gas (Methane)	CO_2 + H2	CO_2: Biogenic Point Source Carbon Capture H2: from Renewable electricity	Methanation and compression	Grid mix electricity	CNG_bCO_2_rH2_M_gm
56	CNG	Compressed Natural Gas (Methane)	CO_2 + H2	CO_2: Biogenic Point Source Carbon Capture H2: Industrial by-product hydrogen	Methanation and compression	Grid mix electricity	CNG_bCO_2_ibpH2_M_gm
57	Ethane	Ethane	Natural Gas	Fossil	Standard refinery process	Grid mix electricity	Ethane_f_SR_gm
58	Vegetable oil-based fuel	Straight Vegetable Oil	1st Gen. feedstock	Biogenic	Extraction and purification	Grid mix electricity	SVO_b_EP _1stgen_gm
59	Vegetable oil-based fuel	Used oils and fats	2nd Gen. feedstock	Biogenic	Extraction and purification	Grid mix electricity	UOF_b_EP _2ndgen_gm

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
60	Vegetable oil-based fuel	Algae oil	3rd Gen. feedstock	Biogenic	Extraction and purification	Grid mix electricity	AO_b_EP _3rdgen_gm
61	Diesel	Diesel (FAME)	1st Gen. feedstock	Biogenic	Transesterification	Grid mix electricity	FAME_b_TRE_1stgen_gm_
62	Diesel	Diesel (FAME)	2nd Gen. feedstock	Biogenic	Transesterification	Grid mix electricity	FAME_b_TRE_2ndgen_gm_
63	Diesel	Diesel (FAME)	3rd Gen. feedstock	Biogenic	Transesterification	Grid mix electricity	FAME_b_TRE_3rdgen_gm_
64	Diesel	Renewable Diesel (Bio FT-Diesel)	1st Gen. feedstock	Biogenic	Gasification and Fischer-Tropsch Synthesis	Grid mix electricity	FT-Diesel_b_G_FT_1stgen_gm_
65	Diesel	Renewable Diesel (Bio FT-Diesel)	Mixed 1st, 2nd and 3rd Gen. feedstock	Biogenic	Anaerobic digestion and methane separation and Fischer-Tropsch Synthesis	Grid mix electricity	FT-Diesel_b_AD_FT_gm
66	Diesel	Renewable Diesel (Bio FT-Diesel)	Mixed 1st, 2nd and 3rd Gen. feedstock	Biogenic	Anaerobic digestion and methane separation and Fischer-Tropsch Synthesis with Point Source Carbon Capture (PSCC) and long-term storage	Grid mix electricity	FT-Diesel_b_AD_FT_CCS_gm
67	Diesel	Renewable Diesel (FT-Diesel)	CO_2 + H2	CO_2: Fossil Point Source Carbon Capture H2: Fossil Steam Methane Reformation	Fischer-Tropsch Synthesis	Grid mix electricity	FT-Diesel_fCO_2_fH2_FT_gm

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
68	Diesel	Renewable Diesel (FT-Diesel)	CO_2 + H2	CO_2: Fossil Point Source Carbon Capture H2: from Renewable electricity	Fischer-Tropsch Synthesis	Grid mix electricity	FT-Diesel_fCO_2_rH2_FT_gm
69	Diesel	Renewable Diesel (FT-Diesel)	CO_2 + H2	CO_2: Fossil Point Source Carbon Capture H2: Industrial by-product hydrogen	Fischer-Tropsch Synthesis	Grid mix electricity	FT-Diesel_fCO_2_ibpH2_FT_gm
70	Diesel	Renewable Diesel (FT-Diesel)	CO_2 + H2	CO_2: Direct Air Capture H2: Fossil Steam Methane Reformation	Fischer-Tropsch Synthesis	Grid mix electricity	FT-Diesel_rCO_2_fH2_FT_gm
71	Diesel	Renewable Diesel (FT-Diesel)	CO_2 + H2	CO_2: Direct Air Capture H2: from Renewable electricity	Fischer-Tropsch Synthesis	Grid mix electricity	FT-Diesel_rCO_2_rH2_FT_gm
72	Diesel	Renewable Diesel (FT-Diesel)	CO_2 + H2	CO_2: Direct Air Capture H2: Industrial by-product hydrogen	Fischer-Tropsch Synthesis	Grid mix electricity	FT-Diesel_rCO_2_ibpH2_FT_gm

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
73	Diesel	Renewable Diesel (FT-Diesel)	CO_2 + H2	CO_2: Biogenic Point Source Carbon Capture H2: Fossil Steam Methane Reformation	Fischer-Tropsch Synthesis	Grid mix electricity	FT-Diesel_bCO_2_fH2_FT_gm
74	Diesel	Renewable Diesel (FT-Diesel)	CO_2 + H2	CO_2: Biogenic Point Source Carbon Capture H2: from Renewable electricity	Fischer-Tropsch Synthesis	Grid mix electricity	FT-Diesel_bCO_2_rH2_FT_gm
75	Diesel	Renewable Diesel (FT-Diesel)	CO_2 + H2	CO_2: Biogenic Point Source Carbon Capture H2: Industrial by-product hydrogen	Fischer-Tropsch Synthesis	Grid mix electricity	FT-Diesel_bCO_2_ibpH2_FT_gm
76	Diesel	Renewable Diesel (HVO)	1st Gen. feedstock	Biogenic	Hydrogenation	Grid mix electricity	HVO_b_HD_1stgen_gm_
77	Diesel	Renewable Diesel (HVO)	2nd Gen. feedstock	Biogenic	Hydrogenation	Grid mix electricity	HVO_b_HD_2ndgen_gm_
78	Diesel	Renewable Diesel (HVO)	3rd Gen. feedstock	Biogenic	Hydrogenation	Grid mix electricity	HVO_b_HD_3rdgen_gm_
79	DME	Dimethyl Ether (DME)	1st Gen. feedstock	Biogenic	Gasification and DME Synthesis	Grid mix electricity	DME_b_G_DMES_1stgen_gm_
80	DME	Dimethyl Ether (DME)	2nd Gen. feedstock	Biogenic	Gasification and DME Synthesis	Grid mix electricity	DME-b-G-DMES_2ndgen_gm_

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
81	DME	Dimethyl Ether (DME)	Mixed 1st, 2nd and 3rd Gen. feedstock	Biogenic	Anaerobic digestion and methane separation and DME Synthesis	Grid mix electricity	DME_b_AD_DMES_gm
82	DME	Dimethyl Ether (DME)	Mixed 1st, 2nd and 3rd Gen. feedstock	Biogenic	Anaerobic digestion and methane separation and DME Synthesis with Point Source Carbon Capture (PSCC) and long-term storage	Grid mix electricity	DME_b_AD_DMES_CCS_gm
83	DME	Dimethyl Ether (DME)	Natural Gas	Fossil	Gasification and DME Synthesis	Grid mix electricity	DME_f_G_DMES_gm
84	Diesel	Upgraded Pyrolysis Oil	2nd Gen. feedstock	Biogenic	Pyrolysis, Fast Pyrolysis and/or Catalytic Fast Pyrolysis and upgrading	Grid mix electricity	UPO_b_UPO_2ndgen_gm_
85	Diesel	Hydrothermal Liquefaction (HTL) Oil	2nd Gen. feedstock	Biogenic	Hydrothermal liquefaction and upgrading	Grid mix electricity	HTL_b_HTL_2ndgen_gm_
86	Methanol	Methanol	Natural Gas	Fossil	Steam Methane Reformation of Natural Gas and Methanol Synthesis	Grid mix electricity	MeOH_f_SMR_gm
87	Methanol	Methanol	Natural Gas	Fossil	Steam Methane Reformation of Natural Gas with Carbon Capture & Storage and Methanol Synthesis	Grid mix electricity	MeOH_f_SMR_CCS_gm

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
88	Methanol	Methanol	Coal	Fossil	Gasification of Coal and Methanol Synthesis	Grid mix electricity	MeOH_f_G_MS_gm
89	Methanol	Methanol	Coal	Fossil	Gasification of Coal with Carbon Capture & Storage and Methanol Synthesis	Grid mix electricity	MeOH_f_G_MS_CCS _gm
90	Methanol	Methanol	2nd and 3rd Gen. feedstock	Biogenic	Gasification of Biomass and Methanol Synthesis	Grid mix electricity	MeOH_b_G_MS_gm
91	Methanol	Methanol	Mixed 1st, 2nd and 3rd Gen. feedstock	Biogenic	Reforming of Renewable Natural Gas (biomethane from Anaerobic Digestion) and Methanol Synthesis	Grid mix electricity	MeOH_b_AD_MS_gm
92	Methanol	Methanol	CO_2 + H2	CO_2: Fossil Point Source Carbon Capture H2: Fossil Steam Methane Reformation	Methanol Synthesis	Grid mix electricity	MeOH_fCO_2_fH2_MS_gm
93	Methanol	Methanol	CO_2 + H2	CO_2: Fossil Point Source Carbon Capture H2: from Renewable electricity	Methanol Synthesis	Grid mix electricity	MeOH_fCO_2_rH2_MS_gm

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
94	Methanol	Methanol	CO_2 + H2	CO_2: Fossil Point Source Carbon Capture H2: Industrial by-product hydrogen	Methanol Synthesis	Grid mix electricity	MeOH_fCO_2_ibpH2_MS_gm
95	Methanol	Methanol	CO_2 + H2	CO_2: Direct Air Capture H2: Fossil Steam Methane Reformation	Methanol Synthesis	Grid mix electricity	MeOH_rCO_2_fH2_MS_gm
96	Methanol	Methanol	CO_2 + H2	CO_2: Direct Air Capture H2: from Renewable electricity	Methanol Synthesis	Grid mix electricity	MeOH_rCO_2_rH2_MS_gm
97	Methanol	Methanol	CO_2 + H2	CO_2: Direct Air Capture H2: Industrial by-product hydrogen	Methanol Synthesis	Grid mix electricity	MeOH_rCO_2_ibpH2_MS_gm
98	Methanol	Methanol	CO_2 + H2	CO_2: Biogenic Point Source Carbon Capture H2: Fossil Steam Methane Reformation	Methanol Synthesis	Grid mix electricity	MeOH_bCO_2_fH2_MS_gm

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
99	Methanol	Methanol	CO_2 + H2	CO_2: Biogenic Point Source Carbon Capture H2: from Renewable electricity	Methanol Synthesis	Grid mix electricity	MeOH_bCO_2_rH2_MS_gm
100	Methanol	Methanol	CO_2 + H2	CO_2: Biogenic Point Source Carbon Capture H2: Industrial by-product hydrogen	Methanol Synthesis	Grid mix electricity	MeOH_bCO_2_ibpH2_MS_gm
101	Ethanol	Ethanol	1st Gen. feedstock	Biogenic	Fermentation	Grid mix electricity	EtOH_b_FR_1stgen_gm_
102	Ethanol	Ethanol	2nd Gen. feedstock	Biogenic	Pretreatment/hydrolysis step and Fermentation	Grid mix electricity	EtOH_b_FR_2ndgen_gm_
103	Ethanol	Ethanol	3rd Gen. feedstock	Biogenic	Fermentation	Grid mix electricity	EtOH_b_FR_3rdgen_gm_
104	Hydrogen	Hydrogen	Natural Gas	Fossil	Steam Methane Reformation of Natural Gas	Grid mix electricity	H2_f_SMR_gm
105	Hydrogen	Hydrogen	Natural Gas	Fossil	Steam Methane Reformation of Natural Gas with Carbon Capture and long-term storage	Grid mix electricity	H2_f_SMR_CCS_gm
106	Hydrogen	Hydrogen	Natural Gas	Fossil	Methane Pyrolysis into carbon and hydrogen	Grid mix electricity	H2_f_MPO_gm

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
107	Hydrogen	Hydrogen	Coal	Fossil	Gasification or Carbonization of Coal	Grid mix electricity	H2_f_G_gm
108	Hydrogen	Hydrogen	Coal	Fossil	Gasification or Carbonization of Coal with Carbon Capture and long-term storage	Grid mix electricity	H2_f_G_CCS _gm
109	Hydrogen	Hydrogen	2nd Gen. feedstock	Biogenic	Gasification of biomass and Syngas separation with Point Source Carbon Capture (PSCC) and long-term storage	Grid mix electricity	H2_b_G_SS_CCS_2ndgen_ gm_
110	Hydrogen	Hydrogen	Water + Electricity	Renewable	Dedicated Photovoltaic and/or Wind and/or other Electrolysis and liquefaction	Renewable electricity	LH2_EL_r_Liquefied
111	Hydrogen	Hydrogen	Water + Electricity	Fossil/Renewable	Electrolysis and liquefaction	Grid mix electricity	LH2_EL_gm_Liquefied
112	Hydrogen	Hydrogen	Water + Electricity	Nuclear	Thermochemical Cycles or Electrolysis and liquefaction	Nuclear	LH2_EL_n_Liquefied
113	Hydrogen	Hydrogen		Industrial by-product hydrogen		Grid mix electricity	LH2_ _ibp_gm _Liquefied
114	Ammonia	Ammonia	Natural Gas	Fossil	Methane Pyrolysis into pure carbon and hydrogen and Haber Bosch process	Grid mix electricity	NH3_f_MPO_HB_gm

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
115	Ammonia	Ammonia	Natural Gas	Fossil	Steam Methane Reformation of Natural Gas and Haber Bosch process	Grid mix electricity	NH3_f_SMR_HB_gm
116	Ammonia	Ammonia	Natural Gas	Fossil	Steam Methane Reformation of Natural Gas with Point Source Carbon Capture (PSCC) and long-term storage and Haber Bosch process	Grid mix electricity	NH3_f_SMR_HB_CCS_gm
117	Ammonia	Ammonia	Coal	Fossil	Gasification of Coal and Haber Bosch process	Grid mix electricity	NH3_f_G_HB_gm
118	Ammonia	Ammonia	Coal	Fossil	Gasification of Coal with Carbon Capture and long-term storage and Haber Bosch process	Grid mix electricity	NH3_f_G_HB_CCS_gm
119	Ammonia	Ammonia	2nd Gen. feedstock	Biogenic	Gasification	Grid mix electricity	NH3_b_G_2ndgen_gm_
120	Ammonia	Ammonia	N2 + H2	N2: separated with renewable electricity H2: produced from renewable electricity	Haber Bosch process	Grid mix electricity	NH3_rN2_rH2_HB_gm

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
121	Ammonia	Ammonia	N2 + H2	N2: separated with renewable electricity H2: Fossil Steam Methane Reformation	Haber Bosch process	Grid mix electricity	NH3_rN2_fH2_HB_gm
122	Ammonia	Ammonia	N2 + H2	N2: separated with renewable electricity H2: Industrial by-product hydrogen	Haber Bosch process	Grid mix electricity	NH3_rN2_ibpH2_HB_gm
123	Ammonia	Ammonia	N2 + H2	N2: separated with grid mix electricity H2: Fossil Steam Methane Reformation	Thermochemical Cycles or Electrolysis	Nuclear	NH3_gmN2_fH2_EL_n
124	Ammonia	Ammonia	N2 + H2	N2: separated with grid mix electricity H2: produced from renewable electricity	Thermochemical Cycles or Electrolysis	Nuclear	NH3_gmN2_rH2_EL_n
125	Ammonia	Ammonia	N2 + H2	N2: separated with grid mix electricity H2: Industrial by-product hydrogen	Thermochemical Cycles or Electrolysis	Nuclear	NH3_gmN2_ibpH2_EL_n
126	Electricity	Electricity		Fossil/Renewable	-	Grid mix electricity	Electricity_gm

Order	Group	Fuel type	Feedstock structure		Conversion/Production process		Fuel Pathway Code
			Feedstock Type	Nature/Carbon Source	Process Type	Energy used in the process	
127 128	Electricity Wind propulsion	Electricity		Renewable	Dedicated Photovoltaic and/or Wind and/or other	Renewable electricity	Electricity_renewable

APPENDIX 2

INITIAL DEFAULT EMISSION FACTORS PER FUEL PATHWAY CODE

Order	Fuel type	Fuel Pathway Code	WtT GHG intensity (gCO_{2eq}/MJ)	LCV (MJ/g)	Energy Converter	C_f CO_2 (gCO_2/g fuel)	C_f CH_4 (gCH_4/g fuel)	C_f N_2O (gN_2O/g fuel)	C_{slip}/C_{fug} (mass %)	e_c gCO_{2eq}/g fuel	TtW GHG intensity (gCO_2eq/MJ)	NOTE
1	Heavy Fuel Oil (ISO 8217 Grades RME, RMG and RMK, 0.10 < S ≤ 0.50%)	HFO(VLSFO)_f_SR_gm	16.8	0.0402	ALL ICEs	3.114	0.00005	0.00018				Resolution MEPC.364(79) Fourth IMO GHG study
2	Heavy Fuel Oil (ISO 8217 Grades RME, RMG and RMK exceeding 0.50% S)	HFO(HSHFO)_f_SR_gm	14.1	0.0402	ALL ICEs	3.114	0.00005	0.00018				Resolution MEPC.364(79) Fourth IMO GHG study
3	Light Fuel Oil (ISO 8217 Grades RMA, RMB and RMD maximum 0.10% S)	LFO(ULSFO)_f_SR_gm		0.0412	ALL ICEs	3.151	0.00005	0.00018				Resolution MEPC.364(79) Fourth IMO GHG study
4	Light Fuel Oil (ISO 8217 Grades RMA, RMB and RMD, 0.10 < S ≤ 0.50%)	LFO(VLSFO)_f_SR_gm		0.0412	ALL ICEs	3.151	0.00005	0.00018				Resolution MEPC.364(79) Fourth IMO GHG study

Order	Fuel type	Fuel Pathway Code	WtT GHG intensity (gCO_{2eq}/MJ)	LCV (MJ/g)	Energy Converter	C_f CO_2 (gCO_2/g fuel)	C_f CH_4 (gCH_4/g fuel)	C_f N_2O (gN_2O/g fuel)	C_{slip}/C_{fug} (mass %)	e_c gCO_{2eq}/g fuel	TtW GHG intensity (gCO_2eq/MJ)	NOTE
5	Marine Diesel/Gas Oil (ISO 8217 Grades DMX, DMA, DMZ and DMB maximum 0.10 % S)	MDO/MGO(ULSFO)_f_SR_gm	17.7	0.0427	ALL ICEs	3.206	0.00005	0.00018				Resolution MEPC.364(79) Fourth IMO GHG study
6	Marine Diesel/Gas Oil (ISO 8217 Grades DMX, DMA, DMZ and DMB, 0.10 < S ≤ 0.50%)	MDO/MGO(VLSFO)_f_SR_gm		0.0427	ALL ICEs	3.206	0.00005	0.00018				Resolution MEPC.364(79) Fourth IMO GHG study
11	Liquefied Petroleum Gas (Propane)	LPG(Propane)_f_SR_gm		0.0463	ALL ICEs	3.000	0.00005	0.00018				Resolution MEPC.364(79) Fourth IMO GHG study
21	Liquefied Petroleum Gas (Butane)	LPG(Butane)_f_SR_gm		0.0457	ALL ICEs	3.030	0.00005	0.00018				Resolution MEPC.364(79) Fourth IMO GHG study

Order	Fuel type	Fuel Pathway Code	WtT GHG intensity (gCO_{2eq}/MJ)	LCV (MJ/g)	Energy Converter	C_f CO_2 (gCO_2/g fuel)	C_f CH_4 (gCH_4/g fuel)	C_f N_2O (gN_2O/g fuel)	C_{slip} /C_{fug} (mass %)	e_c gCO_{2eq}/g fuel	TtW GHG intensity (gCO_2eq /MJ)	NOTE
31	Liquefied Natural Gas (Methane)	LNG_f_SLP_gm		0.0480	LNG Otto (dual fuel medium speed)	2.750	0	0.00011	3.5/-			Resolution MEPC.364(79) Fourth IMO GHG study
					LNG Otto (dual fuel slow speed)				1.7/-			
					LNG Diesel (dual fuel slow speed)				0.15/-			
					LBSI (Lean-Burn Spark-Ignited)				2.6/-			
					Steam Turbines and boilers				0.01/-			

Order	Fuel type	Fuel Pathway Code	WtT GHG intensity (gCO_{2eq}/MJ)	LCV (MJ/g)	Energy Converter	$C_f CO_2$ (gCO_2/g fuel)	$C_f CH_4$ (gCH_4/g fuel)	$C_f N_2O$ (gN_2O/g fuel)	C_{slip}/C_{fug} (mass %)	e_c gCO_{2eq}/g fuel	TtW GHG intensity (gCO_2eq/MJ)	NOTE
33	Liquefied Natural Gas (Methane)	LNG_b_AD_gm			LNG Otto (dual fuel medium speed) LNG Otto (dual fuel slow speed) LNG Diesel (dual fuel slow speed) LBSI (Lean-Burn Spark-Ignited) Steam Turbines and boilers	2.750						
62	Diesel (FAME)	FAME_b_TRE_gm_2ndgen	20.8	0.0372	ALL ICEs							
77	Renewable Diesel (HVO)	HVO_b_HD_gm_2ndgen	14.9	0.044	ALL ICEs							

Order	**Fuel type**	**Fuel Pathway Code**	**WtT GHG intensity (gCO_{2eq}/ MJ)**	**LCV (MJ/g)**	**Energy Converter**	**C_f CO_2 (gCO_2/g fuel)**	**C_f CH_4 (gCH_4/g fuel)**	**C_f N_2O (gN_2O/g fuel)**	**C_{slip} /C_{fug} (mass %)**	**e_c** gCO_{2eq}/g fuel	**TtW GHG intensity (gCO_2eq /MJ)**	**NOTE**
105	Hydrogen	H2_f_SMR_CCS_gm		0.12	ALL ICEs Fuel cell	0						
121	Ammonia	NH3_rN2_fH2_HB_gm		0.0186	ALL ICEs Fuel cell	0						

APPENDIX 3

ABBREVIATIONS AND GLOSSARY

Abbreviations

AR – IPCC Assessment Report
BDN – Bunkering Delivery Note
C_f – Emission conversion factors $C_{fCO2/CH4/N2O}$ (g GHG (CO_2/CH_4/N_2O)/g fuel) for emissions of the combustion and/or oxidation process, including the fuel with relevant GWP effect resulting from the combustion energy conversion
CH_4 – Methane
CO_2 – Carbon dioxide
CO_{2eq} – Carbon dioxide equivalent
CCS – Carbon Capture and Storage
CCU – Carbon Capture and Utilization
DAC – Direct Air Capture
DCS – IMO ship fuel oil consumption Data Collection System
DLUC – Direct Land Use Change
FLL – Fuel Lifecycle Label
GHG – Greenhouse gas
GWP – Global Warming Potential
ILUC – Indirect Land Use Change
IPCC – Intergovernmental Panel on Climate Change
LCA – Life Cycle Assessment
LCV – Lower Calorific Value (MJ/g fuel)
NMVOC – Non-Methane Volatile Organic Compounds
N_2O – Nitrous oxide
NTC – NO_x Technical Code
RFNBO – Renewable Fuels of Non-Biological Origin
SLCF – Short-Lived Climate Forcers
TtW – Tank-to-Wake
WtT – Well-to-Tank
WtW – Well-to-Wake
VOC – Volatile Organic Compounds
OPS – Onshore Power Supply

Glossary

Co-product – an outcome of a production process, which has a relevant economic value and elastic supply (intended as the existence of a clear evidence of the causal link between feedstock market value and the quantity of feedstock that can be produced).

Biomass – biomass is renewable organic material that comes from plants and animals.

Renewables – any form of energy from solar, geophysical or biological sources that is replenished by natural processes at a rate that equals or exceeds its rate of use. Renewables are obtained from the continuing or repetitive flows of energy occurring in the natural environment and includes low-carbon technologies such as solar energy, hydropower, wind, tide and waves and ocean thermal energy, as well as renewable fuels such as biomass.

Global Warming Potential – global warming potential indicates the potential of a greenhouse gas to trap extra heat in the atmosphere over time in relation to carbon dioxide. The enhanced heat trapping in the atmosphere (i.e. the "greenhouse effect") is caused by the absorption of

infrared radiation by a given gas. The GWP also depends on the atmospheric lifetime of a gas, and the time-horizon considered (for example, GWP20 is based on the energy absorbed over 20 years, whereas GWP100 is based on the energy absorbed over 100 years). Each greenhouse gas has a specific global warming potential which is used to calculate the CO_2-equivalent (CO_{2eq}).

Land Use Change – Production of bio-based fuels leads to land use change (LUC). LUC can be classified as direct LUC (DLUC) and indirect LUC (ILUC).

Life Cycle Assessment (LCA) framework – life cycle assessment determines the potential environmental impacts of products, processes or services from cradle to grave, e.g. from acquisition/extraction of raw materials through to processing, transport, use and disposal.

System boundaries – The system boundary determines which entities (unit processes) are inside the system and which are outside. It essentially determines which life cycle/supply chain stages and processes are included in the assessment and need to be in accordance with the goal and scope of the study.

System expansion – ISO 14040 recommends the use of system expansion whenever possible. System expansion is part of the consequential LCA method that seeks to capture change in environmental impact as a consequence of a certain activity.

Well-to-Wake – WtW studies estimate the energy requirements and the resulting greenhouse gas (GHG) emissions in the production of a fuel and its use in a ship, based on the broader life cycle assessment (LCA) methodology. The term 'Well' is used for fuels from all sources, because although the term is most applicable to conventional crude oil resources, it is widely used and understood.

Onshore power supply – the system to supply electricity to ships at berth, at low or high voltage, alternate or direct current, including ship-side and port-side installations, when feeding any of the ship's electrical distribution switchboards for powering hotel and service workloads or charging secondary batteries

APPENDIX 4

TEMPLATE FOR WELL-TO-TANK DEFAULT EMISSION FACTOR SUBMISSION

INTRODUCTION

1 This template aims at collecting and presenting in a clear and structured manner the input data used to calculate a "default emission factor" for a specific "feedstock-to-fuel" pathway according to the methodology of the *2024 Guidelines on Life Cycle GHG Intensity of Marine Fuels (2024 LCA Guidelines)*, adopted on 22 March 2024 through resolution MEPC.391(81).[1] Only one default emission factor should be proposed per template form, i.e. to propose two emission default factors, two separate template forms should be filled. A "default emission factor" represents the quantitative results of the assessed greenhouse gas intensity (gCO_{2eq}/MJ) of a feedstock-to-fuel value chain. The default emission factor is not meant to represent the best available way to produce a fuel. It is a value describing a feedstock production, collection and transportation for conversion to an average/typical/standard plant, located in a generic region.[24] A default emission factor does not have to capture process improvement, with respect to current production, nor innovative technologies.[25] The goal of default emission factor is, at least, twofold:

.1 allow for fair comparison of GHG intensity among different technologies and fuel conversion pathways, where emissions resulting from some of the parameters in the WtT equation are set at zero by default (i.e. e_{sca}, e_l, e_{ccs}); In other words, allow for a general comparison among different fuel options and technologies;

.2 allow for operators to demonstrate actual life cycle of greenhouse gas emissions compared to the default life cycle emissions for the same feedstock-to-fuel pathway, through a certification process. The period of validity for the certification should be defined along with the rules and procedures of functioning of the certification.

The template provides full coverage of all elements necessary to define a default emission factor. It can be adapted (e.g. by not providing input data to each and every element it comprises) and complemented with additional information.

The LCA Guidelines specify in paragraph 4.4 that the WtT GHG emission factor (gCO_{2eq}/MJ(LCV) fuel or electricity) is calculated according to Equation (1).

Equation (1) $$GHG_{WtT} = e_{fecu} + e_l + e_p + e_{td} - e_{sca} - e_{ccs}$$

while paragraph 9.4 specifies that "Emissions related to carbon stock changes caused by direct land-use change (DLUC) (e_l) and emissions savings from soil carbon accumulation via improved agricultural management (e_{sca}) are considered as zero for the establishment of the default emission factors. Similarly, this is the case also for the parameters related to carbon capture and storage (CCS), which require further development." Accordingly, it should be noted that the default emission factors identified through the use of this submission template

[24] Default emission factors reflect the performance of feedstock-fuel pathways across world regions and States. Project-specific values certified according to relevant procedures agreed and adopted at IMO can be used as actual emission factors.

[25] In case of immature technologies, literature and modelling sources could be used, limited to the conversion process. However, the principle that this could be used as input data to refine/complete/revise emission factors as a future technology matures should be kept.

will only be partially reflective of WtT emissions attributable to any given "feedstock-to-fuel" pathway and may vary as emissions by sources and/or removals by sinks within the system boundary are taken into account.

2 Once default emission factors fully reflecting WtT GHG emissions are developed in a future iteration of the LCA Guidelines, operators (e.g. fuel producers) that are in a position to prove actual GHG emissions, may seek certification for a project certified "actual value". Certified actual values may also be used for pathways not having a default WtT GHG emission factor listed in appendix 2 of the LCA Guidelines.

3 This template allows indicating a 0 (zero) value for elements of Equation (1) that are temporarily not quantified as explained in paragraph 1 above. Data submitted as required for the calculation of default WtT GHG emission factors, need to ensure quality in terms of: relevance,[26] adequacy,[26] completeness,[27] consistency,[28] reliability,[29] transparency and accessibility.[30] The template can also be partially completed, e.g. by providing data for specific steps of the pathway.

PATHWAY DESCRIPTION

4 This section should clearly present the pathway modelled, intended as the value chain related to the production of a finished fuel, with the aim for providing at least information on inter alia: the type of feedstock used, a description of the technology used for converting such feedstock in the final fuel, and any other relevant information that affects the calculation of emission factors, consistently with the system boundary of the LCA guidelines.

5 The default emission factors are based on the WtT methodology, aiming at evaluating the amount of GHG emissions attributable to the fuel production and distribution. The production steps to be included in the calculation of a WtT emission factor are shown in figure 2 below:

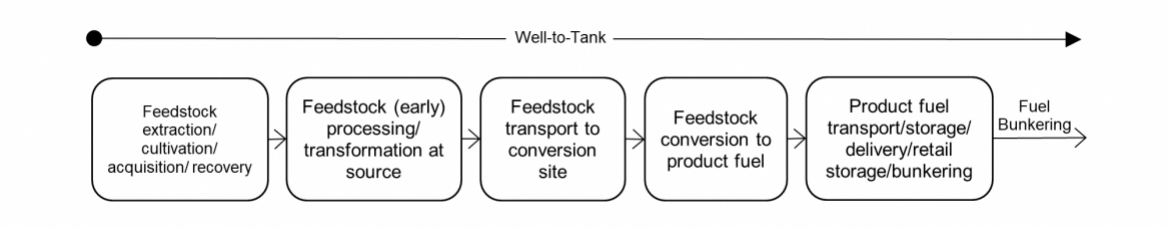

Figure 2 – Generic well-to-tank supply chain

The system boundaries defined for describing a specific feedstock-to-fuel pathway shall be in line with the definitions contained in the LCA guidelines.

Additional details and relevant information may be added in appendices, such as, production region, production capacity, age, etc. of facility or facilities.

26 Is the available data appropriate and reasonable in relation to the goal?

26 Does the data accurately describe the value chain under investigation? Are the uncertainties properly reported?

27 How completely does the data describe the value chain under investigation?

28 Is the data internally consistent? If there are redundant data values, do they have the same value?

29 Is the data regarded as valid/verifiable by the stakeholders?

30 Can the data be accessed and verified by a third party?

INPUT DESCRIPTION

6 This section should clearly present the input used for the modelling exercise.

7 The source of the data and of the model used should be reported, according to the indications about data quality provided in the LCA Guidelines.

8 Please inform if the LCA calculation has been developed in a particular modelling tool and in case of a positive answer, inform if any background information (information not listed below) has changed with respect to the standard data set and/or methodology used by the tool, and provide adequate justification for such change.

9 In order to provide guidance to fill the template, please see a worked example for a lipid feedstock production and conversion. The worked example is comprised of filled-in tables as necessary to report data, per pathway.

Table 1: e_{fecu} inputs and outputs for XXX feedstock

				XXXX, per dry kg	**Data source/Model used**	**Observations**
	XXX feedstock	Agricultural Inputs	Total N (g)	…	zzz et al. 2010	(explicit the type of N fertilizer, in %. Example: Total N is represented by 50% of Urea, 30% of Ammonium Nitrate, and 20%of..)
e_{fecu}			P_2O_5 (g)	…	ecoinvent	(explicit the type of P_2O_5 fertilizer)
			K_2O (g)	…	GREET	(explicit the type of K_2O fertilizer)
			Diesel (MJ)	…	…	
			Fugitive GHG emissions (e.g. CH_4) at feedstock extraction	…	…	
		per kg XXXX oil				
		Oil Extraction Inputs		Values	Data source/ Model used	
			Feedstock (g, dry)	…	zzz et al. 2010	
			NG (MJ)	…	ecoinvent	
			N-Hexane (MJ)	…	GREET	
			Electricity (MJ)	…	…	
			Fugitive GHG emissions (e.g. CH_4) at feedstock extraction	…	…	
			…	…	…	
		Oil Extraction Outputs	Co-product, zzz (g)	…	…	
			Protein cake from vegetable oil extraction	…	…	

Additional information:

Table 2: e_p inputs and outputs/losses for XXXX conversion process, including all the needed steps to pre-treat the feedstock in order to be able to convert it into the fuel, via the selected conversion process

	per MJ fuel		
		Values	**Data source/model used**
Inputs	Feedstock (g oil)	…	zzz et al. 2010
	NG (MJ)	…	ecoinvent
	H_2 (MJ)	*	GREET
	Electricity (MJ)[31]	…	…
	Explanatory remark: *placeholder for key material inputs (e.g. chemicals, etc.)*	…	…
Outputs	Co-product, propane mix (MJ)	**	…
	Co-product, naphtha (MJ)	**	…
	Co-product, xxxx (MJ)	**	…
	…	…	…
	Losses, e.g. fugitive CH_4 emissions	**	

*H_2 derived from NG steam reforming is assumed to be default H_2 source, the emission factors of H_2 are modelled based on NG input; ** Inputs after allocation

Additional information:

Table 3: Inputs for regional electricity generation mixes [32]

	US (%)[1]	**EU (%)[2]**	**India[3] (%)**	**xxx (%)[4]**
Residual oil	…	…	…	…
Natural gas	…	…	…	…
Coal	…	…	…	…
Nuclear power	…	…	…	…
Biomass	…	…	…	…
Hydroelectric	…	…	…	…
Geothermal	…	…	…	…
Wind	…	…	…	…
Solar PV	…	…	…	…
Others	…	…	…	…

[1] GREET 20xx, [2] EEA, 20xx (EU electricity mix 20xx), [3]International Energy Agency 20xx, [4] IGES List of Grid Emission Factors

31 Table 2 allows to detail information on electricity generation (which may be different from the regional mix).

32 Alternatively, please provide a statement with a clear referenced indication of the Greenhouse gas Intensity of the grid (gCO_{2eq}/kWh or gCO_{2eq}/MJ), and provide the reference used.

Additional information:

Table 4: e_{td} Emissions from Inputs and losses associated with the transportation of feedstock and fuels. In filling the table, please add the fuel used – In the "Data source/model used" please specify the type of fuel, the specific efficiency and energy converter, if available

	Feedstock Transportation		Data source/model used
e_{td} Inputs for Transport and Distribution	Distance (km)	xxx; xxx	
	Mode [33]	Heavy-duty truck; Train; Ship ; Barge; Rail; Pipeline; etc	
	Share (%)	yy; yy; yyy	
	Fuel Transportation		
	Distance (km)[34]	xxx; xxxx; xx	
	Mode	Heavy-duty truck; Train; Ship; Barge; Rail; Pipeline; etc	
	Share (%)	y; yy; yy	
	Fuel Distribution		
	Distance (km)	xx	
	Mode	Heavy-duty truck; Train; Ship; Barge; Rail; Pipeline; etc	
	Share (%)		
	…	…	
	Any other Transportation, Storage and Distribution emissions, including losses (e.g fugitive CH_4 emissions)		

[33] In case a mode of transport includes more fuels (e.g. diesel and natural gas) or various transport modes (e.g. track and ship), they should be properly reported in the calculation.

[34] Empty back-haul/return voyage(s) should be accounted in the calculation.

MAIN RESULTS

10 This section should present the results of the modelled pathway.

Table 5: Fuel identification

Fuel Pathway Code	LCV (MJ/g)	Density (kg/m^3)	C_{fCO2} (gCO_{2eq}/MJ)	Carbon Content (wt%)

Additional information:

Table 6: Proposed default emission factors for XXX-converted in a YYYY pathway

Fuel Pathway Code	Region	efecu Feedstock cultivation/extraction	etd Feedstock and fuel transportation/storge/distribution	ep Fuel production	(Sum of the terms) Proposed WtT GHG intensity (gCO_{2eq}/MJ) emission factors
	XXXX				

Additional information:

Table 7: Proposed default emission factors for XXX-converted in a YYYY pathway for comparative purposes using GWP20

A CALCULATION USING GLOBAL WARMING POTENTIAL OVER A 20-YEAR HORIZON (GWP20) MAY BE PROVIDED AS INFORMATION FOR COMPARATIVE PURPOSES.

Fuel Pathway Code	Region	e_{fecu} Feedstock cultivation/extraction	e_{td} Feedstock and fuel transportation/storage/distribution	e_p Fuel production	(Sum of the terms) Proposed WtT GHG intensity (gCO_{2eq}/MJ) emission factors
	XXXX				

Additional information:

APPENDIX

11 Brief description of the pathway

12 Brief description of the technology

….

REFERENCES

13 REF (APA format)

APPENDIX 5

TEMPLATE FOR TANK-TO-WAKE DEFAULT EMISSION FACTOR SUBMISSION

SUMMARY

This document presents a template to provide the minimum set of information to submit values for consideration as Tank-to-Wake (TtW) default emission factors.

INTRODUCTION

This template provides the form to submit values for consideration as Tank-to-Wake (TtW) default emission factors, with a minimum set of relevant technical and scientific information to allow the analysis of the adequacy of the proposed values.

TtW default emission factors should be calculated using representative and conservative assumptions, which encompass variable conditions onboard of the ships and performance of energy converters.

The rules to establish TtW default emission factor are described in paragraphs 9.17 and 9.22 of the LCA Guidelines. To establish a TtW default emission factor (with the exception of C_{fCO2}), at least three (3) reference values, from three different representative sources should be considered among the three (or more) values to be considered, the upper emission value should be selected as default, and the range of available emission factors should be provided for informative purposes. The reference values should be accompanied by the relevant technical and scientific information and evaluated against the corresponding information as appropriate, including the agreement between the reference values.

The LCA Guidelines allows demonstration of superior GHG performance compared to the default emission factors, trough actual emission factors subject to verification and certification by a third party.

PART A – EMISSION FACTORS FOR COMBUSTED FUEL (C_{fCH4} and C_{fN2O})

This part should contain the data to support proposals for C_{fCH4} and C_{fN2O} as defined in the LCA Guidelines;

Term	Units	Explanation
C_{fCH4}	g_{CH4}/g_{fuel}	CH_4 emission conversion factor ($g_{CH4}/g_{\text{fuel delivered to the ship}}$) for emissions of the combustion and/or oxidation process of the fuel used by the ship[36]
C_{fN2O}	g_{N2O}/g_{fuel}	N_2O emission conversion factor ($g_{N2O}/g_{\text{fuel delivered to the ship}}$) for emissions of the combustion and/or oxidation process of the fuel used by the ship

[36] For LNG/CNG fuel, the C_{slip_engine} is covering the role of C_{fCH4}, so C_{fCH4} is set to zero for these fuels.

1 METHODOLOGY

This section should clearly present the methodology for the measurements made and associated uncertainty.

Additional details and relevant information may be added in appendices, such as measurement procedures and equipment used, test-bed/onboard measurement, etc.

2 ENERGY CONVERTER DIFFERENTIATION

This section should clearly present the Energy converter differentiation (general model range)[37] shall be included in the proposed values, and the reasoning to follow such differentiation.

3 MAIN RESULTS

This section should present the results.

Table 1: Proposed values for C_{fCH4} and C_{fN2O}

	Fuel[38]								
	Order	Group	Fuel type	Energy converter[39]	Test Cycle[40]	Measurement Method[41]	$C_{f\,CH4}$ (g_{CH4}/g_{fuel}) [42]	$C_{f\,N2O}$ (g_{N2O}/g_{fuel}) [43]	Uncertainty
Example	5	Marine Diesel/Gas Oil (ISO 8217 Grades DMX, DMA, DMZ and DMB maximum 0.10 % S)	MDO/MGO (ULSFO)_f_ SR_gm	Two stroke Low speed Main engine	NTC-E3	Test-bed measurement	x	y	z%

37 Example: ICE/Piston Engines (2-Stroke, SSD/MSD), ICE/Piston Engines (4-Stroke, MSD), ICE/Piston Engines (4-Stroke, HSD), ICE/Gas Turbines (GT), Boilers, Dual Fuel, 4-stroke, Medium Speed, Low Pressure/Otto Cycle (LPMSDF 4-s Otto), Dual Fuel, 4-stroke, Medium Speed, High Pressure/Otto Cycle (HPMSDF 4-s Diesel), Dual Fuel, 2-stroke, Low Speed, Low Pressure/Otto Cycle (LPLSDF 2-s Otto), Dual Fuel (DF), 2-stroke, Low Speed, High Pressure/Diesel Cycle (HPLSDF 2-s Diesel), Gas-only, 4-stroke, Medium Speed, Low Pressure/Otto Cycle (LPMSGas 4-s Otto), Gas-only, 4-stroke, High Speed, Low Pressure/Otto Cycle (LPHSGas 4-s Otto), DF Boilers (DFB), Methane Reformer, (MRCH4), Methanol Reformer (MRCH3OH).

38 Fuel pathways listed in appendix 1 of the LCA guidelines (resolution MEPC.391(81)).

39 The proposal of default values should include a differentiation per energy converter with a technical explanation on how the Energy Converter classes were defined, the make and model of the engine where the emission tests was carried out, including engine design year.

40 It should be detailed the measurements at each load point.

41 For example, a reference to ISO 8178 and NO_x Technical Code 2008. It should include the list of instruments used to measure emissions, test location (lab/onboard).

42 The proposed data should be expressed in $g_{CH4}/g_{\text{fuel consumed by the energy converter}}$. If from the data submitted arises the need to differentiate C_{fCH4} by energy converter, then a C_{fCH4} expressed in $g_{CH4}/g_{\text{fuel delivered to the ship}}$ needs to be calculated trough the weighted average of the different C_{fCH4} taking in consideration the fuel consumed on each energy converter.

43 The proposed data should be expressed in $g_{N2O}/g_{\text{fuel consumed by the energy converter}}$. If from the data submitted arises the need to differentiate C_{fN2O} by energy converter, then a C_{fN2O} expressed in $g_{N2O}/g_{\text{fuel delivered to the ship}}$ needs to be calculated trough the weighted average of the different C_{fN2O} taking in consideration the fuel consumed on each energy converter.

Additional information:

PART B – EMISSION FACTORS FOR FUEL SLIPPAGE (C_{slip})

This part should contain the data to support proposals for C_{slip} as defined in the LCA Guidelines;

Term	Units	Explanation
C_{slip_ship}	% of total fuel mass	Factor accounting for fuel (expressed in % of total fuel mass delivered to the ship) which escapes from the energy converter without being oxidized (including fuel that escapes from combustion chamber/oxidation process and from crankcase, as appropriate) $C_{slip\_ship}=C_{slip}*(1-C_{fug}/100)$
C_{slip}	% of total fuel mass	Factor accounting for fuel (expressed in % of total fuel mass consumed in the energy converter) which escapes from the energy converter without being oxidized (including fuel that escapes from combustion chamber/oxidation process and from crankcase, as appropriate)

1 METHODOLOGY

This section should clearly present the methodology for the measurements made and associated uncertainty.

Additional details and relevant information may be added in appendices, such as measurement procedures and equipment used, test-bed/onboard measurement, etc.

2 ENERGY CONVERTER DIFFERENTIATION

This section should clearly present the Energy converter differentiation (general model range)[44] shall be included in the proposed values, and the reasoning to follow such differentiation.

3 MAIN RESULTS

This section should present the results.

[44] Example: ICE/Piston Engines (2-Stroke, SSD/MSD), ICE/Piston Engines (4-Stroke, MSD), ICE/Piston Engines (4-Stroke, HSD), ICE/Gas Turbines (GT), Boilers, Dual Fuel, 4-stroke, Medium Speed, Low Pressure/Otto Cycle (LPMSDF 4-s Otto), Dual Fuel, 4-stroke, Medium Speed, High Pressure/Otto Cycle (HPMSDF 4-s Diesel), Dual Fuel, 2-stroke, Low Speed, Low Pressure/Otto Cycle (LPLSDF 2-s Otto), Dual Fuel (DF), 2-stroke, Low Speed, High Pressure/Diesel Cycle (HPLSDF 2-s Diesel), Gas-only, 4-stroke, Medium Speed, Low Pressure/Otto Cycle (LPMSGas 4-s Otto), Gas-only, 4-stroke, High Speed, Low Pressure/Otto Cycle (LPHSGas 4-s Otto), DF Boilers (DFB), Methane Reformer, (MRCH4), Methanol Reformer (MRCH3OH).

Table 2: Proposed values for C_{slip}

	Fuel[45]						C_{slip}[46]		
	Order	Group	Fuel type	Energy converter[47]	Test Cycle	Measurement Method[48]	$C_{slip\ Exhaust}$ [49]	$C_{slip\ Crankcase}$ [49]	Uncertainty
Example	31	LNG	Liquefied Natural Gas (Methane)	Low Pressure Four stroke medium speed Auxiliary engine	NTC - D2	Test-bed measurement	x%	y%	z%

Additional information:

PART C – EMISSION FACTORS FOR FUGITIVE EMISSIONS (C_{fug})

This part should contain the data to support proposals for C_{fug} as defined in the LCA Guidelines;

Term	Units	Explanation
C_{fug}	% of fuel mass	Factor accounting for the fuel (expressed in % of mass of the fuel delivered to the ship) which escapes between the tanks up to the energy converter which is leaked, vented or otherwise lost in the system

1 METHODOLOGY

This section should clearly present the methodology for the measurements made and associated uncertainty.

Additional details and relevant information may be added in appendices, such as measurement procedures and equipment used.

2 DEFAULT VALUES DIFFERENTIATION

This section should clearly present the proposed way-forward to differentiate fugitive emissions, for example per energy converter, re-liquefaction equipment or Ship type.

3 MAIN RESULTS

This section should present the results.

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45 Fuel pathways listed in appendix 1 of the LCA guidelines (resolution MEPC.391(81)).

46 $C_{slip} = C_{slip\_Exhaust} + C_{slip\_Crankcase}$

47 The proposal of default values should include a differentiation per energy converter with a technical explanation on how the Energy Converter classes were defined, , the make and model of the engine where the emission tests was carried out, including engine design year.

48 For example, a reference to ISO 8178 and NO_x Technical Code 2008. It should include the list of instruments used to measure emissions and test location (lab/onboard).

49 The proposed data should be expressed in $g_{CH4}/g_{\text{fuel consumed by the energy converter}}$.

Table 3: Proposed values for C_{fug}

	Fuel[50]						
	Order	Group	Fuel type	Fugitive Emissions Class[51]	Measurement Method[52]	C_{fug}[53]	Uncertainty
Example	31	LNG	Liquefied Natural Gas (Methane)	LNG Tanker	Onboard measurement	x%	y%

Additional information:

Part D – APPENDIX

Brief description of the procedures to collect data and the data collected used to calculated the proposed values, for example the emissions at each load point of the Test Cycle.

Part E – REFERENCES

REF (APA format)

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50 Fuel pathways listed in appendix 1 of the LCA guidelines (resolution MEPC.391(81)).

51 A differentiation may be proposed, for example for example per energy converter, re-liquefaction equipment or ship type.

52 For example a reference to ISO 8178 and NO_x Technical Code 2008. It should include the list of instruments used to measure emissions and test location (lab/onboard).

53 Expressed in % of mass of the fuel delivered to the ship.

ANNEX 11

TERMS OF REFERENCE FOR THE ESTABLISHMENT OF A VOLUNTARY MULTI-DONOR TRUST FUND TO SUSTAIN THE ORGANIZATION'S TECHNICAL COOPERATION AND CAPACITY-BUILDING ACTIVITIES TO SUPPORT THE IMPLEMENTATION OF THE 2023 IMO STRATEGY ON REDUCTION OF GHG EMISSIONS FROM SHIPS ("GHG TC TRUST FUND"), AS AMENDED

Establishment and authority of the Trust Fund

1 The "GHG TC Trust Fund", hereinafter called the "Trust Fund", is established by the Secretary-General under the International Maritime Organization's Financial Regulations 6.7 and 6.8 on 2 July 2019. The Trust Fund shall be administered in conformity with the Organization's Financial Regulations and Financial Rules. Management of the Trust Fund also requires observance of the Organization's Staff Regulations and Staff Rules, and other policies or procedures promulgated by the Secretary-General. Exceptions to such regulations, rules, policies or procedures are not permissible, unless specifically authorized by the Secretary-General.

Purpose of the Trust Fund

2 The purpose of the Trust Fund is to provide a "dedicated source of financial support for technical cooperation and capacity-building activities to support the implementation of the 2023 IMO Strategy on reduction of GHG emissions from ships" (2023 IMO GHG Strategy).

Contributions to the Trust Fund

3 The resources of the Trust Fund include:

.1 voluntary contributions from IMO Member States, UN Agencies, international organizations, and other entities having expressed their support for the objectives and aims of the IMO GHG Strategy; and

.2 any income arising from investments/balances of the Trust Fund.

4 A pledge to the Trust Fund may be accepted by the Directors of Administration, of the Marine Environment Division or of the Technical Cooperation and Implementation Division.

5 Contributions for the Trust Fund may be accepted in United States dollars, pounds sterling, euros or other fully convertible currencies. Contributions in currencies which are not convertible may be accepted, but only if the Director of Administration determines that the currency can be fully utilized in the implementation of the related activity. Contributions in kind are given an estimated monetary value by the Director of Administration at the time the pledges are received.

6 The making of a pledge and its acceptance are to be recorded in an exchange of letters, or, if deemed appropriate, in a more formal agreement, meeting minutes or reports.

7 The resources of the Trust Fund shall be kept in the following bank account:

IMO Bank Account details	Account No(s)	Sort-code
IMO DONOR FUNDS 2120 USD	41035071	609242

8 Contributions will normally be received for the purpose as described in paragraph 2 above. However, individual donors may indicate for which of the technical cooperation and capacity-building activities their contributions are preferably used. If such contribution cannot be used as intended, the donor will be consulted on its appropriate use.

Administration of the Trust Fund and spending authority

9 The Secretary-General designates the Marine Environment Division as the principal implementing office of the Trust Fund, which will be responsible for coordinating all aspects of the work programme to be financed from the Trust Fund.

10 In accordance with IMO financial regulation 10.2, no obligations or disbursements against any funds may be incurred without the written authorization of the Secretary-General or, on his or her behalf, the Director of Administration. Such authorizations take the form of allotments which will be issued only after sufficient contributions have been received to meet the requirements for initial financial obligations and for any reserves which may be required.

Audit

11 The Trust Fund is subject to audit by the appointed external auditors and the internal auditor of the Organization, under article XII of IMO's Financial Regulations. No other additional or special audit arrangement shall be made with donors.

Reporting

12 IMO Financial Services will provide an annual financial statement showing income and expenditures as of 31 December each year with respect to the funds pledged and received.

13 All financial accounts and statements shall be expressed in the Organization's reporting currencies.

14 The Marine Environment Division will regularly report to the Marine Environment Protection Committee on the outcome of specific activities and projects funded through the Trust Fund.

Closure of the Trust Fund

15 The Trust Fund may be terminated when all of the programmes have been satisfactorily completed and agreed upon by all parties concerned.

16 Any other balances remaining at the time the Trust Fund is closed will be disposed of in a manner consistent with the purposes of the Trust Fund and with the Financial Regulations and Financial Rules of the Organization.

APPENDIX

OPERATIONAL PROCEDURES

Preparation of a programme implementation plan

1 A programme implementation document (PID) together with a corresponding cost plan is a prerequisite for the commencement of operations. The identified programme implementing officer will submit to the Contract Manager, for approval, the PID including costing, which represents a detailed budget and a plan of activities, clearly outlining the expected accomplishments and allocation of funds.

2 All cost plans for the Trust Fund, including those for operational activities, must include a provision for support costs at a rate approved by the Director of Administration.

Administration of the Trust Fund

3 For the purpose of ensuring proper financial controls, the Director of the Marine Environment Division shall be the implementing officer of the Trust Fund.

4 The Contract Manager shall be responsible for ensuring that the Trust Fund is utilized for the purpose as described in these terms of reference and the implementation of programme activities under the Trust Fund.

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ANNEX 12

ILLUSTRATION OF A DRAFT POSSIBLE OUTLINE OF THE "IMO NET-ZERO FRAMEWORK"

Possible amendments to MARPOL Annex VI

Chapter 1 – General

.1 Definitions (regulation 2)

Chapter 2 – Survey, certification and means of control

.2 Surveys (regulation 5)

.3 Certificates and Statements of Compliance (regulation 6)

.4 Form of certificates and Statements of Compliance (regulation 8)

.5 Duration and validity of Certificates and Statements of Compliance (regulation 9)

.6 Port State control (regulation 10)

Chapter 4 – Regulations on the carbon intensity of international shipping

.7 SEEMP (regulation 26)

.8 Data Collection System (regulation 27)

[New Chapter 5 – Regulations on the IMO net-zero framework

.9 ***New Chapter 5.1: Goal-based marine fuel standard regulating the phased reduction of the marine fuel's GHG intensity***

.1 Application (regulation X)

.2 Goal (regulation X)

.3 Functional requirements (regulation X)

.4 Attained GHG fuel intensity (GFI) (regulation X)

.5 Target/Required GFI (regulation X)

.6 GFI data collection and reporting (regulation X)

.7 Alternative compliance approaches (regulation X)

.8 Central GFI Registry (regulation X)

.10 ***New Chapter 5.2: Economic mechanism(s) to incentivize the transition to net-zero***

.1 Application (regulation X)

.2 Calculation of economic contribution by ships (regulation X)

.3 Collection of economic contribution by ships (regulation X)

.4 Flexible compliance mechanism(s) (regulation X)

.5 Central management/oversight of collected revenue (regulation X)

.6 Distribution of revenue (regulation X)

.11 ***Review of the chapter]***

Appendices

.1 Appendix V (BDN)

.2 Appendix IX (DCS)

.3 Appendix X (Statement of Compliance)

+ ***Possible accompanying new guidelines and consequential amendments to existing guidelines***

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ANNEX 13

DRAFT AMENDMENTS TO MARPOL ANNEX VI

(Designation of the Canadian Arctic and the Norwegian Sea as Emission Control Areas for Nitrogen Oxides, Sulphur Oxides and Particulate Matter, as appropriate)

ANNEX VI

REGULATIONS FOR THE PREVENTION OF AIR POLLUTION FROM SHIPS

Regulation 13
Nitrogen oxides (NO_x)

…

Tier III

1 A new sub-paragraph .3 is added to regulation 13.5.1.2 as follows:

".3 1 March 2026 and is operating in the Norwegian Sea Emission Control Area. For the Norwegian Sea Emission Control Area, ship constructed on or after 1 March 2026 means:

.1 for which the building contract is placed on or after 1 March 2026; or

.2 in the absence of a building contract, the keel of which is laid, or which is at a similar stage of construction on or after 1 September 2026; or

.3 the delivery of which is on or after 1 March 2030."

2 At the end of regulation 13.5.1.3, "." is replaced with ":" and a new sub-paragraph .1 is added as follows:

".1 that ship is constructed on or after 1 January 2025 and is operating in the Canadian Arctic Emission Control Area."

Emission control area

3 At the end of sub-paragraph .3 of regulation 13.6, the word "and" is deleted and at the end of sub-paragraph .4, "." is replaced with ";"

4 New sub-paragraphs .5 and .6 are added to regulation 13.6 as follows:

".5 the Canadian Arctic Emission Control Area, which means the area described by the coordinates provided in appendix VII to this Annex; and

.6 the Norwegian Sea as defined in regulation 13.9.4 of Annex II of the present Convention."

Regulation 14
Sulphur oxides (SO_x) and particulate matter
Requirements within emission control areas

5 At the end of sub-paragraph .4 of regulation 14.3, the word "and" is deleted and at the end of sub-paragraph .5, "." is replaced by ";".

6 New sub-paragraphs .6 and .7 of regulation 14.3 as follows:

".6 the Canadian Arctic Emission Control area, which means the area described by the coordinates provided in appendix VII to this Annex; and

.7 the Norwegian Sea as defined in regulation 13.9.4 of Annex II of the present Convention."

Appendix VII
Emission control areas
(regulations 13.6 and 14.3)

7 Paragraph 1 is replaced by the following:

"1 The boundaries of emission control areas designated under regulations 13.6 and 14.3, other than the Baltic Sea, the North Sea, and Norwegian Sea areas, are set forth in this appendix."

8 A new paragraph 5 is added after paragraph 4 as follows:

"5 The Canadian Arctic area comprises two segments starting at the:

.1 Yukon mainland at 68°54'.00 N, 137°0'.00 W; following the coordinates listed below and ending at the north coast of Hans Island at 80°49'.91 N, 66°27'.40 W, connected by geodesic lines connecting the following coordinates in World Geodetic System 1984 (WGS84) datum:

POINT	LATITUDE	LONGITUDE
1	68°54'.00 N	137°0'.00 W
2	72°56'.58 N	137°0'.00 W
3	73°0'.42 N	136°21'.72 W
4	73°21'.72 N	136°20'.46 W
5	73°56'.34 N	136°57'.60 W
6	74°30'.18 N	137°13'.08 W
7	75°3'.42 N	137°7'.20 W
8	75°49'.26 N	136°32'.04 W
9	76°42'.18 N	136°57'.06 W
10	77°28'.26 N	136°34'.74 W
11	78°7'.26 N	135°28'.50 W
12	78°39'.72 N	133°44'.88 W
13	79°29'.58 N	131°24'.96 W
14	79°53'.16 N	129°32'.22 W
15	80°31'.44 N	127°33'.48 W

POINT	LATITUDE	LONGITUDE
16	81°54'.36 N	118°36'.24 W
17	82°16'.32 N	116°28'.98 W
18	82°52'.86 N	115°29'.46 W
19	83°54'.54 N	112°7'.20 W
20	85°46'.14 N	97°16'.86 W
21	86°9'.78 N	89°14'.46 W
22	86°22'.56 N	78°59'.58 W
23	86°19'.18 N	60°10'.17 W
24	85°38'.92 N	58°10'.58 W
25	85°22'.29 N	57°59'.22 W
26	85°12'.04 N	57°54'.68 W
27	84°49'.56 N	57°13'.28 W
28	84°22'.15 N	56°43'.09 W
29	84°17'.32 N	56°35'.78 W
30	84°11'.05 N	56°29'.53 W
31	83°10'.79 N	57°0'.21 W
32	83°4'.29 N	57°27'.78 W
33	83°0'.95 N	57°32'.72 W
34	82°44'.71 N	58°0'.38 W
35	82°42'.57 N	58°6'.78 W
36	82°40'.69 N	58°11'.74 W
37	82°34'.95 N	58°25'.30 W
38	82°31'.25 N	58°38'.56 W
39	82°27'.52 N	58°50'.12 W
40	82°22'.87 N	59°2'.00 W
41	82°20'.26 N	59°21'.38 W
42	82°18'.54 N	59°32'.25 W
43	82°17'.22 N	59°41'.31 W
44	82°14'.41 N	59°56'.06 W
45	82°12'.06 N	60°2'.23 W
46	81°51'.67 N	62°9'.60 W
47	81°17'.89 N	64°8'.73 W
48	80°50'.48 N	66°15'.33 W
49	80°50'.10 N	66°26'.97 W
50	80°49'.91 N	66°27'.40 W

.2 continuing from the south coast of Hans Island at 80°49'.29 N, 66°27'.04 W, following the coordinates listed below, and ending at the coast of Newfoundland and Labrador at 60°0'.00 N, 64°9'.60 W, connected by geodesic lines connecting the following coordinates in World Geodetic System 1984 (WGS84) datum:

POINT	LATITUDE	LONGITUDE
51	80°49'.29 N	66°27'.04 W
52	80°49'.19 N	66°26'.57 W

POINT	LATITUDE	LONGITUDE
53	80°45'.43 N	67°3'.99 W
54	80°26'.16 N	68°14'.39 W
55	80°1'.79 N	68°46'.99 W
56	79°40'.38 N	69°4'.68 W
57	78°48'.09 N	72°52'.36 W
58	78°25'.05 N	73°45'.66 W
59	77°30'.83 N	74°38'.24 W
60	76°43'.47 N	74°56'.49 W
61	75°0'.00 N	73°16'.07 W
62	74°50'.67 N	73°2'.71 W
63	74°44'.20 N	72°52'.86 W
64	74°28'.67 N	71°45'.72 W
65	74°24'.02 N	71°25'.67 W
66	74°12'.42 N	70°33'.06 W
67	74°10'.03 N	70°23'.12 W
68	74°7'.50 N	70°12'.16 W
69	74°6'.15 N	70°6'.69 W
70	74°2'.53 N	69°51'.43 W
71	74°2'.25 N	69°50'.33 W
72	73°57'.54 N	69°31'.02 W
73	73°52'.27 N	69°10'.88 W
74	73°46'.73 N	68°51'.14 W
75	73°46'.17 N	68°48'.81 W
76	73°41'.77 N	68°29'.65 W
77	73°37'.91 N	68°12'.34 W
78	73°36'.51 N	68°5'.42 W
79	73°31'.14 N	67°15'.52 W
80	73°25'.90 N	66°24'.99 W
81	73°18'.48 N	66°7'.91 W
82	72°50'.89 N	65°7'.52 W
83	72°47'.70 N	65°0'.63 W
84	72°45'.76 N	64°58'.22 W
85	72°43'.78 N	64°54'.27 W
86	72°36'.40 N	64°38'.74 W
87	72°30'.58 N	64°26'.04 W
88	72°24'.89 N	64°13'.11 W
89	72°10'.96 N	63°40'.55 W
90	72°6'.33 N	63°30'.42 W
91	72°1'.65 N	63°20'.73 W
92	71°52'.98 N	63°3'.86 W
93	71°47'.21 N	62°52'.67 W
94	71°44'.71 N	62°49'.41 W
95	71°32'.90 N	62°33'.35 W
96	71°31'.73 N	62°31'.66 W

POINT	LATITUDE	LONGITUDE
97	71°29'.39 N	62°28'.99 W
98	71°25'.93 N	62°25'.37 W
99	71°18'.98 N	62°17'.45 W
100	71°12'.10 N	62°8'.98 W
101	70°51'.84 N	61°42'.53 W
102	70°48'.17 N	61°37'.62 W
103	70°35'.55 N	61°20'.28 W
104	70°33'.07 N	61°17'.10 W
105	70°13'.48 N	61°10'.49 W
106	70°8'.83 N	61°8'.67 W
107	70°7'.55 N	61°7'.92 W
108	70°1'.68 N	61°4'.08 W
109	69°55'.82 N	60°59'.85 W
110	69°55'.27 N	60°59'.41 W
111	69°49'.82 N	60°57'.99 W
112	69°29'.41 N	60°51'.36 W
113	69°12'.82 N	60°27'.40 W
114	69°10'.24 N	60°23'.47 W
115	69°6'.79 N	60°18'.33 W
116	69°0'.88 N	60°8'.99 W
117	68°56'.83 N	60°2'.21 W
118	68°38'.02 N	59°14'.43 W
119	68°37'.86 N	59°14'.01 W
120	68°34'.02 N	59°4'.46 W
121	68°32'.88 N	59°1'.49 W
122	68°25'.25 N	58°42'.06 W
123	68°21'.67 N	58°38'.64 W
124	68°16'.07 N	58°33'.75 W
125	68°7'.40 N	58°26'.93 W
126	68°6'.87 N	58°26'.58 W
127	68°4'.26 N	58°24'.69 W
128	68°1'.89 N	58°23'.15 W
129	67°56'.94 N	58°19'.62 W
130	67°44'.25 N	58°9'.79 W
131	67°39'.77 N	58°6'.05 W
132	67°35'.33 N	58°2'.07 W
133	67°30'.76 N	57°57'.66 W
134	67°29'.16 N	57°56'.00 W
135	67°28'.21 N	57°55'.01 W
136	67°27'.27 N	57°54'.57 W
137	67°21'.52 N	57°52'.35 W
138	66°49'.47 N	57°42'.84 W
139	66°41'.71 N	57°40'.35 W
140	66°37'.88 N	57°39'.45 W

POINT	LATITUDE	LONGITUDE
141	66°36'.02 N	57°38'.99 W
142	66°30'.27 N	57°38'.04 W
143	66°24'.50 N	57°37'.56 W
144	66°18'.68 N	57°37'.55 W
145	66°12'.84 N	57°38'.01 W
146	66°3'.50 N	57°39'.45 W
147	65°57'.62 N	57°39'.93 W
148	65°57'.50 N	57°39'.93 W
149	65°51'.75 N	57°40'.44 W
150	65°50'.81 N	57°40'.46 W
151	65°37'.59 N	57°41'.74 W
152	65°34'.74 N	57°42'.18 W
153	65°23'.33 N	57°44'.83 W
154	65°18'.08 N	57°45'.70 W
155	65°14'.52 N	57°44'.99 W
156	65°11'.49 N	57°44'.22 W
157	65°8'.79 N	57°43'.69 W
158	65°6'.04 N	57°43'.95 W
159	64°12'.06 N	57°48'.09 W
160	64°4'.20 N	57°49'.01 W
161	63°57'.36 N	57°53'.40 W
162	63°52'.57 N	57°56'.46 W
163	63°50'.05 N	57°57'.01 W
164	63°43'.99 N	57°58'.60 W
165	63°37'.16 N	58°1'.00 W
166	63°35'.02 N	58°1'.86 W
167	63°28'.62 N	57°59'.62 W
168	63°22'.86 N	57°57'.29 W
169	62°47'.14 N	57°40'.83 W
170	62°11'.35 N	57°25'.12 W
171	62°3'.47 N	57°22'.15 W
172	62°2'.23 N	57°21'.62 W
173	62°0'.39 N	57°20'.92 W
174	61°24'.74 N	57°16'.16 W
175	61°10'.14 N	57°38'.70 W
176	60°43'.56 N	57°17'.64 W
177	60°15'.36 N	57°4'.56 W
178	60°0'.00 N	56°43'.02 W
179	60°0'.00 N	64°9'.60 W

"

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ANNEX 14

STATUS REPORT OF THE OUTPUTS OF MEPC FOR THE 2024-2025 BIENNIUM

MARINE ENVIRONMENT PROTECTION COMMITTEE (MEPC)									
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ	Status of output for Year 1	Status of output for Year 2	References
1. Ensure implementation of IMO instruments supported by capacity development	1.2	Input on identifying emerging needs of developing countries, in particular SIDS and LDCs to be included in the ITCP	Continuous	TCC	MSC / MEPC / FAL / LEG		Ongoing		MEPC 81/16, section 12
1. Ensure implementation of IMO instruments supported by capacity development	1.4	Analysis of consolidated audit summary reports	Annual	Assembly	MSC / MEPC / LEG / TCC / III	Council	Ongoing		MEPC 81/16, paras. 2.20, 2.21 and 10.7
1. Ensure implementation of IMO instruments supported by capacity development	1.5	Non-exhaustive list of obligations under instruments relevant to the IMO Instruments Implementation Code (III Code)	Annual	MSC / MEPC	III		Completed		MEPC 81/16, para. 10.9

MARINE ENVIRONMENT PROTECTION COMMITTEE (MEPC)									
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ	Status of output for Year 1	Status of output for Year 2	References
1. Ensure implementation of IMO instruments supported by capacity development	1.7	Identify thematic priorities within the area of maritime safety and security, marine environmental protection, facilitation of maritime traffic and maritime legislation	Annual	TCC	MSC / MEPC / FAL / LEG		Completed		MEPC 81/16, section 12
1. Ensure implementation of IMO instruments supported by capacity development	1.9	Report on activities within the ITCP related to the OPRC Convention and the OPRC-HNS Protocol	Annual	TCC	MEPC		Completed		MEPC 81/16, section 12
1. Ensure implementation of IMO instruments supported by capacity development	1.11	Measures to harmonize port State control (PSC) activities and procedures worldwide	Continuous	MSC / MEPC	HTW / PPR / NCSR	III	Ongoing		MEPC 81/16, paras. 10.5, 10.6 and 10.9
1. Ensure implementation of IMO instruments supported by capacity development	1.14	Development of guidance in relation to Mandatory IMO Member State Audit Scheme (IMSAS) to assist in the implementation of the III Code by Member States	2024	MSC / MEPC	III		In progress		MEPC 81/16, para. 10.8
Note: MEPC 81 approved, subject to a concurrent decision by MSC 108, the MSC-MEPC.2 circular on *Guidance in relation to the IMO Member State Audit Scheme (IMSAS) to assist in the implementation of the III Code by Member States.*									

MARINE ENVIRONMENT PROTECTION COMMITTEE (MEPC)									
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ	Status of output for Year 1	Status of output for Year 2	References
1. Ensure implementation of IMO instruments supported by capacity development	1.16	Review of the 2014 Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life (MEPC.1/Circ.833) (2014 Guidelines) and identification of next steps	2024	MEPC	SDC		In progress		MEPC 81/16 paras. 10.11 to 10.16
Note: MEPC 81 endorsed, in principle, the draft *Action plan for the reduction of underwater noise from commercial shipping* (MEPC 81/WP.10, annex 1; and SDC 10/17, annex 2), with a view to further consideration and final approval at MEPC 82 (MEPC 81/16, para. 10.16.1.)									
1. Ensure implementation of IMO instruments supported by capacity development	1.18	Development of guidance on assessments and applications of remote surveys, ISM Code audits and ISPS Code verifications	2024	MSC/ MEPC	III		In progress		III 9/19, section 12; MEPC 81/16, para. 10.1
1. Ensure implementation of IMO instruments supported by capacity development	1.21	Development of guidance on matters relating to in-water cleaning	2025	MEPC	PPR		In progress		MEPC 81/16, para.15.24

MARINE ENVIRONMENT PROTECTION COMMITTEE (MEPC)									
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ	Status of output for Year 1	Status of output for Year 2	References
1. Ensure implementation of IMO instruments supported by capacity development	1.23	Evaluation and harmonization of rules and guidance on the discharge of discharge water from EGCS into the aquatic environment, including conditions and areas	2025	MEPC	PPR		In progress		MEPC 81/16, paras.5.3, 5.4, 5.20, 5.21, 9.2 and 9.3
1. Ensure implementation of IMO instruments supported by capacity development	1.24	Review of the BWM Convention based on data gathered in the experience-building phase	2025	MEPC			In progress		MEPC 81/16, section 4
1. Ensure implementation of IMO instruments supported by capacity development	1.25	Urgent measures emanating from issues identified during the experience-building phase of the BWM Convention	2025	MEPC			In progress		MEPC 81/16, section 4
1. Ensure implementation of IMO instruments supported by capacity development	1.26	Revision of MARPOL Annex IV and associated guidelines	2025	MEPC	III / HTW	PPR	In progress		MEPC 81/16, paras. 15.20 and 15.21

MARINE ENVIRONMENT PROTECTION COMMITTEE (MEPC)									
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ	Status of output for Year 1	Status of output for Year 2	References
2. Integrate new, emerging and advancing technologies in the regulatory framework	2.2	Approved ballast water management systems which make use of Active Substances, taking into account recommendations of the GESAMP-BWWG	Annual	MEPC			Ongoing		MEPC 81/16, paras. 4.8 to 4.12
2. Integrate new, emerging and advancing technologies in the regulatory framework	2.13	Review of the IBTS Guidelines and amendments to the IOPP Certificate and Oil Record Book	2025	MEPC	PPR		In progress		PPR 11/18, section 11; MEPC 81/16, para. 9.1
2. Integrate new, emerging and advancing technologies in the regulatory framework	2.15	Development of amendments to MARPOL Annex VI and the NOx Technical Code on the use of multiple engine operational profiles for a marine diesel engine and on the clarification of test cycles	2025	MEPC	PPR		In progress		PPR 11/18, section 8; MEPC 81/16, para. 9.1
3. Respond to climate change and reduce greenhouse gas emissions from international shipping	3.1	Treatment of ozone-depleting substances used by ships	Annual	MEPC			Completed		MEPC 81/16, para. 5.14

MARINE ENVIRONMENT PROTECTION COMMITTEE (MEPC)									
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ	Status of output for Year 1	Status of output for Year 2	References
3. Respond to climate change and reduce greenhouse gas emissions from international shipping	3.2	Further development of mechanisms needed to achieve the reduction of GHG emissions from international shipping	Annual	MEPC			Ongoing		MEPC 81/16, sections 6 and 7
3. Respond to climate change and reduce greenhouse gas emissions from international shipping	3.3	Reduction of the impact on the Arctic of emissions of Black Carbon from international shipping	2025	MEPC	PPR		In progress		MEPC 81/16, paras. 5.12 and 5.13
3. Respond to climate change and reduce greenhouse gas emissions from international shipping	3.4	Promotion of technical cooperation and transfer of technology relating to the reduction of GHG emissions from ships	2025	MEPC			In progress		MEPC 81/16, section 7
3. Respond to climate change and reduce greenhouse gas emissions from international shipping	3.5	Revision of guidelines concerning chapter 4 of MARPOL Annex VI	2025	MEPC			In progress		MEPC 81/16, section 6

MARINE ENVIRONMENT PROTECTION COMMITTEE (MEPC)									
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ	Status of output for Year 1	Status of output for Year 2	References
3. Respond to climate change and reduce greenhouse gas emissions from international shipping	3.6	EEDI reviews required under regulation 21.6 of MARPOL Annex VI	2025	MEPC			In progress		MEPC 81/16, section 6
3. Respond to climate change and reduce greenhouse gas emissions from international shipping	3.7	Further technical and operational measures for enhancing the energy efficiency of international shipping	2025	MEPC			In progress		MEPC 81/16, section 6
3. Respond to climate change and reduce greenhouse gas emissions from international shipping	3.8	Development of a safety regulatory framework to support the reduction of GHG emissions from ships using new technologies and alternative fuels	Continuous	MSC	MEPC / CCC / HTW / III / SSE / SDC		No work requested by MSC		
4. Continue to engage in ocean governance	4.1	Identification and protection of Special Areas, ECAs and PSSAs and associated protective measures	Continuous	MEPC	NCSR		Ongoing		MEPC 81/16, section 11
4. Continue to engage in ocean governance	4.2	Input to the ITCP on emerging issues relating to sustainable development and achievement of the SDGs	Continuous	TCC	MSC / MEPC /FAL / LEG		Ongoing		MEPC 81/16, section 12

MARINE ENVIRONMENT PROTECTION COMMITTEE (MEPC)									
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ	Status of output for Year 1	Status of output for Year 2	References
4. Continue to engage in ocean governance	4.3	Follow-up work emanating from the Action Plan to Address Marine Plastic Litter from Ships	2025	MEPC	PPR / III / HTW		In progress		MEPC 81/16, section 8
6. Address the human element	6.1	Role of the human element	Continuous	MSC / MEPC	III / PPR / CCC / SDC / SSE / NCSR	HTW	Ongoing		MSC 89/25, paragraphs 10.10, 10.16 and 22.39 and annex 21; MEPC 78/17, paras. 10.4 and 13
6. Address the human element	6.2	Validated model training courses	Continuous	MSC / MEPC	III / PPR / CCC / SDC / SSE / NCSR	HTW	Ongoing		MSC 107/20, paras. 13.3, 13.4 and 14.32
6. Address the human element	6.10	Development of an entrant training manual for PSC personnel	2025	MSC / MEPC	III		In progress		MEPC 81/16, para. 10.1
7. Ensure the regulatory effectiveness of international shipping	7.1	Unified interpretation of provisions of IMO safety, security, environment, facilitation, liability and compensation-related conventions	Continuous	MSC / MEPC / FAL / LEG	III / PPR / CCC / SDC / SSE / NCSR		Ongoing		MEPC 81/16, paras. 3.17, 6.1, 6.7, 6.37 and 6.38
7. Ensure the regulatory effectiveness of international shipping	7.3	Safety and pollution hazards of chemicals and preparation of consequential amendments to the IBC Code	Continuous	MEPC	PPR		Ongoing		PPR 11/18, section 3; MEPC 81/16, para. 9.1

MARINE ENVIRONMENT PROTECTION COMMITTEE (MEPC)									
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ	Status of output for Year 1	Status of output for Year 2	References
7. Ensure the regulatory effectiveness of international shipping	7.4	Lessons learned and safety issues identified from the analysis of marine safety investigation reports	Annual	MSC / MEPC	III		Ongoing		MEPC 81/16, para. 10.4
7. Ensure the regulatory effectiveness of international shipping	7.5	Identified issues relating to the implementation of IMO instruments from the analysis of data	Annual	MSC / MEPC	III		Ongoing		MEPC 81/16, para. 6.3 to 6.12 and 10.3
7. Ensure the regulatory effectiveness of international shipping	7.7	Consideration and analysis of reports on alleged inadequacy of port reception facilities	Annual	MEPC	III		Ongoing		III 9/19, section3; MEPC 81/16, para. 10.1
7. Ensure the regulatory effectiveness of international shipping	7.8	Monitoring the worldwide average sulphur content of fuel oils supplied for use on board ships	Annual	MEPC			On going		MEPC 81/16, paras. 5.3 and 5.4
7. Ensure the regulatory effectiveness of international shipping	7.11	Development of measures to reduce risks of use and carriage of heavy fuel oil as fuel by ships in Arctic waters	2024	MEPC	PPR		In progress		PPR 11/18, section 10; MEPC 81/16, para. 9.1
7. Ensure the regulatory effectiveness of international shipping	7.16	Development of a guide compiling best practices to develop local-level marine spill contingency plans to aid States, particularly local	2025	MEPC	PPR		In progress		PPR 11/18, section 9; MEPC 81/16, para. 9.1

MARINE ENVIRONMENT PROTECTION COMMITTEE (MEPC)									
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ	Status of output for Year 1	Status of output for Year 2	References
		governments and key institutions, in implementing the OPRC Convention and OPRC-HNS Protocol							
7. Ensure the regulatory effectiveness of international shipping	7.27	Updated Survey Guidelines under the Harmonized System of Survey and Certification (HSSC)	Annual	MSC / MEPC	III		Ongoing		MEPC 81/16, para. 10.9
7. Ensure the regulatory effectiveness of international shipping	7.28	Consideration of reports of incidents involving dangerous goods or marine pollutants in packaged form on board ships or in port areas	Annual	MSC / MEPC	III	CCC	Ongoing		CCC 9/14, section 9
7. Ensure the regulatory effectiveness of international shipping	7.38 (New)	Amendments to MARPOL Annex II in order to improve the effectiveness of cargo tank stripping, tank washing operations and prewash procedures for products with a high melting point and/or high viscosity	2025	MEPC	PPR		In progress		PPR 11/18, section 4; MEPC 81/16, para. 9.1
7. Ensure the regulatory effectiveness of international shipping	7.43	Revision of regulation 13.2.2 of MARPOL Annex VI to clarify that a marine diesel engine replacing a boiler shall be considered a replacement engine.	2024	MEPC		PPR	Completed		MEPC 81/16, section 3

MARINE ENVIRONMENT PROTECTION COMMITTEE (MEPC)									
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ	Status of output for Year 1	Status of output for Year 2	References
Note: MEPC 81 adopted the *2024 Guidelines as required by regulation 13.2.2 of MARPOL Annex VI in respect of non-identical replacement engines not required to meet the Tier III limit* (resolution MEPC.386(81)) (MEPC 81/16, para. 3.35)									
8. Ensure organizational effectiveness	8.1	Endorsed proposals for the development, maintenance and enhancement of information systems and related guidance (GISIS, websites, etc.)	Continuous	Council	MSC / MEPC / FAL / LEG / TCC		Ongoing		MEPC 81/16, paras. 6.3 to 6.7, 10.2, 10.4, 15.2 to 15.8
8. Ensure organizational effectiveness	8.3	Analysis and consideration of reports on partnership arrangements for, and implementation of, environmental programmes	Annual	TCC	MEPC		Ongoing		MEPC 81/16, section 12
8. Ensure organizational effectiveness	8.9	Revised documents on organization and method of work, as appropriate	Annual	Council	MSC / FAL / LEG / TCC / MEPC		Ongoing		MEPC 81/16, section 13
8. Ensure organizational effectiveness	8.12	Consideration for the enhancement and improvement of multilingualism and the language services at IMO	Continuous	Council	MSC / MEPC / FAL / LEG / TCC		Ongoing		MEPC 81/16, para. 15.25
OW. Other work	OW.3	Endorsed proposals for new outputs for the 2024-2025 biennium as accepted by the Committees	Annual	Council	MSC / MEPC / FAL / LEG / TCC		Ongoing		MEPC 81/16, section 14

MARINE ENVIRONMENT PROTECTION COMMITTEE (MEPC)									
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ	Status of output for Year 1	Status of output for Year 2	References
OW. Other work	OW.8	Cooperate with the United Nations on matters of mutual interest, as well as provide relevant input/guidance	Continuous	Assembly	MSC / MEPC / FAL / LEG / TCC	Council	Ongoing		MEPC 81/16, paras. 7.1 to 7.3, 15.1 and 15.9 to 15.19
OW. Other work	OW.9	Cooperate with other international bodies on matters of mutual interest, as well as provide relevant input/guidance	Continuous	Assembly	MSC / MEPC / FAL / LEG / TCC	Council	Ongoing		MEPC 81/16, section 7

ACCEPTED OUTPUTS ON THE POST-BIENNIAL AGENDA OF MEPC

MARINE ENVIRONMENT PROTECTION COMMITTEE (MEPC)								
ACCEPTED POST-BIENNIAL OUTPUTS				Parent organ(s)	Associated organ(s)	Coordinating organ	Timescale	Reference
No.	Biennium*	Reference to strategic direction, if applicable	Description					
1	2016-2017	7. Ensure regulatory effectiveness	Development of amendments to regulation 19 of MARPOL Annex VI and development of an associated Exemption Certificate for the exemption of ships not normally engaged on international voyages	MEPC	III		2 sessions	MEPC 71/17, paragraph 14.15
2	2022-2023	7. Ensure regulatory effectiveness	Revision of the *Revised guidelines and specifications for pollution prevention equipment for machinery space bilges of ships* (resolution MEPC.107(49))	MEPC	PPR		2 sessions	MEPC 79/16, paragraph12.8
3	2022-2023	7. Ensure regulatory effectiveness	Amendments to the *2017 Guidelines addressing additional aspects of the NO_X Technical Code 2008 with regard to particular requirements related to marine diesel engines fitted with Selective Catalytic Reduction (SCR) systems* (resolution MEPC.291(71), as amended by resolution MEPC.313(74))	MEPC	PPR		1 session	MEPC 80/17, paragraph 14.2
4	2022-2023	7. Ensure regulatory effectiveness	Amendments to the NO_X Technical Code 2008 with regard to re-certification procedures of existing marine diesel engines onboard of ships	MEPC	PPR		1 session	MEPC 80/17, paragraph 14.2

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* Biennium when the output was placed on the post-biennial agenda.

ANNEX 15

ITEMS TO BE INCLUDED IN THE AGENDA OF MEPC 82

No.	Item
1	Adoption of the agenda
2	Decisions of other bodies
3	Consideration and adoption of amendments to mandatory instruments
4	Harmful aquatic organisms in ballast water
5	Air pollution prevention
6	Energy efficiency of ships
7	Reduction of GHG emissions from ships
8	Follow-up work emanating from the Action Plan to address marine plastic litter from ships
9	Reduction of underwater radiated noise from commercial shipping
10	Pollution prevention and response
11	Reports of other sub-committees
12	Identification and protection of Special Areas, ECAs and PSSAs
13	Application of the Committees' method of work
14	Work programme of the Committee and subsidiary bodies
15	Election of the Chair and Vice-Chair
16	Any other business
17	Consideration of the report of the Committee

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ANNEX 16

STATEMENTS BY DELEGATIONS AND OBSERVERS*

ITEM 1

Opening statements

Statement by the delegation of Australia

"Australia's thoughts are with the families of the two Filipino and one Vietnamese seafarer killed by the Houthi attack on the Barbados-flagged bulk carrier TRUE CONFIDENCE. This Organization should not let a day pass without thinking of the seafarers who are being subject to missile and drone attacks.
These attacks purposefully target civilians, and those involved in the attacks know that the only injury and death on board these civilian ships will be of civilian seafarers. As well as targeting civilians, the attacks also erode navigational rights and freedoms, damage international trade, and increase broader maritime security risks such as piracy.
The Houthi attack on the TRUE CONFIDENCE came only a week after the attack and subsequent sinking of the Belize-flagged RUBYMAR, which resulted in the spilling of large amounts of oil and fertilizer into the marine environment. Also of relevance to this Committee - another impact of these attacks is increased emissions as shipping takes less efficient routes to avoid attack.
Australia thanks Bahamas and Japan for raising once again the plight of the GALAXY LEADER and the impact Houthi attacks on shipping more broadly. We applaud them for their leadership and perseverance championing the welfare of the 25 crew kept four months in captivity.
We also thank the Secretary General for the IMO's engagement on leadership on this matter.
We are concerned that the Houthis have assistance carrying out their attacks. Australia draws the attention of member states to Security Council Resolution 2722. Australia remains committed to upholding the rules-based order and the principle of freedom of navigation.
Separately, Australia 's thoughts are with the 23 crew of the Bangladesh-flagged vessel MV ABDULLAH that has been hijacked off the Somali coast. It underscores the work of this Organization to make trade and travel by sea as safe and secure as possible."

Statement by the delegation of the Bahamas

"Thank you Chair, Secretary-General, Excellencies, Distinguished Delegates present and online, NGO's and IGO's Observers, Greetings.
Chair, as we begin the 81st Session of the MEPC, The Bahamas join with the Secretary- General, Member-States, the International Transport Workers' Federation (ITF) and the Shipping Industry in expressing our profound sympathy to the family and loved ones of the three innocent Seafarers who lost their lives, and pray for the innocent seafarers, who were injured in that incident.
Killed and injured for simply doing their jobs when the "M/V True Confidence", a Barbados Registered Dry Bulk Carrier IMO #9460784, enroute from China to Saudi Arabia was struck by an Anti-Ship Missile on Wednesday 06th March in the Gulf of Aden.

* Statements have been included in this annex as provided by delegations/observers, in the order in which they were given, sorted by agenda item, and in the language of submission (including translation into any other language if such translation was provided). Statements are accessible in all official languages on audio file at: http://docs.imo.org/Meetings/Media.aspx

The Bahamas thanks all involved in the rescue efforts, including the Indian Navy, which took the survivors and injured to hospital in Djibouti. To the Delegation of the Philippines and Vietnam, our prayers are with you.
Chair, this unfortunate, yet predictable incident, represents some 40 unnecessary and unprovoked attacks on International Shipping in the Red Sea, and the Gulf of Aden, since The Bahamas Registered Galaxy Leader and its crew of 25 was Hijacked by armed Militants on the 19th November last year.
Chair, The Bahamas also wish to convey profound thanks to the Indian Navy for the use of special commandos on one of its warships to rescue the Maltese flagged cargo vessel MV Ruen this past Saturday, also apprehend 35 Somali pirates, and free all 17 courageous seafarers, who were detained since the hijacking of the vessel in the Indian Ocean on December 14th last year.
Chair, in keeping with the focus of this MEPC Committee, we Just witnessed the sinking of the Belize-Flagged Cargo Ship Rubymar on 02nd March, with some 21,000 Metric tonnes of Fertiliser onboard and causing an Eighteen-mile oil slick. The dissipation of the cargo and the effect of the oil slick together has the potential to cause serious environmental damage to this Ecological Sensitive Area.
Chair, in addition, "Emissions are expected to increase significantly as shipping lines avoid the Suez Canal and their vessels take the long route around southern Africa, adding some 3,000 nautical miles. The added fuel consumption could be more than 1,000 tonnes for some vessels, a situation not favourable for the IMO's, 2023 Revised Strategy of Reducing Emissions from International Shipping, with some 3.15 tonnes of CO_2 emitted for each tonne of fuel burned for every ship that goes South of Africa instead of via Suez… double that for a round trip Suez voyage."
Chair, the Red Sea crisis is directly responsible for Cargo Shipping delays and price increases in the short term, which we all will have to pay. No nation will be excluded because all nations rely on International Shipping from one degree or another.
International Shipping is dependent on the bravery and willingness of our Seafarers to serve.
The Bahamas remains concerned for the safety of shipping and for the safety of seafarers, who are now risking their lives in order to provide security of the world's supply of food and other essential goods.
The Bahamas reiterates the United Nations Security Council Resolution 2722 of January 10th, 2024: and strongly condemns Houthi attacks on Red Sea shipping, including those that undermine navigational rights. Upholding freedom of navigation in the Red Sea is vital to the free flow of global commerce and of regional security.
The Bahamas calls upon each delegation to use its influence to help to restore the safety, security, and the protection to international shipping and for our innocent seafarers. Finally, Chair, The Bahamas calls upon the Houthis to release unconditionally the Galaxy Leader and her crew. These unlawful attacks must stop.
Kindly append this statement to the final report of MEPC 81."

Statement by the delegation of Bangladesh

"Thank you Mr. Chair and good morning to all distinguished delegates joining MEPC81 physically and online, all set to negotiate the implementation of the 2023 IMO GHG Reduction strategy, towards a net zero by or around 2050.
I join the SG and others in expressing my delegation's sincere condolences to the delegation of the Philippines and Viet Nam for the recent attack on their seafarers onboard MV True confidence and loss of their seafarers in the red sea. Bd joins in condemning such unacceptable attacks and hostage-taking of innocent seafarers. We thank the Indian navy for their skilful support to ensure maritime security at the red sea and the Indian Ocean, and are relieved to congratulating the Indian navy for the successful rescue of MV Ruen and its seafarers. We also endorsed the concerns expressed by the Bahamas delegation to restore safety, security in international shipping.

Mr, Chair, I take the floor this morning with a heavy heart and grave concern, to bring to the notice of this committee of the recent hijacking incident in the Indian ocean of a Bangladeshi flag vessel, MV Abdullah IMO number-9745598 which was attacked and hijacked by a group of 15-20 Somali pirates in the early hours of 11 March 2024 around 450-500 NM off the coast of Somalia. All 23 Bangladesh seafarers on board MV Abdullah were taken hostage by the pirates. The vessel was enroute from Mozambique to Al- Humayra port of UAE carrying 55,000 Metric tonnes of Coal cargo. Subsequently, by 15 March the Bangladesh flag vessel was steered to the Somali coast and anchored in the internal waters of Somalia whilst keeping the Seafarers captive and hostage by the pirates.

The fate, safety and wellbeing of the 23 Bangladeshi seafarers on board hijacked MV Abdullah is unknown but assumed to be under severe duress and safety threat as their families and the Government of Bangladesh remain deeply concerned about the sufferings and physical and mental distress of the captive seafarers.

Mr Chair, Bangladesh strongly condemns such incidents of international piracy and considers the same to be a gross violation of international law including the UNCLOS and the Djibouti Code of Conduct endangering the freedom of navigation and safety of commercial shipping and seafarers in international waters. Our delegation believes that such incidents severely undermine and harm the global supply chains as well as the safety and livelihoods of people and seafarers from the global South.

Government of Bangladesh is attaching highest priority to this piracy incident and demands that Bangladesh Flag Vessel MV Abdullah, 23 Bangladeshi seafarers and cargo on board be returned unconditionally and immediately back to their freedom of navigation and safety and all are returned to the normal passage of the scheduled voyage.

The Office of Bangladesh PR to the IMO has already notified the SG's Office and the Somali Government seeking all out support for the immediate rescue and release of the captive vessel unconditionally. In this regard, Bangladesh urges the IMO and its member states as well as all relevant international organisations and stakeholders including multinational security agencies such as UKMTO, EUNAVFOR and others to make all out efforts under international law to rescue our vessel and our seafarers at the earliest possible opportunity. We urge all concerned to keep the sea lines of communication safe for navigation for unhindered global maritime transportation to prevent future hijacking incidents.

Chair in this regard Bangladesh appreciates deployment of naval assets in the piracy infested areas by the EU, UK and Indian Navy for the de-escalation of the piracy situation.

We also commend the secretary general's efforts for restoration of peace and freedom of navigation in the Red Sea and for reiterating the importance of the safety of ships and seafarers under special circumstances in the Red Sea and its adjacent areas.

While we remain deeply concerned with the fate of MV Abdullah and our seafarers onboard, Bangladesh remains equally concerned with the fate and wellbeing of all those seafarers currently under Houthi's captivity. We express our solidarity with all those flag states and the vessels affected due to Houthi's militant attacks at the Red Sea and by piracy, in international waters including the pirate infested High risk Somali coast.

I thank you Mr. Chair for giving me the floor and request our statement be appended to the final report of this committee."

Statement by the delegation of Belgium (on behalf of the EU Member States)

"La Belgique voudrait tout d'abord exprimer son plein soutien au gouvernement du Bangladesh suite à la prise en otage du **MV Abdullah** par des pirates somaliens et demande la libération des 23 membres de son équipage et du navire sans délai.

La Belgique au nom des Etats Membres de l'Union Européenne condamne fermement les attaques menées par les Houthis contre les navires commerciaux, qui constituent des violations inacceptables du droit international et de la convention de l'OMI et représentent une menace pour la sécurité maritime et la paix dans la région.

Nous demandons la libération immédiate et inconditionnelle du **Galaxy Leader** et des 25 membres de son équipage.
Nous présentons nos sincères condoléances aux familles des victimes suite à l'attentat meurtrier perpétré contre le vraquier "True Confidence". Nos pensées vont aux blessés et aux marins, pour la plupart d'origine philippine, présents lors de l'attaque et qui n'auraient jamais dû subir un tel traumatisme dans le cadre de leur travail. Nous exprimons notre entière solidarité avec les autorités de la Barbade et les gouvernements philippin et vietnamien, dont les marins ont perdu la vie...
Nous tenons aussi à exprimer notre solidarité avec les gouvernements du Belize et du Royaume-Uni suite au naufrage du **'Rubymar'**. Nous sommes soulagés qu'il n'y ait pas eu de perte de vie humaine. Le Rubymar est le premier navire perdu depuis le début des attaques dans la région. Ces attaques, qui mettent en danger la vie de marins innocents tout en perturbant le commerce mondial, doivent cesser immédiatement.
L'Union Européenne se félicite de l'adoption de la résolution 2722 du Conseil de sécurité des Nations unies du 10 janvier, qui condamne fermement les attaques des Houthis en mer Rouge. Le maintien de la liberté de navigation en mer Rouge est essentiel à la libre circulation du commerce mondial et à la sécurité régionale. Comme le rappelle la résolution 2722 du Conseil de sécurité des Nations unies, les États ont le droit de défendre leurs navires contre ces attaques, conformément au droit international.
L'Union Européenne demande instamment aux Houthis de stopper cette escalade de violence en mer Rouge et dans l'ensemble de la région. Dans ce contexte, nous rappelons l'obligation de tous les États de respecter l'embargo sur les armes prévu par la résolution 2216 du Conseil de sécurité des Nations unies.
L'Union Européenne a lancé le 19 février l'opération défensive EUNAVFOR ASPIDES, qui a répondu à la nécessité de rétablir la sécurité maritime et la liberté de navigation dans un corridor maritime hautement stratégique. L'opération jouera un rôle clé dans la sauvegarde des intérêts commerciaux et de sécurité, non seulement dans l'intérêt de l'Union Européenne et de la communauté internationale au sens large, mais surtout dans la protection des marins et la sauvegarde de la liberté de navigation.
En plus d'attenter à la vie et à la sécurité des marins, ces attaques ont des conséquences non négligeables sur le climat et sur l'environnement marin.
En effet, nous regrettons les émissions atmosphériques supplémentaires générées par les milliers de navires qui sont contraints de changer leur route en empruntant le Cap de Bonne Espérance à cause de la situation actuelle en Mer Rouge.
Nous sommes également très préoccupés par le risque environnemental que les tonnes d'engrais transportées par le navire Rubymar et les fuites potentielles de son fuel représentent pour les écosystèmes marins de la Mer Rouge et, en particulier, pour ses récifs coralliens.
Nous demandons que cette déclaration soit jointe au rapport de ce sous-comité.
Merci Monsieur le Président."

Statement by the delegation of Belize

"Mr. Chairman, delegates, ladies, and gentlemen.
I am honoured to address this 81st session of the IMO's Marine Environment Protection Committee. As we come together to discuss ways to protect our oceans and marine life from the devastating effects of pollution, it is important to remember that our efforts are crucial in ensuring a sustainable future for generations to come.
However, amidst our discussions on environmental protection, I must bring to your attention a grave incident that occurred on the 18th of February 2024. A Belize-flagged ship the "Rubymar" was hit by two missiles whilst navigating through the Bab-el-Mandeb strait with direction northbound of the Red Sea. The impact was in the Engine Room and Cargo Hold No.5 leaving the ship partially sunk and drifting in direction to Hanish Islands.

This attack originating from Houthi-controlled territories in Yemen endangered the lives and safety of the 20 seafarers on board and threatens international commerce and maritime security.
We are of course thankful that the 20 seafarers on board the "Rubymar" were rescued by MV Lobivia and taken to Djibouti. The Government of Belize extends its sincere thanks to the Master of MV Lobivia and the authorities from Djibouti that assisted in the rescue. We are as well thankful to all those who assisted with the safe repatriation of the seafarers to their respective countries in compliance with international requirements.
But lets us not forget, Mr. Chairman, that the impact of these unprovoked, unjustified, and unprecedented attacks on international maritime vessels go well beyond the flags under which these ships sail. They threaten the movement of food, fuel, humanitarian assistance, and other essential commodities to destinations and populations all over the world. And as can see in very real terms, the attack poses a serious threat to the marine environment in the region as the "Rubymar" was laden with 22,000 metric tons of Ammonium Phosphate – sulphate utilized as fertilizer.
Attempts to salvage the ship immediately after the incident were met with threats by Houthis to attack any salvors. This threat was made real when a fisherman who was in close proximity to the ship was killed after being mistaken for a salvor. This nonconfirmed second missile attack hit the cargo hold No.4 leading to the almost full sinking of the "Rubymar" and a possibility of a serious environmental disaster in the Red Sea; the effects of which have yet to be quantified. It also poses a subsurface impact risk to other ships transiting in the area as the bow of the ship is still up, while the stern is rested on the seabed. As of today, the situation remains bleak as attempts by the owner of the ship to salvage the ship have so far been unsuccessful.
As we work towards finding solutions in conjunction with local authorities of Yemen and the owner to combat pollution and preserve our oceans as well as to avoid a major environmental disaster, we must also address the issue of maritime security. Attacks on ships not only endanger the lives of seafarers but also have the potential to cause irreparable harm to our marine ecosystems.
Belize urges all member states and stakeholders today to prioritize maritime security and work together to ensure the safety of ships and seafarers at sea. We must stand united in condemning such acts of violence and hold those responsible accountable for their actions.
Let us not forget that the protection of our oceans and marine life is a collective responsibility that requires unwavering commitment and cooperation. Together, we can make a difference and create a more sustainable future for our planet.
The Belize government joins with the international community in condemning these attacks and call on the Houthis to cease these reckless attacks on merchant and commercial vessels in one of the world's vital waterways.
In closing, we of course must pause to remember the three seafarers who perished in a similar reckless attack by the Houthis on the Barbados flagged vessel "True Confidence". Mr. Chairman, with your consent, I ask that that Committee observe a moment of silence in their honour. The Belize government and the Belizean people, extend sincere condolences to the families of those seafarers. My Government requests that the Committee append this statement to the final report. Thank you."

Statement by the delegation of Belize

"Thank you, Mr. Chair, for allowing my delegation to come back to address this important matter during this session.
On Monday, my delegation made a statement concerning the attack on the Rubymar by the Houthis, condemning these actions against merchant shipping, which has disrupted global trade as well as negatively impacting the work done by this Organization in respect of the GHG reduction from ships by having part of the worldwide fleet taking longer routes to avoid any escalation on the attack of merchant and commercial ships while crossing the Red Sea. This

negative humanitarian, security, economic, and regional impact is properly addressed in the UN Security Council resolution 2722.
We take the floor again, Mr. Chairman, to update this Committee on the situation with new information brought to the Administration's attention in the last few days. We underscore though, Mr. Chairman that the overall situation with respect to the Rubymar remains the same. The issue that now confront us and which we now bring to the attention of the Committee relates to the seeming efforts by the UK based insurance company to avoid its responsibilities with a proper application of the insurance coverage for the wreck removal and the pollution. What we know, Mr. Chairman, is that the insurance company/insurers issued a Notice of Cancellation / alteration of Scope of War Risk insurance to the owners of the Rubymar on the 13th of February 2024, only 5 days before the incident; however, the Notice contained a grace period of 7 days with effective cancellation date from Noon GMT Tuesday 20th February 2024. Therefore, the vessel owner has been advised that the Rubymar was properly covered under the insurance policy on the date of the incident. We underscore, Mr. Chairman, that the Flag Administration is satisfied, to date, that the owners of the Rubymar are taking appropriate steps and efforts to address this matter.
We highlight this matter because, in our view, this action by the insurance company is inconsistent with aim of insurance coverage for a ship. Additionally, we are raising this matter because it is important to mention that the salvage operation is also delayed due to this cancellation of insurance coverage, with the attendant effects.
It is important to raise this matter to ensure that ships transiting this region are properly covered and if they are like the Rubymar, have all necessary grounds to press insurance underwriters to fulfill their obligations in the event a similar occurring.
With this being said, my Government extends its support to the request made by the Yemeni delegation on Monday for international assistance for the removal of the Rubymar from the Red Sea seabed, to mitigate the humanitarian and environmental impacts, extract all the remaining cargo from the ship, as well as to restore the safe navigation by ships transiting the Red Sea. This international support and technical assistance are also reflected in the earlier mentioned UNSCR 2722 .
The Belize Government is committed to this case as an affected State, demonstrated by our continuous communication with the Yemen authorities and the owners with the aim to identify and agree the best possible solution to minimize the humanitarian and environmental impact to the region.
We are in challenging times, and it is imperative that we stand united to ensure the safety and security of our seafarers as well as the protection of our environment.
Thank you, Mr. Chairman."

Statement by the delegation of Canada

"Thank you Chair, and we thank the Secretary General for raising this important issue and for his efforts on this matter. We want to start by expressing our sincere condolences to the families and delegations of the innocent seafarers who have lost their lives in the attack on the True Confidence.
Canada joins others in expressing our grave concern with the situation in the Red Sea and condemns the illegal and unjustifiable attacks by Houthi militants against commercial vessels transiting this area. These attacks pose a direct threat to the freedom of navigation in one of the world's most critical waterways, and are causing major disruptions to regional and global trade, impeding the movement of critical food, fuel, humanitarian assistance and other essential goods throughout the world. Importantly, these attacks are also jeopardizing the lives and safety of seafarers, and are directly threatening and destroying the marine environment, as we have seen with the sinking of the Rubymar.
These attacks are unacceptable and are in direct violation of the IMO conventions and the principles of this organization. Canada aligns with the intervention of the US, UK, Bahamas, Australia, Belgium and others and calls on the Houthis to cease these attacks immediately,

and to release all hostages. We also call on Iran, as a Member of this organization, to stop providing support to the Houthis, which enables these very attacks.
These destabilizing actions must end, for the safety of our seafarers, the freedom of navigation, and the protection of the marine environment.
We ask that our statement be included in the report."

Statement by the delegation of France

"La France remercie le Secrétaire Général pour ses efforts au service du monde maritime et au nom de notre Organisation.
Elle s'associe à la déclaration de la Belgique, prononcée au nom des Etats-membres de l'UE, et aux autres délégations, pour exprimer sa sympathie à tous les pays et personnes touchés par les attaques criminelles des Houthis, qui ont causé des morts et des dégâts inacceptables, contraires au droit international et aux Conventions de l'OMI.
La France présente en particulier à nouveau ses sincères condoléances aux familles des victimes philippines et vietnamienne de l'attaque meurtrière du vraquier '**True Confidence'**.
Elle exprime toute sa chaleureuse solidarité au gouvernement du Bangladesh suite à la prise en otage du **MV Abdullah** par des pirates somaliens et demande la libération des 23 membres de son équipage et du navire sans délai.
Nous demandons également à nouveau la libération immédiate et inconditionnelle du **Galaxy Leader** et des 25 membres de son équipage.
La France appelle à nouveau toutes les parties à respecter les résolutions de Conseil de Sécurité des Nations-Unies, à ne pas livrer d'armes aux houthis pour éviter l'escalade et à faire pression pour que ces attaques inacceptables contre la sécurité des marins, l'environnement marin et qui constituent une menace contre la paix et la sécurité de la région cessent immédiatement.
La France continuera d'œuvrer avec ses partenaires et participera à cet effet à l'opération ASPIDES de l'UE, au profit de la liberté de navigation de tous, er remercie les Etats qui contribuent aux efforts de sécurité, en particulier l'Inde récemment.
Nous demandons que cette déclaration soit jointe au rapport de ce sous-comité.
Merci Monsieur le Président."

Statement by the delegation of Germany

"Thank you Mr. Chair
Firstly, my delegation echoes the condolences expressed to the Delegations of Bangladesh, the Philippines and Vietnam; our thoughts are with the people and families immediately affected.
Germany vehemently condemns the violent and unjustifiable attacks by the Houthis on commercial shipping. The recent attacks on the vessels Rubymar and True Confidence show the horrific consequences. Endangering seafarers and holding them hostage – as is the case of the Galaxy Leader – is inacceptable.
These attacks are contrary to international law and interfere with the security of international shipping. They pose a serious threat to the fundamental principle of freedom of navigation and have also negative impact on the environment. But first and foremost, they endanger the lives of innocent seafarers, as drastically shown by the latest incidents.
The same applies to piracy incidents as in the recent case of the MV Abdullah. It is imperative that this organisation stands united in denouncing these crimes and demands the unconditional release of seafarers held hostage.
We thank the Secretary General for all his effort already taken. And we thank all member states and organisations who took action to secure the region at hand, which includes the mission ASPIDES that Germany is also part of.
We fully support the statement given by Belgium, Bangladesh and others.
Mr Chair, please reflect our statement in the committee's report.

Thank you Mr. Chair."

Statement by the delegation of Greece

"Thank you Chair and good morning to all distinguished delegates.
Greece would like to express its appreciation to the Secretary General for his continuous effort keeping the Member States update about Rea Sea area. This delegation would like to express its sincere condolences to Fillipinnes and Vietnam and warm solidarity with the government of Bangladesh.
Greece echoes the intervention made by Belgium, Italy Netherlands and others and is much concerned about maritime security in the Red Sea and Gulf of Eden after attacks by Houthi military forces against commercial vessels, including the seizure of ships and several attempts against commercial ships using drones and missiles.
Greece is a member of the European Union Naval Force "ASPIDES" and supports its goal, within its defensive mandate, to provide maritime situational awareness to accompany vessels, and protect them against possible multi-domain attacks at sea. Having its headquarter in Larissa, a large city in Thessaly region, Greece remains in alert regarding the development of its actions and priorities and monitors closely all the plans and actions taken in order to restore and safeguard freedom of navigation in the region.
Protection of human life and health at sea must remain a top priority.
We kindly ask our statement to be impended to the report of the Committee.
Thank you Chair."

Statement by the delegation of India

"Thank you Chair,
Good morning to all delegates.
We thank the Secretary General for his comment on the role of Indian Navy on the situation existing in the Red Sea.
The recent action by Indian Navy was indeed a triumphant moment for **#INSKolkata** and the Indian Navy as they ensured the surrender of 35 pirates and rescued 17 crew members without any harm on 16th March 2024. With support from **#INSSubhadra**, aerial units, and **#MARCOS** commandos, the operation also involved securing the vessel against illegal materials, showcasing the forces' readiness and coordination.
Demonstrating strategic excellence 2600km from our coast, this operation highlighted India's commitment to maritime security, safety and welfare of seafarers and safety of trade and sea lanes and is committed to working with others on same and look forward to consolidated action against such threats.
India shares the deep concern at the recent spate of activities against merchant vessels in the Red Sea and looks forward to an early concentrated effort against the same."

Statement by the delegation of Israel

"Israel wishes to adhere to the US statement and strongly condemns the Houthi attacks supported by Iran, and calls for significant action by the international community to enable the freedom of navigation and safety of seafarers."

Statement by the delegation of Japan

"Japan cannot tolerate any actions that impede the free and safe navigation of vessels, including the "seizure" of a Galaxy Leader, by the Houthis, and we firmly condemn such actions.
We support the intervention by the Bahamas and the others. Japan strongly calls for early release of Galaxy Leader and its crews. Besides, Japan shares deep concerns on the attack

by the Houthis to Rubymar, which causes serious environmental impacts in addition to the threat to safety of shipping.
In addition, regarding the attack on the cargo ship "True Confidence" by the Houthis and the casualties of the crew, Japan expresses our heartfelt condolences to the families of the innocent crews, and pray for the speedy recovery of the injured.
The Houthis has been attacking the Red Sea and other areas around the Arabian Peninsula since November last year, including the recent attacks. We firmly condemn the continued attacks on ships navigating the sea.
We recall that the UN Security Council adopted the resolution 2722 on January 10, which condemns the Houthis' attacks on vessels in the Red Sea and demands that the Houthis immediately cease all such attacks and immediately release the Galaxy Leader and its crew.
In this regard, Japan strongly urges all parties to act in a good faith in accordance with the UNSC resolution. Thank you."

Statement by the delegation of the Kingdom of the Netherlands

"Thank your Chair, and a very good day to all delegates being here today as well as the delegates following the meeting remotely.
This delegation would like to support the intervention made by Belgium on behalf of the EU member states, and the interventions made by others.
We strongly condemn the Houthis attacks on commercial ships, which are unacceptable violations of international law and the IMO Convention, and present a threat to the lives of our seafarers whilst disrupting global trade and freedom of navigation in the area. We call for the immediate and unconditional release of the Galaxy Leader and its 25 crew members. Our thoughts are also with the families of the victims following recent attacks on commercial ships. We specifically extend our deepest condolences to the families of victims after the murderous attack on the bulk carrier 'True Confidence'. We furthermore extend our deepest condolences to the delegations of Vietnam and The Philippines whose seafarers lost their lives in the attack.
It is of utmost importance that our seafarers, who make sure that international maritime trade is carried out every day and all over the world, are able to work in a safe and secure manner.
The Kingdom of the Netherlands hereby echoes earlier interventions and urges restraint by the Houthis to avoid further escalation in the Red Sea and the broader region.
We request this statement be added to the report.
Thank you chair."

Statement by the delegation of Philippines

"Thank you Chair and good day to all.
We sincerely thank the Secretary-General for his steadfast and unwavering support to all seafarers. We thank him for his earlier statement and for his call for the release of the crew of MV Galaxy which we echo.
The Philippines is saddened about the tragic loss of lives of seafarers – two Filipinos and one Vietnamese - and the injuries caused to the crew of *MV True Confidence* following an attack on the civilian cargo ship in the southwest of Yemen last March 6, 2024. We extend our deepest sympathies to their families and friends.
The growing number of attacks on merchant vessels manned by innocent civilian seafarers in the Red Sea is deeply concerning. We thank the Indian Navy and others who have provided assistance to the affected seafarers of *MV True Confidence*. We hope that more can be done to ensure the protection of seafarers and safety of navigation in the area."

Statement by the delegation of Poland

"Poland fully supports Belgium's intervention and expresses solidarity with the Government of Bangladesh in the aftermath of the MV Abdullah seizure by Somali pirates. We urgently call for the immediate release of the crew and the ship.
Additionally, we join in condemning the Houthis' attacks on commercial ships, underlining the threat to maritime security and peace. We also echo the call for the Galaxy Leader and its crew members' prompt release. Furthermore, we express our full solidarity with the Barbados authorities and the Philippine and Vietnamese governments, whose sailors lost their lives. Our heartfelt condolences go out to the families impacted by these tragedies, and we emphasize the imperative need to halt such attacks, which jeopardize lives and disrupt global trade.
Moreover, we share concerns about environmental risks from maritime incidents and stress the necessity for collaborative action to protect marine ecosystems."

Statement by the delegation of Romania

"Thank you chair, and good day to all,
Romania delegation strongly condemns the attacks carried out by the Houthis against commercial ships, which constitute unacceptable violations of international law and the IMO Convention and pose a threat to maritime security and peace in the area.
Also, we agree all positions expressed by distinguish delegates of IMO member states.
We express our hope that the Houthis will stop this escalation of violence in the Red Sea area and the maritime activity will become safe again in the region.
We would like to express our solidarity with the Governments whose seafarers are involved and we extend our sincere condolences to the families of the victims.
We request that this statement be attached to the report of this committee.
Thank you."

Statement by the delegation of Saudi Arabia

تحية طيبة الوفود الموقرين

نشكر السيد الأمين العام على جهوده وما ذكر في المقدمة على أهمية سلامة الملاحة البحرية في البحر الأحمر، كما يتقدم وفد المملكة العربية السعودية بأحر التعازي على وفاة البحارة من الفلبين وفيتنام وأهمية الإفراج عن السفن المحجوزة والحفاظ على سلامة البحارة.
نؤكد على قلق المملكة إزاء الأمن الإقليمي وحرية الملاحة في البحر الأحمر والتأكيد على أن الأولوية حاليا لخفض التصعيد في الممر المائي والمنطقة بأكملها، وناكد على حرص المملكة على التنسيق والتعاون مع الدول الشقيقة والصديقة لمواجعه كافة التحديات والمخاطر التي تحيط بالمنطقة وخصوصا منطقة البحر الأحمر وخليج عد، وسعي المملكة لحث الدول الشقيقة والصديقة والمنظمات الدولية ذات الصلة لبذل جهود أكبر لحماية امن وسلامة هذه الممرات.
ونحث على أن يتم بشكل عاجل مساعدة الدول الأعضاء وغير الأعضاء التي تسعى الى تطوير تدابيرها الوطنية الإقليمية الخاصة بها للتصدي لخطر القرصنة والسطو المسلح ضد السفن وغيرها من الأنشطة البحرية غير المشروعة، كذلك نحث المنظمة على التواصل مع المنظمات الدولية الحكومية وغير الحكومية لتنشط المناقشات حول تبعات استمرار الوضع الراهن في البحر الأحمر وتقديم مشورة الخبراء الى الدول الأعضاء في المنظمة البحرية الدولية بشأن مجالات عمل كل منها.
كما تحرص المملكة على تحقيق المصلحة الأمنية والسياسية والاستثمارية، وتأمين حركة الملاحة البحرية في هذا الممر المائي الدولي الاستراتيجي، حيث يعتبر شرياناً حيويا لانسياب التجارة العالمية التي يمر عبرها 12% من التجارة العالمية، ولا يخفى ان امن البحر الأحمر يؤثر على اقتصادات وامن الدول الإقليمية والعالمية وان عدم استقرارها يؤثر سلبا على المنظومة الدولية.
وتقدر المملكة جهود المنظمة في الحفاظ على امن الملاحة البحرية - ومنها اعتماد تحديث جدة 2017 على قواعد التعامل (DCoC) بشأن قمع القرصنة والسطو المسلح في غرب المحيط الهندي و خليج عدن – وما تلى ذلك من بيانات المنظمة الداعية الى وقف الهجمات التي استهدفت سفن الشحن الدولي وتأثيرها على حرية الملاحة و خطوط التجارة العالمية، وكما تدعم المملكة تلك الجهود فإنها تامل ان يطلع المجتمع الدولي على خطورة استمرار تهديد اكثر من 30% من الملاحة الدولية و التي تستخدم البحر الأحمر كممر رئيسي على بيئة البحر و سلامة مياهه و انسيابية و سلامة صناعة الشحن البحري، و إمكانية استحداث طرق نقل ضارة للبيئة – على سبيل المثال النقل البري و الجوي و النقل البحري غير المقنن – و الجنوح اليها بشكل تصاعدي للالتفاف على الأنظمة الدولية وتخفيض تكاليف النقل والشحن من قبل بعض المتضررين من استمرار الوضع الراهن في البحر الأحمر. وقد رصدت المملكة زيادة بنسبة 58% الى 129% في طول الوقت الذي تستغرقه عادة ناقلات النفط للسفر عبر الطرق الرئيسية في العالم وتأثير ذلك على

زيادة الانبعاثات الكربونية الضارة واختلال توازن البيئة البحرية والجوية.

Statement by the delegation of Spain

"España se suma a las muestras de condena contra los ataques huties a buques mercantes en el mar Rojo manifestadas por la delegación de Bélgica. En particular, España se une al llamamiento en favor de la liberación inmediata del buque Galaxy Leader, al mismo tiempo que mostramos nuestra solidaridad con aquellos que se han visto afectado por los ataques con especial mención a los sufridos por los buques True Confidence con pérdida de vidas entre su tripulación y Rubymar que provocó su hundimiento.
España agradece el compromiso del secretario general con la protección de la gente de mar, así como la información que viene facilitando el secretario general en relación con la situación en el Mar Rojo.
Esta delegación se suma se suma a las manifestaciones que el secretario general viene reiterando en las últimas reuniones de la OMI en favor del papel clave y de los derechos de la gente de mar, de la sólida defensa del derecho a la libertad de navegación, así como de la llamada de cautela y moderación para a evitar una escalada de la situación en el Mar Rojo.
Por último, manifestamos nuestra profunda preocupación por el secuestro por piratas somalíes del buque Abdullah de bandera de Bangladesh, así como nuestro apoyo al gobierno de Bangladesh y demandamos la liberación inmediata de sus 23 tripulantes.
Solicitamos adjuntar está declaración como anexo al informe final del comité."

Statement by the delegation of Ukraine

"Mr. Chair,
This delegation thanks the IMO Secretary-General for keeping us updated about the developments in the Red Sea and the pertinent threat to international shipping posed by the Houthis terrorist group.
We express our sympathies to the delegations of the Philippines, Vietnam with regard to the recent tragic casualties.
Ukraine joins the delegations of the Bahamas, Japan, Belgium and others in resolutely condemning the attacks by the Houthis against the commercial vessels using one of the most important trade routes that put rights and freedoms of international navigation under threat.
given the recent announcements by the leaders of this terrorist group about the planned increase in the attacks and widening of their geographical scope, there are no hopes for the de-escalation of the situation, especially with the spreading words about the monetization by the Houthis of the "safe passage" of ships.
The continued attacks by the Houthis also served as the impetus for the Somalia pirates to come back to the arena.
In view of the above, the international community needs to use all available resources to restore stability in the region by curbing the Houthis and their Iranian sponsors' malevolent activities.
There could be no other option for the Houthis rather than immediately stop the attacks and release the hostages from the mv Galaxy Leader.
I thank you, Mr. Chair, and kindly request that this statement is reflected in the Committee's report."

Statement by the delegation of the United Republic of Tanzania (on behalf of the signatories of the Djibouti Code of Conduct)

"The Signatory States to the Code of Conduct concerning the Repression of Piracy and Armed Robbery against ships in the Western Indian Ocean and the Gulf of Aden, also known as the Djibouti Code of Conduct (DCoC), and the Jeddah Amendment to the Djibouti Code of Conduct, 2017 (DCoC/JA), express profound concern and frustration regarding the escalation

of the security situation in the Red Sea area, which has further been compounded by the resurgence of piracy and armed robbery in the western Indian Ocean.
We are additionally troubled by the situation involving MV Abdullah, a Bangladesh-flagged bulk carrier recently hijacked by pirates off the coast of Somalia, resulting in the abduction of its 23-member crew. This and other recent attacks have prompted concerns regarding the resurgence of the piracy threat originating from Somalia, a matter that some industry stakeholders have been hesitant to acknowledge.
It is vital to note that the DCoC supports all efforts by member states in addressing the repercussions of the Red Sea crisis, with a particular focus on supporting the Government of Yemen. The Government of Yemen has consistently sought assistance from the international community to address pressing threats, including the urgent need to prevent the sinking of the UK-owned cargo ship, Rubymar, in the Red Sea on March 2, 2024. Furthermore, we mourn the tragic loss of three crew members and the injury of four others in a missile attack on the MV True Confidence on March 6, 2024, southwest of Aden, Yemen.
While we appreciate the action taken by international naval forces to protect merchant shipping, we stress the need to step up efforts. We therefore reiterate our previous call for increased naval presence and urge regional States with significant naval capability to contribute assets to support operations aimed at safeguarding the lives of seafarers and the protection of the marine environment. India's significant contribution serves as a commendable example.
We commend the tireless efforts of Mr. Arsenio Dominguez, Secretary-General of the International Maritime Organization (IMO), in rallying international support and mobilizing resources for the DCoC's 8-point action plan. We further commend the SG for his consistent advocacy for the safety and well-being of seafarers navigating the perilous waters of the Red Sea.
In pursuit of long-term solutions, the DCoC welcomes and supports the efforts of the Kingdom of Saudi Arabia in establishing a Red Sea Council. We stand ready to support these endeavors and collaborate in achieving our shared objectives.
The urgent need to support the recognized Government of Yemen and the Somali Government in building the capabilities of their Coast Guard and operationalizing the Regional Maritime Information Sharing Centre (ReMISC) in Aden cannot be overstated. Once operational, ReMISC will play a key role in contributing to information sharing as an integral part of the DCoC information network, necessary to support international efforts to combat illegal activities at sea.
In conclusion, the Signatory States of the DCoC reiterate their commitment to finding sustainable regional solutions for addressing the security challenges in the Red Sea region. We call upon the international community to join us in these efforts to ensure the safety and security of navigation and the protection of lives at sea."

Statement by the delegation of the United Kingdom

"Thank you, Chair.
The ongoing Houthi attacks in the Red Sea are illegal, unacceptable, and profoundly destabilising.
The attacks against merchant vessels threaten the safety of seafarers and navigation, and are strongly condemned by the UN Security Council and the Resolution 2722. The international community has taken extensive steps to address these unlawful maritime attacks via diplomatic means.
Despite these steps, the Houthis have continued to carry out their attacks, which have cost innocent seafarers lives, continue to put others at risk and impede the delivery of humanitarian aid. Threatening the stability of the coastal States of the Red Sea presents significant risks to wider international peace and security.

This has been highlighted by the tragic loss of lives and serious injuries to the crew during the attack on the commercial vessel MV True Confidence which occurred on 6 March. We offer our sincere condolences to the delegations of the Philippines and Vietnam.
These attacks are also having a profound effect on the marine environment, the attack on MV Rubymar on 18 February, resulting in its sinking on 2 March, have caused damage to the environment as well as a significant risk to navigational safety.
As others have stated we call for the Houthis to immediately and unconditionally release the MV Galaxy Leader and its crew.
There is no lawful justification for intentionally targeting civilian shipping and our seafarers. Securing the freedom of navigation serves as the bedrock of global trade in one of the world's most critical waterways.
The United Kingdom remains determined to hold those responsible accountable and remain strongly committed to the international rules-based order, defending the freedom of navigation and safe passage at sea.
We would also like to express our solidarity for the 23 Bangladeshi seafarers who are being held hostage on board the Bangladesh flagged vessel ABDULLAH in the territorial waters of Somalia.
Thank you, Chair."

Statement by the delegation of the United States

"Thank you Chair.

The United States thanks the Secretary-General for his continued focus on the dire impact of the Iran-backed Houthis' attacks on seafarers and commercial ships in the Red Sea and Gulf of Aden, and for keeping Member States apprised of the situation.
The United States is deeply saddened by the death of three innocent seafarers and injury of four others that occurred when the Houthis deliberately fired an anti-ship ballistic missile at the civilian commercial motor vessel (M/V) True Confidence on March 6. We offer our condolences to the delegations of the Philippines and Vietnam and to the families and friends of those innocent seafarers who lost their lives while simply doing their job.
We join other Member States in calling for the Houthis to immediately and unconditionally release the M/V Galaxy Leader and its 25 crew members whom the Houthi have held captive since they illegally seized the ship on November 19, 2023.
We recall UN Security Council Resolution 2722, which underscores broad support for the navigational rights and freedoms of vessels in the Red Sea, condemns these Houthi attacks, and demands that they cease.
We note again, as we have in other IMO meetings, that the Houthis' reckless attacks on commercial ships jeopardize the safety and welfare of seafarers whom this organization is charged to protect and threaten the marine environment and navigational safety.
These concerns were made more urgent following the Houthis' February 18 attack on M/V Rubymar. Here again, the Iran-backed Houthis deliberately targeted a civilian commercial ship with an anti-ship ballistic missile. The Rubymar's crew was forced to abandon ship, fortunately without casualties, but the ship slowly took on water and sank. It now poses a significant risk to navigational safety and has damaged the fragile marine environment in this vital waterway.
Iran has made no secret of its support to the Houthis. It is no secret that Iran provides weapons to the Houthis in violation of the UN arms embargo. Iran has provided the Houthis the training needed to use these weapons and carry out attacks like these. Iran also provides the Houthis extensive financial support. We know that without Iran's continued support, the Houthis would struggle to track and strike commercial vessels like the True Confidence, the Rubymar, and numerous others.
Every member of this organization – and especially those with direct channels to Iran –urgently press Tehran to cease providing these weapons and support to the Houthis before more innocent seafarers are killed by their reckless and abhorrent actions.

Likewise, every Member State of this organization should adhere to and uphold the arms embargo on the Houthis established under UN Security Council Resolution 2216 — an embargo that Iran has previously been found in non-compliance with by the Panel of Experts on Yemen mandated by Security Council resolution 2342
The United States remains committed to restoring stability in the Red Sea and Gulf of Aden, while protecting seafarers and commercial ships from Houthi attacks and upholding the fundamental principle of freedom of navigation.
We applaud the efforts of the Indian navy and others in this regard.
We also deplore the recent hijacking of the Bangladesh flagged vessel ABDULLAH and the 23 seafarers being held hostage by pirates off the Somali Coast, which is a flagrant violation of international law, and extend our condolences to the families of the seafarers and demand they be released as soon as possible.
Thank you, and we request that this statement be included in the final report of the Committee.
Thank you Chair."

Statement by the delegation of Yemen

السلام عليكم ورحمة الله وبركاته ومساء الخير بتوقيت عدن
في البداية أعرب عن شكري وتقديري لمعالي الأمين العام للمنظمة البحرية الدولية على جميع الجهود المبذولة لتطوير أداء صناعة النقل البحري العالمية وجهوده الخاصة في الوقوف مع اليمن في أزماته في جانب صناعة النقل البحري وجهوده الكبيرة لدعم اليمن لتنفذ التزاماتها تجاه تحقيق السلامة البحرية والحفاظ على البيئة البحرية والأمن البحري بالمنطقة و كذلك جهوده في دعم الدول الأعضاء DCOC/JAفي مدونة سلوك جيبوتي
كما نشكر جميع الدول التي ادانت الهجمات الحوثية على السفن.
وقبل أن نبدأ في كلمتنا فإننا نعرب عن أسفنا العميق للمتوفين في حادثة ترو كونفدينس ونعلن ادانتنا الكبيرة لهذه الحادثة ولجميع الحوادث البحرية الأخرى والتي تتسبب في إعاقة عمليات النقل البحري العالمية .
إننا في الجمهورية اليمنية ندين بكل لغات العالم الهجمات الاجرامية الحوثية على السفن و خطوط الملاحة كون ذلك يتعارض مع الاتفاقيات و القوانين الدولية و يعرض حياة البحارة المسالمين للتهديد و البيئة البحرية للضرر.
اليمن تأثرت بشكل سلبي كبير من الهجمات الغير شرعية التي تنفذها المليشيات الإرهابية الحوثية في البحر الأحمر وتسببت تلك الهجمات في الكثير من الحوادث الإنسانية إضافة لقلة نشاط النقل البحري باليمن وزيادة التأمين على السفن وغير ذلك وإننا قد أعلنا مرارا ومازلنا أننا نعمل كل طاقتنا لإيقاف تلك العمليات غير أن الطرف الآخر لا يستجب ونأمل من الجهود الدولية أن تنجح في الضغط لإيقاف هذه العمليات الغير شرعية.
اما بالنسبة لحادثة السفينة روبيمار التي غرقت في المياه اليمنية وهي محملة ب 22000 طن من السماد و كذلك 287 طن من الزيوت المختلفة التي سوف تؤدي لكارثة بيئية كبيرة جدا في مياه الجمهورية اليمنية ومياه الدول المجاورة في حال تسربت للبحر.
و برنامج المنسق المقيم للشئون الإنسانية IMOالحكومة اليمنية و الدول الصديقة و منظمات الأمم المتحدة كالمنظمة البحرية الدولية و برنامج الامم المتحد للبيئة و غيرها تبذل جهود كبيرة لاحتواء الازمة لتجنيب اليمن كارثة و شيكة ستؤثر على البيئة البحرية ocha بالمنطقة.
إننا في هذا الاجتماع نطلب من المنظمة البحرية الدولية والمنظمات الأخرى والدول الشقيقة و الصديقة مساعدة اليمن في رفع قدراتها لمواجهة حوادث التلوث البحري وغيرها كون الإمكانيات ضعيفة جدا ولا تستطيع الدولة بمفردها مواجهة حوادث التلوث البحري ونأمل إعطاء هذا الموضوع الاهتمام وعرضه على الدول الداعمة للوقوف معنا من أجل مكافحة أي تلوث بحري محتمل من السفينة روبيمار وغيرها.
كما نتمنى تنفيذ قرار مجلس الامن رقم 2722 لعام 2024 و خاصة البند رقم 5 و 6 اللذان يوصيان برفع قدرات اليمن و الدول الاخرى بالمنطقة لتعزيز الامن البحري بالمنطقة.
نرجوا ضم البيان الى التقرير النهائي للجنة

Statement by the observer from ICS

"Chair,
I am making this statement on behalf of BIMCO, CLIA, ICS, INTERCARGO, INTERTANKO, IPTA and WSC.
The global shipping industry welcomes the strong focus of the Secretary-General on this critical, and very disturbing, maritime security issue, both the continuing attacks on commercial shipping in the Red Sea and the Gulf of Aden, with the terrible loss of innocent seafarers' lives, and the serious disruption and *threat* this represents to the safe conduct of global trade; as

well as the totally unacceptable resumption of attacks, and hostage-taking of seafarers, by Somali pirates.
The global shipping industry greatly thanks the Indian navy for its recent decisive action, and the other navies providing military protection to shipping in the region.
The industry fully associates itself with those statements of condemnation and concern which have been expressed by a large number of Member States which have spoken this morning.
We look forward to a full discussion of these critical security issues at the next session of the Maritime Safety Committee.
Thank you."

ITEM 2

Statement by the delegation of Belgium (on behalf of the EU Member States)

"Merci monsieur le Président, bonjour à tous,
La Belgique, au nom des États membres de l'Union européenne, condamne avec la plus grande fermeté l'agression armée de la Russie contre l'Ukraine, qui a débuté en 2014 et a pris la forme d'une invasion totale de l'Ukraine le 24 février 2022, et qui constitue une violation de l'intégrité territoriale et de la souveraineté d'un État membre des Nations unies, s'étendant à ses eaux territoriales, et incompatible avec les principes et les buts de l'OMI, tels qu'ils sont énoncés à l'article 1er de la Convention de l'OMI.
Jusqu'à aujourd'hui, tous les organes clés de l'OMI ont condamné les actions illégales de la Russie contre l'Ukraine. En outre, l'Assemblée de l'OMI, lors de sa 33ème session, a également condamné l'agression de la Russie dans sa résolution A33/Res.1183.
La guerre d'agression menée par la Russie contre l'Ukraine continue de menacer la paix et la sécurité en Europe et dans le monde et a de graves conséquences mondiales sous la forme d'une insécurité alimentaire accrue et d'une hausse des prix de l'énergie.
Nous sommes consternés par la dégradation continue et délibérée de l'environnement dans la mer Noire, décrite en détail par notre collègue ukrainien, à la suite de l'agression de la Russie. Les conséquences environnementales de cette guerre perdureront pendant de nombreuses années.
La Russie, ses dirigeants politiques et toutes les personnes impliquées dans les violations du droit international et du droit humanitaire international en Ukraine doivent rendre des comptes.
L'Union Européenne et ses États membres ne reconnaîtront jamais les territoires temporairement sous contrôle militaire russe comme autre chose qu'une partie de l'Ukraine et continueront à soutenir les efforts de l'Ukraine pour restaurer son intégrité territoriale à l'intérieur de ses frontières internationalement reconnues aussi longtemps que nécessaire.
Nous demandons que cette déclaration soit jointe au rapport de ce sous-comité.
Merci monsieur le Président."

Statement by the delegation of Canada

"Canada reiterates its solidarity with Ukraine and continues to strongly condemn Russia's war of aggression against Ukraine. The war has crippled marine infrastructure, taken the lives of seafarers, caused significant damage to the marine environment and violated the fundamental principle of freedom of navigation for merchant vessels transiting in this region. These attacks constitute a clear violation of the UN Charter and the conventions and principles of this organization.
Canada wishes to align with the statements by UK, US and Belgium, asks all Member States to recall Assembly resolution A.1183(33), and calls for the complete and immediate withdrawal of all Russian forces from Ukraine's sovereign territory.
We ask that our statement be included in the report."

Statement by the delegation of France

"Merci Monsieur le Président,
Chers collègues,
La France s'associe à la déclaration prononcée par la Belgique, au nom des États membres de l'Union européenne, ainsi qu'aux interventions précédentes.
Nous condamnons à nouveau avec la plus grande fermeté l'agression armée de la Russie contre l'Ukraine, qui constitue une violation de la souveraineté et de l'intégrité territoriale, y compris de son espace maritime, d'un État membre des Nations unies, contraire à tous les principes du droit international et de l'OMI.
Nous rappelons que cette guerre a fait l'objet de condamnations de la part des organes de l'OMI, et en particulier par l'Assemblée lors de sa 33ème session, ainsi que de l'Assemblée générale des Nations-unies.
Ces actions menacent directement la sûreté et la préservation de la Mer Noire et les nouvelles attaques contre le port d'Odessa en particulier, sont une nouvelle preuve de la volonté de porter atteinte à la navigation, aux infrastructures maritimes et à la vie des marins, absolument inacceptables pour les membres de l'OMI.
Je vous remercie monsieur le Président et souhaite que cette déclaration soit jointe au rapport de ce comité."

Statement by the delegation of Germany

"Thank you Mr Chair.
Germany condemns in the strongest possible terms Russia's armed aggression against Ukraine and their unlawful invasion of Ukrainian sovereign territory, which includes their territorial waters.
Our support and solidarity for Ukraine, its people, their territorial integrity and independence remains unwaivered.
We demand that the Russian Federation withdraws its troops and military equipment from Ukraine's internationally recognized borders immediately and unconditionally.
Germany aligns itself with statement given by Belgium on behalf of the EU member states.
Please include our statement in the report of this committee.
Thank you Mr. Chair."

Statement by the delegation of Ireland

"Ireland wishes to align our-selves with the statement made by Belgium and others, and to also commend the IMO Secretary General and the Secretariat for their work in supporting the safety of shipping, seafarers' welfare, and the maritime environment in the Black Sea and Sea of Azov.
Ireland wishes to offer our sincere condolences to the people of Ukraine for the losses they have suffered and regrettably, continue to suffer.
Ireland has welcomed the decision of the European Council to grant Ukraine candidate status. This decision has provided a clear international signal to the people and Government of Ukraine, about their place in the European family.
The continuing Russian military action against Ukraine is illegal and immoral, involving the utterly unacceptable targeting of civilians and civilian infrastructure, with cruel and indiscriminate attacks continuing through-out the Country. In addition, the damage caused to Ports, the surrounding infrastructure and the maritime environment is massive in scale and will have long reaching consequences for the region.
It remains critical, that vital cargos including food, fuel and medicines are allowed to flow safely and unimpeded in-to Ukraine and that Ukrainian goods & food produce is allowed to be safely exported.

A full and comprehensive cessation of hostilities and the withdrawal of the Russian military from Ukrainian territory, including its territorial waters, is immediately required to ensure the safety and welfare of its civilians, and the protection of the Marine environment. Ireland is unwavering in our solidarity with the people of Ukraine and in our support for Ukraine's sovereignty, territorial integrity, and right of their citizens and of all people live in peace.
We would request that Irelands statement is included in the report of this Committee.
Thank you, Sir."

Statement by the delegation of Italy

"Italy aligns itself with the statement just made by the distinguished delegation of Belgium, on behalf of the EU Member States.
After more than two years since the territorial invasion of Ukraine, the Italian delegation, once again, condemns, in the strongest possible terms, the Russian Federation's unprovoked and unjustified military invasion of Ukraine, a sovereign state of Europe, whose people are unjustly paying for the atrocities of a deliberate military attack.
In addition to highlighting the huge environmental damage that the current aggression is creating in the Black Sea, we take this opportunity, as already stated by other distinguished delegations, that all key IMO bodies and the IMO Assembly, at its 33rd session, have condemned Russia's aggression.
Therefore, Mr. Chair, Italy, as well, demand that the Russian Federation immediately cease its military actions and fully respect the territorial integrity, sovereignty and independence of Ukraine within its internationally recognised borders.
We ask this statement to be attached to the final report of this committee."

Statement by the delegation of Japan

"Thank Ukraine and its statement just delivered.
Japan aligns with UK and others, and would like to reiterate our firm position on this matter.
Russia's aggression against Ukraine is an attempt of unilateral change of the status quo by force and an infringement of Ukraine's sovereignty and territorial integrity, which constitutes a clear violation of international law, and is a grave breach of the United Nations Charter. We further recall that this Organization adopted the Assembly Resolution A.1183(33), on 4 December 2023.
All actions that shake the very foundation of international order are absolutely unacceptable, and Japan condemns Russia's actions in the strongest terms.
Japan urges Russia to cease its ongoing aggression and to withdraw its troops and military equipment immediately, completely and unconditionally from the entire internationally recognized territory of Ukraine."

Statement by the delegation of Lithuania

Thank U Mr Chair, good afternoon to all,
Lithuania stands united with Ukraine and condemns in the strongest possible terms Russia's unprovoked and illegal war against Ukraine and its people. This delegation aligns itself and fully supports the statements made by Belgium and others. Mr. Chair, we kindly ask you to attach this statement to the final report of this committee. Thank you.

Statement by the delegation of Luxembourg

"Merci Monsieur le Président et bonjour à tous,
Pour être très bref, Monsieur le Président, la délégation du Luxembourg affirme toute sa solidarité vers le peuple de l'Ukraine et voudrait bien s'associer à la déclaration de la Belgique,

suivi par l'Irlande, la France, le Portugal, l'Allemagne aussi bien que d'autres délégations de l'Union Européenne.
Nous vous saurions gré de bien mentionner notre intervention dans le rapport final de la présente session de notre comité et nous ne manquerons pas de l'envoyer au Secrétariat.
Je vous remercie Monsieur le Président."

Statement by the delegation of Norway

"Thank you Chair,
Norway aligns with the statement of the United Kingdom, the United States, Belgium and others, and joins other IMO members in condemning Russia's attack on Ukraine in the strongest possible terms.
Russia's attack on Ukraine is an unprovoked and illegal attack on a peaceful neighbour. It is a clear and unacceptable violation of international law and a breach of the most fundamental rules of international relations and respect for the sovereignty and territorial integrity of UN member states.
Norway stands firmly with Ukraine for as long as it takes, and the people of Ukraine have our full support and solidarity.
Thank you."

Statement by the delegation of Spain

"España apoya en su totalidad la intervención de la delegación de Bélgica en nombre de la Unión Europea en la que se condena la agresión militar no provocada e injustificada de la Federación de Rusia contra Ucrania.
Nos gustaría aprovechar esta oportunidad para volver a expresar nuestro compromiso y solidaridad con el pueblo ucraniano ante la agresión de la que está siendo objeto por parte de la Federación de Rusia.
España comparte las mismas preocupaciones manifestadas por la delegación de Ucrania en relación con las consecuencias que sobre el medio marino tiene las acciones militares llevadas a cabo por la Federación Rusa en el Mar Negro y el Mar de Azov. En ese sentido, destacamos la importancia de la implementación de la Resolución de la Asamblea de la OMI A. 1183(33) y de la cooperación internacional para apoyar a Ucrania en el restablecimiento del equilibrio ecológico del Mar Negro y el Mar de Azov.
Solicitamos por último que esta declaración sea incluida en el informe final del Comité."

Statement by the delegation of Ukraine

"Mr. Chair,
While the international community's attention has been lately focused on the situation in the Red Sea, where the one terrorist group threatens civilian ships and crews with missile and drone attacks, one should not forget that this has long become a reality Ukraine is leaving for over two years.
In 2022, the world witnessed the targeting of civilian vessels and critical port infrastructure, disrupting global trade and causing direct harm to the marine environment. The relentless attacks on Ukrainian ports and commercial ships, both heading to or from our ports, or stranded there since the beginning of the invasion, have been one of its major hallmark.
As we reflect on the second anniversary of the unprovoked invasion of Ukraine, it is imperative to acknowledge the catastrophic toll exacted upon not only the Ukrainian people but also upon the delicate ecosystems of the region.
The heinous actions perpetrated by the Russian Federation in the Black Sea and the Sea of Azov stand as a grave testament to the depths of their disregard for human life, international law, and environmental sanctity.

Russia's ruthless military aggression has left a trail of destruction, with the marine environments of the Black Sea and the Sea of Azov enduring the most of their merciless onslaught. The marine ecosystem is directly impacted by military activities such as the manoeuvring of vessels, missile launches from naval assets, and the sinking of ships during hostilities. Additionally, the environment faces threats from the flooding of radioactive or chemically active ammunition, contamination from aircraft and missile wreckage. Other detrimental effects include the mining of aquatic areas, underwater explosions, and the increased operation of ship sonars, particularly from submarines. These actions collectively pose significant risks to marine life and habitats. This is a stark reminder of the unseen casualties of war.

The reckless deployment of sea mines has not only endangered the lives of innocent civilians but has also plunged the ecological balance of the region into turmoil. In light of these challenges, we commend the recent agreement between Bulgaria, Romania, and Turkey to combat drifting sea mines and express Ukraine's readiness to join practical efforts with Black Sea states to overcome the negative consequences of Russia's illegal actions.

Mr. Chair,

The consequences of Russia's actions extend far beyond the immediate devastation wrought upon Ukraine. The widespread pollution stemming from the destruction of on-shore industrial sites, and the deliberate release of toxic substances into the sea pose a grave threat to the entire Black Sea basin and beyond. The ecological fallout resulting from these atrocities is immeasurable, with marine life bearing the brunt of the ecological catastrophe.

For instance, the destruction of vital infrastructure such as the Kakhovskaya HPP dam on June 6, 2023, serves as a stark reminder of the far-reaching consequences of Russia's belligerence. The wanton disregard for international treaties and conventions aimed at protecting the marine environment underscores the egregious nature of Russia's actions and demands swift and decisive condemnation from the international community.

Furthermore, the deliberate introduction of foreign invasive species into Ukrainian territorial waters further compounds the environmental crisis, threatening the delicate balance of marine ecosystems for generations to come. The cumulative impact of Russia's aggression on the Black Sea and the Sea of Azov cannot be overstated, with estimated damages amounting to billions of dollars and irreparable harm inflicted upon the environment.

Thus, having followed the development of the Russian invasion over these two years, all IMOI Member States has a clear picture of the brutal violations by Russia of its international obligations under many IMO instruments. Apart of the IMO Convention it includes such basic treaties as MARPOL, SOLAS, OPRC and its Protocol, CLC, as well as BWM 2004.

Mr. Chair,

In light of these egregious crimes, it is incumbent upon the international community to unequivocally condemn Russia's actions and demand the immediate cessation of hostilities. The protection of the marine environment must be upheld as a paramount priority, even in times of conflict, in accordance with the principles of international humanitarian law.

It is also paramount to strictly implement relevant provisions of IMO Resolution A. 1183(33) on the impact of the Russian military invasion of Ukraine on international shipping. Ukraine stands ready to collaborate with Black Sea countries to mitigate the environmental fallout of Russia's illegal actions and reaffirms its commitment to upholding international obligations aimed at safeguarding the marine environment. It is only through concerted international cooperation and unwavering condemnation of Russia's aggression that we can hope to restore the ecological balance of the Black Sea and the Sea of Azov for the sake of current and future generations.

I thank you, Mr. Chair, and kindly request that this statement is reflected in the Final report."

Statement by the delegation of Ukraine

"Mr. Chair,
In response to the comments made by Russia just now this delegation would like to underscore that the essence of Russia's speech lies in another demonstration of manipulative actions, typical and usual for that delegation over the years. |In this regard, hearing again throw-in of the term "politization", we could only recommend to study carefully the provisions of Resolution A.1183(33), adopted by our Organisation.
In addition to our statement made earlier today, we wish to inform that in 2022 the International Law Commission adopted "Draft Principles on Protection of the Environment in Relation to Armed Conflicts", which prohibited the use of methods and means of warfare that are intended to cause widespread, long-term and severe damage to the environment. It stated definitively that the law of armed conflict, including principles and rules of distinction and precautions shall be applied to the environment, with a view to its protection.
The delegation of Ukraine would also like to note that only during last year there have been more than 4000 reports on Russia's illegal military actions with a direct environmental effect.
Ukraine together with international environmental agencies, including United Nations Environment Programme (UNEP), as well as nongovernmental organizations have been documenting the environmental damage caused by aggressor state, with the goal of seeking reparation and restoration of both the natural and the built environment during the postwar reconstruction period.
I thank you, Mr. Chair, and kindly request that this statement is reflected in the Final report."

Statement by the delegation of Ukraine

"Mr. Chair,
Before we proceed with the consideration of the Final Report, this delegation wishes to make a general statement.
On the night of 22 March, the terrorist Moscow regime ordered the attack with at least 8 aero-ballistic and cruise missiles at the Dnipro Hydroelectric Power Plant in the Zaporizhzhia region, which is the largest in Ukraine.
If successful, this attack could have caused another ecological catastrophe doubling the aftermath of destruction of Kakhovka HPP dam by Russians in 2023, thus inflicting far-reaching consequences to the regional environment, the inland and international shipping and marine ecology.
Yet, as of now, the State Ecological Inspection has already recorded a massive leakage of oil products into the river. And the situation at the dam remains critical, but manageable.
The attack on the Dnipro HPP is a consequence of the international community's weak reaction to the destruction of the Kakhovka dam. This shelling was a just part of the large-scale attack by Russian terrorists that launched 151 weapons (loitering munitions and missiles) at dozens of energy system facilities and residential areas in six different regions of Ukraine.
Apart from spreading the fear the purpose of the shelling was to cause a large-scale malfunction of the energy system of Ukraine. The safety of the temporarily occupied Zaporizhzhia NPP was once again put at risk, as the attack damaged its external power supply line.
Another clear reminder for those Member States who may still say that everything is not so obvious and needs further investigation into the situation regarding who is the real perpetrator of these international crimes. And it once again shows that the Kremlin regime has no limits.
The only conclusion is - Russia must be stopped before it exports havoc further into Europe and causes global environmental disasters, and all responsible must be brought to justice.
I thank you, Mr. Chair, and kindly request that this statement is appended to the Committee's report."

Statement by the delegation of the United Kingdom

"Thank you, Chair.
The United Kingdom continues to support the Ukrainian government in its defence against Russia's unprovoked, premeditated, and barbaric attack. We stand united with our international partners against the actions of the Russian government which are an egregious violation of international law and the UN Charter.
Freedom of navigation for commercial shipping in the Black Sea must be upheld. Russia's attempts to stifle the economy of Ukraine by disrupting the Black Sea Grain Initiative are cynical and cowardly. With world now further away from its goals to eliminate world hunger and malnutrition, Ukraine's exports through the Black Sea ports are crucial to global food security.
As the war enters third year, we stand united to ensure Ukraine emerges from the war as a strong, sovereign, and free country.
The United Kingdom will continue to denounce and condemn the illegal war of aggression waged by Russia against Ukraine in flagrant violation of international law and to call for the complete, immediate and unconditional withdrawal of Russian armed forces from all Ukrainian territory.
Thank you, Chair."

Statement by the delegation of the United States

"The United States condemns in the strongest possible terms the Russian Federation's unprovoked and illegal war against Ukraine. The Russian Federation's war on Ukraine is a flagrant violation of the sovereignty and territorial integrity of Ukraine as well as the United Nations Charter, and is inconsistent with the purposes of the IMO as set out in Article 1 of the IMO Convention.
We recall the decision of the 33rd Assembly of the IMO to adopt resolution A.1183(33) on the impact of Russia's armed invasion of Ukraine on international shipping and call for implementation of its relevant provisions.
As the distinguished delegation of Ukraine made clear, the damage to the marine environment and the environment more broadly resulting from Russia's unjust war is severe.
We continue to stan with Ukraine and demand that the Russian Federation cease its unlawful invasion and withdraw all its forces from Ukrainian territory, including its territorial waters. We also demand that Russia cease its threats to the safety and welfare of seafarers, the security of international shipping, and the marine environment.
Thank you, Chair."

ITEM 5

Statement by the observer from IACS

"The proposals outlined in the document MEPC 81/5/6 align well with the objectives and values of IACS Members acting as recognized organizations (ROs). In principle, IACS is in agreement with the proposed course of action and offers support towards its realization.
Regarding comments in paragraph 17 of document MEPC 81/5/6, IACS considers it imperative to address the reported disparities in the implementation of regulations by various ROs, as mentioned therein. In order to assist flag States and ROs, IACS would invite the authors of this document to provide examples of specific cases where varying interpretations have been applied.
On a general note, IACS would emphasize that when accepting authorization from flag States, ROs – members of IACS – have unequivocally pledged to strictly adhere to the requirements in regulation 13 of MARPOL Annex VI and the NOx Technical Code. It is important to note that under legal provisions of agreements between flag States and ROs, ROs are not empowered

to exercise discretion in interpreting these mandatory instruments or granting exceptions to them. Such prerogatives are exclusively the reserve of flag States. That is the reason IACS brings unified interpretations to IMO, either for awareness of Member States or action by IMO. More specifically, during the introduction of new engine technologies, fuels or altered operating conditions of ships, situations may arise where certain aspects of existing regulations become not applicable or fail to adequately address the necessary approval and certification procedures. In such situations IACS members promptly identify and raise those issues directly to flag States and through IACS to IMO to ensure a unified approach among all ROs in handling such cases. This commitment is evidenced by our continuous efforts, including the ongoing revision of unified interpretations on emission matters and proactive proposals to amend IMO regulations and guidelines.
IACS recalls that ROs operate within the framework set by IMO and have to fully adhere to and uphold compliance with requirements of the RO Code adopted by resolution MSC.349(92); they undergo regular audits by flag States to confirm that compliance. IACS welcomes investigations which may be initiated by flag States being within that IMO framework of the III Code and the RO Code concerning application of the current regulations governing engine NOx emissions.
As regards investigations not relevant to the role of ROs, IACS suggests that the initial investigations focus on evaluating compliance of in-service engines in order to determine whether any potential loopholes exist, particularly following engine NOx pre-certification.
In our view such an approach could effectively facilitate the identification and resolution of any pertinent issues."

Statement by the observer from EUROMOT

" Thank you Chair and good day to all.
EUROMOT would like to thank Belgium et al for MEPC 81/5/3. We also thank Finland for their valuable comments in document MEPC 81/5/6, which we support in general.
MEPC 81/5/3 presents perceived shortcomings of the current NOx regulation. Our comments will focus on technical issues related to engines and NOx reduction systems. Regarding emissions at low load and the functioning of NOx reduction systems, we note the following:

- First, it is important to keep in mind that while specific NOx emissions in g/kWh will go towards infinity when the engine load goes towards zero, the absolute NOx emission in kg/nautical mile will not increase correspondingly.
- Second, EUROMOT is of the view that simply turning off the NOx reduction system just below 25% load would be considered as an irrational control strategy, thus prohibited by regulation 13.9 of MARPOL Annex VI.
- This understanding is confirmed by the amendments on rational emission control recently agreed by PPR 11.
- Third, we note that the decisive parameter for reduced operation of SCR systems below 25% is not engine load but exhaust temperature.

Further, EUROMOT acknowledges that different technical solutions could be applied to further reduce low-load NOx emissions for Tier III. We also acknowledge the concerns expressed regarding the representativeness of the existing test cycles and weighting factors.
We would, however, like to highlight that methods to reduce NOx emissions would typically require use of additional energy and/or fuels with lower Sulphur content.
In relation to test cycles, we note that the engine test cycles in the NOx Technical Code are based on ISO 8178 and aligned with ISO standards from other sectors.
EUROMOT is therefore of the firm view that a possible revision of the test cycles, if deemed necessary, should be developed by ISO. ISO's revision can then be adopted by the Organization by amending MARPOL Annex VI and the NOx Technical Code.
Regarding compliance procedures, we note that the current NOx technical code, as well as the SCR guidelines, already contain a number of tools to verify operation of Tier III technology. However, the tools for facilitating enforcement may be further explored.

Finally, regarding NOx emissions from alternative fuels, EUROMOT understands that all marine diesel engines will have to comply with the relevant limits of regulation 13 of MARPOL Annex VI.
Technologies to reduce NOx are well known to industry and can be applied equally to engines operating on alternative fuels.
Having said this, EUROMOT is open to explore the need to revisit the current NOx regulation. Should the Committee decide to change test cycles or strengthen the NOx regulation, this should be considered a new Tier.
As such, the industry should be given adequate time to adapt to the new regulation.
Thank you Chair."

ITEM 6

Statement by the observer from ICS

"Chair,
As a co-sponsor of paper 6/6, we fully support the proposed resolution.
We recall there was insufficient time for the CII correspondence group to complete the definition of correction factors and voyage adjustments, and these guidelines are therefore labelled "interim". As detailed in our submission 6/6 there have also been prior to this meeting 30 submissions identifying various system weaknesses and further submissions have been made to MEPC 81 highlighting system anomalies. Indeed, there are several aspects, e.g. port waiting time, voyage duration and adverse weather, which although outside of the control of a shipowner or crew, adversely impact the CII rating. Hence during the present system review, which extends to 1st January 2026 we believe that IMO's soft enforcement approach is correct. However, the feedback from our membership is indicating a growing trend for wider stakeholders to use the CII ratings, or the AER and CGDIST metrics for decisions of consequence. These include financiers, insurers, charterers and brokers. Unless corrected, we believe this is likely to have unintended consequences for our decarbonisation efforts, with well-designed and efficiently operated ships being unfairly penalised for factors outside of their control.
The objective of the resolution is to urge these stakeholders to be cautious in their use of the CII system during the review period, and in effect adopt a similar cautious approach to IMO. We look forward to contributing to the CII review and trust that a fair and robust system emerges from this process.
Thank you Chair."

Statement by the observer from CLIA

"Thank you, Chair, CLIA co-sponsored MEPC 81/6/6 to raise legitimate concerns with identified shortcomings of the CII system, and ratings, which may not accurately reflect cruise passenger ship emissions and efficiency.
We are concerned that decisions made by external stakeholders such as port and local authorities, port State control, financiers, and others will be detrimentally influenced by misrepresentative CII ratings.
We have heard concerns within the Committee that ships that must sail longer voyages will produce more carbon emissions. With the current CII metric, ship operators are similarly incentivized.
Under the existing CII metric, long port stays with short voyages may achieve poor CII ratings. By contrast, short port stays with long voyages may achieve better ratings, despite having more absolute emissions, and thereby defeating the overall objective of the Committee's work and giving rise to unintended, adverse consequences.

The CII Review Period is underway. Industry will comply while we also do our part to propose an alternative metric which more accurately represents the efficiency of cruise passenger ships and is better aligned with the IMO Strategy.
This, however, will not mitigate the negative impacts of misleading CII ratings in the near-term.
Shore power capability on ships is far outpacing shoreside capacity, and access to alternative fuels to improve CII ratings remains limited. Accordingly, there are few options available to improve ratings beyond reducing time spent in port or omitting port calls, but with higher absolute emissions expected with longer voyages with less port time.
Ship-owners need access to financing for alternative fuels and technologies NOW to meet industry ambitions consistent with the 2023 strategy. Now is not the time for financiers to limit access to funds based on misleading CII ratings. The proposed Resolution will raise awareness and reinforce among wider stakeholders that a review is under way and drawing conclusions from ratings during the review period should be avoided.
Ships must still comply with the regulations. The resolution reinforces the dedication of the Organization to date and recognizes that the review period is expected by all to result in improvements to the CII system.
We ask for the Committee to forward the Resolution to the Working Group with a view to further development for adoption by the Committee. We request that this statement be included with the Report of the Committee. Thank you. Chair".

ITEM 7

Statement by the Minister for Public Works, Transport and Meteorological Services of Fiji

"The Chairman of the Marine Environment Protection Committee at this 81st session;
The Secretary General of the International Maritime Organization;
Distinguished delegates representing the member states of the International Maritime Organisation (IMO) at this session;
Ladies and Gentlemen,
I extend Fiji's sincere congratulations to Secretary General, Mr. Arsenio Dominguez on his recent appointment as he took over the wheel from Mr. Kitak Lim as the Captain the International Maritime Organization steering its way to the foreseeable future.
With our unwavering support, we believe that your leadership will propel the International Maritime Organization towards commendable milestones, fostering cooperation and advancement on a global scale. Once again, we extend our best wishes for prosperity in this new role.
I would like to express my heartfelt appreciation to those agencies and member states that have facilitated the physical presence of our delegation and others from the Pacific region at this crucial meeting. My gratitude also to the Chairman) for this opportunity to address the 81st session of the Marine Environment Protection Committee (MEPC) this morning. It is with a sense of duty that I convey Fiji's perspective and our region's concerns regarding the pressing issues confronting us, particularly the imperative need to adapt and mitigate GHG emissions within the maritime industry.
The gravity of the climate crisis cannot be overstated. It is imperative for us to take resolute and decisive measures to alleviate its impacts. At this critical juncture in our collective history, we are confronted with formidable challenges posed by climate change.
The 2023 Revised IMO Strategy paves a coherent pathway, emphasizing the significance of both technical and economic measures in achieving our emissions reduction objectives. I commend the delegations of all member states for their unwavering commitment to this strategy and their acknowledgment of the necessity for immediate action.
Fiji, like several other member states, advocates for the implementation of a GHG pricing mechanism—a universal mandatory levy on well-to-wake GHG emissions levied fuel.

This measure aligns with the aims of the 2023 Strategy and provides a necessary incentive for transitioning towards cleaner and more sustainable shipping practices.
By ensuring equitable treatment for all stakeholders and prioritizing assistance for workers in economically disadvantaged and climate-vulnerable nations, we can ensure inclusivity in this pivotal transition.
It is essential to bridge the price differential between environmentally friendly and fossil fuels through an effective financial mechanism, thereby incentivizing the adoption of sustainable fuel alternatives.
Furthermore, a scientifically grounded well-to-wake approach must be pursued to engender genuine reductions in emissions. Failure to do so risks merely displacing emissions from one sector to another.
We must ensure that this transition to sustainability is equitable and supportive of all countries, especially developing countries particularly Small Island Developing States and LCDs. The just and equitable transition we are committed to entails significant real costs, which must be carefully considered in negotiations over revenue disbursement. As we strive towards operationalizing the infrastructure for disbursement by no later than 2027, it is paramount that key decisions on a framework for revenue disbursement be made expeditiously.
It is imperative that we collectively recognize the substantial challenges posed by climate change and the urgent need for action within the maritime industry.
I extend sincere gratitude to the International Maritime Organization (IMO) for providing a platform for constructive dialogue and action. The dedication and hard work of all delegates in addressing the pressing issues affecting our maritime industry are commendable. Let us unite in our commitment to implementing the IMO GHG Revised Strategy, recognizing its pivotal role in steering us towards a more sustainable future. Together, through collaboration and determination, we can overcome the challenges ahead and pave the way for a cleaner and more resilient maritime sector.
Finally, Fiji expresses its sympathy to all seafarers being held hostage and offers sincere condolences to those who have lost their lives or have been injured. We continue to pray for them and their families. Fiji calls for an Ocean of Peace and a peaceful resolution to all ongoing conflicts, aspiring for the triumph of the natural state of peace among peoples over war and conflict.
I thank you Chair."

Statement by the Executive Secretary of the United Nations Framework Convention on Climate Change (UNFCCC)

"Thank you, Mr. Chair.
Greetings to all, including those joining this meeting remotely.
I am glad to be here with you today. On behalf of the UNFCCC secretariat, I would like to share a summary of key outcomes of COP 28 in Dubai and our expectations for MEPC81. In the interest of time, a full version of the statement will be forwarded to the secretariat for inclusion in the report.

Key relevant outcomes of COP 28

SBSTA 59

I wish to start by reporting the outcomes of negotiations on the bunker fuel agenda item at SBSTA 59, held in the first week of COP 28. UNFCCC secretariat expresses gratitude to the IMO secretariat for its submission to SBSTA 59 and the statement delivered at the SBSTA 59 opening plenary. They informed UNFCCC Parties on recent progress and achievements in IMO's efforts to address greenhouse gas emissions from the international shipping sector. The historic adoption of the 2023 IMO greenhouse gas strategy, with enhanced targets and indicative checkpoints, was particularly highlighted.
Under this agenda item, the SBSTA organized a constructive dialogue between Parties and ICAO and IMO secretariats, fostering through an exchange of views and questions on the submissions from the two secretariats. Among the topics covered were how IMO's basket of

midterm measures will contribute to achieving the 2030 indicative checkpoint for greenhouse gas emissions and levels of ambitions for the uptake of zero or near-zero greenhouse gas emission technologies and fuels by 2030.

While a conclusion of this agenda item was not reached at the last session, Parties deepened their understanding of the significant progress and ways forward in emission reduction efforts in this crucial sector. This agenda item will be considered again at SBSTA 60 in June.

CMA 5

Moving on to CMA 5, distinguished delegates, there were a range of outcomes that can inform the Committee's work.

Most significantly, CMA 5 adopted a decision on the outcome of the first global stocktake, with the following key points:

- Firstly, it acknowledged the significant collective progress towards the long-term temperature goal of the Paris Agreement, reducing the expected global temperature increase from 4 °C above pre-industrial levels before the adoption of the Paris Agreement to the range of 2.1 to 2.8 °C with the implementation of the latest NDCs, IMO's 2023 greenhouse gas strategy and the resolutions of ICAO's forty-first Assembly;
- However, it recognized the urgent need to address the gap to the long-term temperature goal and emphasized that urgent action and support are needed to keep 1.5°C alive;
- In this context, it called on Parties, among others, to contribute to the global efforts towards deep, rapid and sustained emission reductions in line with 1.5 °C pathways, in a nationally determined manner, including:
    - Transitioning away from fossil fuels in energy systems, in a just, orderly and equitable manner, accelerating action in this critical decade, so as to achieve net zero by 2050 in keeping with the science;
    - Accelerating efforts globally towards net zero emission energy systems, utilizing zero- and low-carbon fuels well before or by around mid-century;
    - Tripling renewable energy capacity and doubling the average annual rate of energy efficiency improvements by 2030;
    - Accelerating zero- and low-emission technologies, including, inter alia, renewables, nuclear, abatement and removal technologies such as carbon capture and utilization and storage, particularly in hard-to-abate sectors, and low-carbon hydrogen production; and
    - Accelerating and substantially reducing non-carbon-dioxide emissions globally, including in particular methane emissions by 2030;
- The decision also encouraged Parties to communicate their next round of NDCs aligning with 1.5 °C pathways, with economy-wide emission reduction targets;
- Further, the decision encouraged Parties and non-Party stakeholders to enhance cooperation on the implementation of multilateral environmental conventions and agreements, to facilitate achievement of the long-term goal of the Paris Agreement and the SDGs.

While this agreement on the global stocktake is far from perfect, it would have been unthinkable just a few years ago. It sends a very strong signal on the pathways for global decarbonization. This decision will inform Parties in preparing and communicating their next round of NDCs and in enhancing their national efforts, support and international cooperation in relation to climate action.

The UNFCCC secretariat would like to express its appreciation to the IMO secretariat for its timely submission in September last year for the first global stocktake. Looking ahead, SBSTA 60 will be held from 3 to 13 June in Bonn and COP 29 from 11 to 22 November in Azerbaijan. We extend our appreciation to the government of Azerbaijan for hosting COP 29 and warmly welcome your participation.

Expectation for MEPC 81

Distinguished delegates, the UNFCCC secretariat would like to encourage the Committee to make substantial progress at this session, in particular regarding the development of candidate midterm measures.

In the decision on the outcome of the first global stocktake, the CMA:

- Noted the availability of feasible, effective and low-cost mitigation options in all sectors to keep 1.5 °C within reach in this critical decade with necessary cooperation and support;
- Resolved to pursue further efforts to limit the temperature increase to 1.5°C; and
- Called on Parties to contribute to global efforts towards deep, rapid and sustained emission reductions in line with 1.5 °C pathways, in a nationally determined manner, as already mentioned.

In this context, the discussion on development of candidate midterm measure(s) is encouraged to consider the following:

- Maximizing contribution of midterm measures, noting that these will enter into force in 2027, to both the 2030 indicative checkpoint for greenhouse gas emissions and levels of ambitions for the uptake of zero or near-zero greenhouse gas emission technologies and fuels by 2030, utilizing all feasible and cost-effective means while minimizing negative impacts on States; and
- Further strengthening support for developing countries to implement the 2023 strategy, including for achieving both the 2030 indicative checkpoint for greenhouse gas emissions and levels of ambitions for the uptake of zero or near-zero greenhouse gas emission technologies and fuels by 2030.

MEPC80 and COP 28 created a moment of hope in this critical decade. Let's not waste it. Let's harness this positive energy to drive breakthrough progress together. I look forward to working with you this week to collectively keep the 1.5°C alive in a just, orderly and equitable manner.

We kindly request the statement to be included in the report of the Committee.

Thank you, Mr. Chair."

On MEPC 81/WP.8

Statement by the delegation of Argentina

"Señor Presidente,

Mi delegación desea hacer referencia al documento WP8, Informe del Grupo de Trabajo sobre GHG.

Ante todo, quisiéramos agradecer al Sr. Svenung Oftedal por su conducción, por la sabiduría con la que nos guía para arribar a soluciones consensuadas, y por su paciencia. Así también, agradecemos a todas las delegaciones por su espíritu de colaboración. Finalmente, expresamos nuestro agradecimiento a todos los colegas de la División de Medio Marino bajo la Sra. Heike Deggimm: Roel Honders, Tianbing Huang y Aidée Saucedo.

Quisiéramos hacer algunos comentarios sobre el informe, en particular su Anexo 3:

- Apoyamos el camino a seguir presentado por el grupo de trabajo, en la voluntad de trabajar juntos en este importante tema y avanzar en el diseño de las medidas de mediano plazo,
- La ilustración que se nos presenta en el Anexo 3 es preliminar y no prejuzga cambios o ajustes que puedan realizarse en línea con los posibles resultados de nuestro trabajo en el desarrollo de la canasta de medidas, porque esta es una ilustración tiene sólo un sentido práctico, mientras nuestra guía continúa siendo la Estrategia 2023.
- También es importante destacar que se habrá de tomar debidamente en cuenta la evaluación comprensiva del impacto sobre los Estados de la canasta de medidas candidatas a medio plazo. Tanto las conclusiones preliminares como el informe final

de la evaluación de impacto, en sus cinco tareas, deben ser tenidos en cuenta, debidamente, para el diseño de las medidas.

- En el trabajo que tenemos por delante debemos recordar que el objetivo final de la estrategia es la reducción de las emisiones de GHG procedentes de los buques y la transición energética de este sector con el menor impacto negativo posible, en particular sobre los países en desarrollo, incluidos los PMEs y los SIDS. Es importante diseñar una medida que se ajuste a este objetivo.
- La recaudación de ingresos como objetivo en sí mismo no es el mandato plasmado en la Estrategia. Necesitamos evitar buscar reemplazar el objetivo de la Estrategia y el mandato de la OMI de reducir GHG de buques por el de abordar la cuestión más amplia de la financiación climática a través de la industria marítima y la OMI, que no corresponde. Esto explica, en parte, por qué consideramos que un gravamen no es la herramienta adecuada para alcanzar los objetivos de la estrategia.

Es importante ser claro: el impuesto no es la herramienta para la transición. Hay otras herramientas mejores, con menor impacto negativo sobre los países en desarrollo dependientes del comercio por buque y distantes de sus mercados, y al menos igualmente ambiciosas, sino más.

Señor Presidente, quisiera hacer una reflexión y sugerencia sobre un aspecto que será importante cuando se presente el informe de la evaluación de impacto: la traducción a los idiomas oficiales de la OMI. Ese no fue el caso en la evaluación de la medida de corto plazo, y sería importante tenerlo en cuenta para el informe que tendrá lugar más adelante este año.

Dicho lo anterior, quisiera expresar el compromiso de la Argentina de continuar trabajando con los demás miembros en un espíritu de consenso para diseñar dichas herramientas de manera que se implemente la estrategia y se cumplan los objetivos de cero emisiones netas de GHG para 2050. Muchas gracias."

Statement by the delegation of Brazil

"We come again to the end of another two weeks of interaction, negotiation and yet another encouraging set of results.

We have agreed on a framework that should guide the work forward and allow for us to step out of our pre-conceived schemes and work together towards our beacon which is the 2023 Strategy.

In the build up to the next events, chair, we have a particular concern with misinformation. We have seen a number of interpretations and communication pieces that simply do not correspond to the facts. While the freedom of opinion is a sacred right for us, as all are entitled to their own views, and while all divergences are welcome in a free debate, it all comes with responsibility. Imprecision or misinformation simply do not help us in our hard task of building trust and moving forward. We come from an understanding that all stakeholders in this room and outside of it, from NGOs to the press to the industry and the members, we are all here in good faith, trying to build, TOGETHER, a solution for our common challenge. So let´s have a few points clarified beyond any doubts, for the benefit of this process.

First and foremost, there is no contradiction between the fight against climate change and the fight against inequality - both within countries and among them. Both objectives are legitimate and urgent, and therefore must be compatible and pursued simultaneously. That's what we are doing at the IMO.

Brazil is committed to the objectives of the Paris Agreement and to a rapid and safe transition in the maritime sector, but as in any international regulatory exercise, we understand that, among all the tools available for this, we must choose the one that causes the least possible damage to jobs and income in developing countries.

In Brazil´s understanding, a flat levy is not the measure capable of producing the transition we all want, nor the only way to raise needed revenue. There is simply no scientific evidence that would sustain that claim with any degree of confidence. According to studies carried out in Brazil, it has the potential to be extremely harmful and increase inequality between developed

and developing countries, mainly in Latin America and Africa. Therefore, we must work with other tools, better suitable for all national realities.
A flat levy is not synonymous with "climate ambition". In fact, it has nothing to do with ambition at all. The ambition lies in the regulatory measures that Brazil is actively helping to build. A flat levy would, in fact, be a measure aimed at raising resources - and in the end it would be mainly countries in the global south bearing the costs of climate action, contrary to the commitments made by developed countries under the climate regime. Is that fair? Is that just? Is that equitable? These words only have any meaning if applied to all of us, not some. There is no sustainability, if all the three aspects it comprises, – namely environmental, social and economic sustainability– are duly considered.
In the work ahead, friends, let us together fight misinformation. Brazil remains actively engaged in the process, maintaining contact with all countries and actors in the sector, in search of a consensus solution, which, as far as possible, addresses all issues inherent to the challenge. We are open to all of you in this room and outside of it to further explain our views and discuss solutions, as many times as necessary, in order to prevent misundertandings that could threaten our future work.
Chair, the agreements reached in the last two weeks allowed for more trust building, for more understanding across delegations and again for hope. The framework agreed upon is meant to bring us all out of our comfort zones and into the zone of mutual responsibility, of looking for ways to protect and address our main concerns while also protecting and addressing others'. Once again, and thanks to the excellent work by our chair, the secretariate and all the colleagues, we have been given a chance to show we care for one another. In the months to come until September, let's take this chance."

Statement by the delegation of Chile

" Señor Presidente,
Queremos sumarnos a los agradecimientos al Sr. Oftedal, a la Secretaría y a todos los miembros que participaron en el Grupo de Trabajo.
Compartimos lo expresado por la delegación de Argentina respecto a la elaboración de las medidas de mediano plazo de reducción de gases de efecto invernadero, queremos agradecer el trabajo del Grupo.
La estructura que se acordó es un proyecto para desarrollar un marco y continuar con el trabajo que hemos venido desarrollando, pero no debemos olvidar que es la Estrategia de Gases Efecto Invernadero 2023 la guía, como documento formal acordado el año recién pasado.
En esa línea, Chile comparte que un impuesto universal no es la mejor herramienta y debemos diseñar una herramienta que sea ambiciosa y que impacte lo menos posible.
Nuestro país continuará trabajando con todos para lograr el objetivo que tenemos por delante, en este espíritu de colaboración que se ha mostrado en estas semanas."

Statement by the delegation of the Cook Islands

"Kia Orana,
We acknowledge and welcome the statements delivered thus far this morning and are appreciative of them all as they are reflective of the wide range of issues we still need to address and demonstrate the needs, concerns and aspirations of all committed to the MARPOL Annex VI amendments that when developed will ensure the shipping sector achieves the 2050 net zero targets laid out in the 2023 revised GHG strategy.
As you know despite the good progress made in our discussions over the past two weeks we, that is the Cook Islands, have not yet hoisted our colours to any of the proposed measures made and there is a good reason for that……

Chair, We continue to call upon the proponents of the different proposals here before us to arrive to MEPC 82 prepared to enlighten and demonstrate to the Committee as to how the measures they propose will ensure the safe, secure, timely, cost effective, i.e affordable freight cost, sustainable shipping to our remote islands state without which our island life and culture cannot be sustained.
It is that simple."

Statement by the delegation of Fiji

"Thank you Mr. Chair.
Firstly, Fiji takes this opportunity to thank the GHG Working Group and all who took part in the discussions from last week in coming to the table with a spirit of cooperation.
As our Minister had stated in his opening statement on Monday, "It is imperative that we collectively recognize the substantial challenges posed by climate change and the urgent need for action within the maritime industry."
The progress made over the past two weeks has been commendable, signalling a positive step forward in addressing the challenges posed by the climate crisis within the maritime industry. However, we believe there is still room for improvement. We echo the statements made by the Republic of Marshall Islands, Kiribati and Solomon Islands, that we must Maintain focus on the overarching goal of creating a fair, inclusive, and environmentally sustainable future for everyone, aligned with the objectives of the Sustainable Development Goals.
Our delegation looks forward to the deliberations and further collaborations that will take place in the coming months and Fiji reaffirms our commitment to working positively with all member states. Let us remain steadfast in our commitment to the 1.5-degree limit goal, ensuring a just and equitable transition that leaves no one behind.
Thank you Chair."

Statement by the delegation of France

"Merci Monsieur le Président,
La délégation française ne souhaite pas rouvrir les débats sous ce point et remercie très vivement le Président, tous les collègues et bien sûr le Secrétariat pour l'excellente conduite des travaux et coopération qui ont présidé à nos réunions.
Au nom des délégations francophones dont je me fais la porte-parole, à leur demande, nous nous permettons de soulever un point d'intérêt général concernant la participation des délégations à ces réunions qui sont très importantes pour l'ensemble des Etats-membres. A cet égard, nous ne pouvons que regretter l'absence de documents dans toutes les langues officielles et la tenue de réunions intersessionnelles se tenant uniquement en anglais. Tout en comprenant la difficulté d'assurer des réunions supplémentaires qui n'étaient pas prévues dans le calendrier lors de l'adoption du biennium, nous attirons à nouveau l'attention du Secrétariat sur le respect de la résolution sur le multilinguisme adoptée lors de la 33ème Assemblée et nous tenons à sa disposition pour définir les priorités en la matière. Nous demandons en particulier que les documents les plus importants, comme par exemple les résultats de l'étude d'impact attendus pour juillet, soient bien disponibles dans toutes les langues pour permettre à toutes les délégations de participer aux négociations, sur un pied d'égalité.
Je vous remercie."

Statement by the delegation of Jamaica

"Thank you Chair.
Good day to all.
Jamaica joins the other Member States in thanking the Chair and the Secretariat of the Working Group on Reduction of GHG Emissions from Ships for their tireless effort and leadership and

we congratulate the dedication of the members of the Working Group, all of which has brought us to the outcomes contained in the report of the working group and reflects the hard work over the past two weeks.
Jamaica remains committed to working toward the common objective of reducing GHG emissions from international shipping aligned with the 1.5-degree goal in keeping with the spirit of continued cooperation while being particularly mindful of the vulnerabilities of SIDs and LDCs including those in the Caribbean and the Pacific, to the impacts of climate change.
We recognize that progress has been made in the Working Group and that there is a need for further work intersessionally and look forward to the results of the Expert Workshop particularly on the modelling of revenue disbursement and the final report of the comprehensive impact assessment on States.
Finally, chair, we express our condolences to the families of the seafarers who lost their lives in the tragic accident earlier this week and also express our sympathies to the delegation of South Africa for the loss of their colleague.
Thank you Chair."

Statement by the delegation of Madagascar

"Merci M. le Président,
Nous exprimons nos sincères remerciements au président du groupe de travail, au secrétariat et à tous les participants qui ont produit un travail compréhensif et témoin d'une approche participative et inclusive. Nous espérons que les travaux vont continuer dans le même état d'esprit et que les mesures puissent être adoptées en tenant compte de la situation et des intérêts de tous les pays.
Nous souhaitons ainsi réaffirmer notre ferme volonté de continuer à travailler étroitement avec l'OMI et toutes les parties prenantes pour arriver à atteindre l'objectif de décarbonation du transport maritime, tel qu'établi par la Stratégie révisée de l'OMI adoptée en 2023.
Profitant de cette occasion, M. le Président, Madagascar en tant que pays francophone, souhaite relayer la requête que les documents présentés et utilisés lors des séances du groupe de travail sur la réduction des gaz à effet de serre par les navires, ainsi que pour l'Atelier des Spécialistes à venir soient également disponibles en langue française.
M. le Président, nous tenons à rappeler que l'un des principes fondamentaux de la lutte contre les changements climatiques est de ne laisser aucun pays de côté, et nous sommes tous conscients de l'importance des décisions à prendre dans ce cadre. Ne laissons donc pas des contraintes linguistiques constituer des obstacles mais de faire ce qui est juste pour que tous les pays puissent participer entièrement et pleinement aux débats.
Ainsi, nous souhaitons manifester notre soutien à la proposition des délégations d'Argentine et de la France.
Nous demandons à ce que la présente déclaration soit attachée au rapport du Comité.
Merci M. le Président."

Statement by the delegation of the Marshall Islands

" Thank you Chair.
I bring warm greetings of "Iakwe" to you all from the people and Government of the Republic of the Marshall Islands.
Assembled delegates, esteemed guests, and distinguished members of the International Maritime Organization, it is both an honor and a privilege to address you today on a matter of utmost importance—ensuring a sustainable future for our islands, our oceans, our future generations and our planet!
All protocols observed.
Mr. Chair, for our communities on the frontline, the deepening climate emergency is a very real and very now crisis, one that right now is threatening our very homes and survival. The flights out of Majuro today are full of families fleeing their ancestral homes. Before I proceed with my

brief statement, I wish to share a bit of history with you all today. Back home within our communities, there are groups of families and friends that have already experienced the impacts of forced migration first hand. I am talking about 78 years ago.

Mr. Chair, from 1946-1958, the United States government conducted their nuclear testing program over our northern atolls of Enewetak and Bikini. A total of 67 atomic and hydrogen bombs over a span of 12 years. Among the 67 nuclear weapons, the renowned "Bravo", which was the codename of the bomb, was the biggest and most powerful atmospheric nuclear weapon ever detonated by the US government. It was 1,000 times more powerful than the ones dropped on Hiroshima and Nagasaki in Japan.

Mr. Chair, of course prior to the testing, people had to be removed (not temporarily but permanently) from their lands, where culture and traditional heritage have been cherished and inherited from generation to generation for some 4000 years. Today, I am disheartened to say that these involuntary migrants continue to be faced with hardships and still experience the affliction of being refugees outcast within different communities in-their own country. 78 years later, they have not returned to their homelands due to the high level of radioactivity measures that are still present within these islands.

Mr. Chairman, I share this short history because as a nation, highly vulnerable to climate change and sea level rise, we definitely do not want to go through another wave of forced migration. We have lived through it for the last 78 years and still breathe through its calamities. Now we are being forced to re-live it.

Today, we stand at a critical juncture in human history, where the decisions we have made this week will reverberate for generations to come. The urgency of addressing climate change and its impacts on our environment demands bold and decisive action. The 1.5-degree Celsius target outlined in the Paris Agreement serves as our guiding light, our beacon of hope in a world fraught with uncertainty.

At the heart of our endeavor lies the imperative to align shipping's agenda with the 1.5-degree target. This necessitates a fundamental shift in the way we approach maritime governance and regulation. We must recognize that the shipping industry, while indispensable to global trade and commerce, also carries a significant environmental burden. Therefore, it is incumbent upon us to embrace the principle of "polluter pays" and implement economic measures that incentivize sustainability, penalize environmental degradation, and drive shipping's green transition. To achieve the transition we must go through requires a paradigm shift of unprecedented scale and scale. Weak or cheap half measures are not available to us if we are to align with 1.5.

However, the question inevitably arises: what do we do with the revenue generated as a byproduct of such measures? This is where our commitment to the principles of equitable transition comes into play. We must ensure that the burden of transition does not disproportionately fall upon the most vulnerable communities and economies. Rather, we must strive for fairness and justice in the distribution of resources and benefits.

Furthermore, we must recognize that the transition to a sustainable shipping industry is not solely an environmental imperative but also an economic and social one. It presents us with an opportunity to create new green jobs, foster innovation, and promote social cohesion. Therefore, as we chart our course forward, let us not lose sight of the broader vision of a just, equitable and sustainable future for all in line with the Sustainable Development Goals.

Equitable transition must not only guide our substantive outcomes but also the process we employ to reach them. It requires inclusivity, transparency, and meaningful engagement with all stakeholders, including civil society organizations, indigenous communities, and marginalized groups. Their voices must be heard, their concerns addressed, and their rights respected. Last week we heard a significant and growing convergence of the voices of our smaller states on this matter.

We must also get the technical aspects of this transition right. That means a simple GFS that follows a GHG price, but is enacted at the same point, to provide long term certainty for the industry. It means dealing with emissions on a well to wake basis, for both the technical and

economic element. And it means the most rigorous standards of environmental integrity for all aspects of the Lifecycle Assessment Guidelines.
Therefore, let us reaffirm our commitment to the 1.5-degree target, to the principle of polluter pays, and to the principles of equitable transition. Let us seize this moment as an opportunity to shape a better world for ourselves and for future generations. Together, we can chart a course towards a more sustainable, inclusive, and resilient shipping industry, in which safe and just zero emission shipping connects all regions of the world, and advances the prosperity of every country.
We have made good progress these last two weeks, but much work remains. We look forward to engaging with all interested parties intersessionally to place us in the best possible position when we return in September.
Thank you."

Statement by the delegation of Samoa

"Thank you Chair and a very good morning to All,
Let us join the others in conveying our condolences to all those who have been affected by the tragic event involving the Republic of Korean flagged tanker vessel.
With the matter at hand, Samoa would like to thank the Chair and all members of the GHG Emissions Reduction Working Group for the collaborative efforts reflecting in the report provided. We would also like to reiterate that the reason why we have these deliberations on relevant measures to reduce GHG emissions is all because of the climate change negative impacts caused by those large contributors of GHG emitters.
Therefore, we would like to urge the IMO and this Committee to ensure that whatever measures that would be developed, should not have any further impact on the developing countries including SIDS and LDCS. We believe that, it is the responsibility of those who contributed largely on GHG emissions to assist in all efforts towards a just and equitable transition as well as achieving our GHG emission goals in whatever way possible.
Thank you, Chair. "

ITEM 8

Statement by the delegation of Saudi Arabia

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شكرًا لك، السيد الرئيس، السادة المندوبون،
فيما يخص إرشادات تنظيف حبيبات البلاستيك، ترى المملكة العربية السعودية ضرورة الاعتراف بأن حبيبات البلاستيك، على الرغم من كونها جزءًا من مشكلة البلاستيك الأوسع، فهي غير خطرة ويتم نقلها بأمان. نحن نرى أن أي إرشادات للتنظيف يجب أن تشمل جميع المواد غير الخطرة. فالتسرب تسرب، ويجب أن يكون الاستجابة لحبيبات البلاستيك فعالة كما ستكون للخشب أو الزجاج أو المعدن. يجب أن يكون التعامل مع هذه المواد عند استردادها متسقًا عبر اللوحة.
تدعو المملكة العربية السعودية إلى تدابير نقل فعالة لمنع أي خسارة بحرية، مؤكدة على الضرورة البيئية. نحن ندعو أيضًا إلى الحاجة لتمييز واضح ضمن مناقشاتنا بين تلوث البلاستيك والبلاستيك المنقول كبضائع.
بالإضافة إلى ذلك، من الضروري التمييز بين الاستجابة لتسرب حبيبات البلاستيك وتسرب النفط أو المواد الخطرة والضارة .(HNS) الخصائص الفيزيائية والآثار البيئية لحبيبات البلاستيك مختلفة، مما يتطلب نهجًا مخصصًا للاستجابة للتسرب لا يتخلط مع المواد الأخرى.
ومن المهم أيضًا التأكيد على المناقشات الجارية تحت معاهدة الأمم المتحدة للبيئة الجديدة باسم "إنهاء تلوث البلاستيكي". ستثري نتائج هذه المعاهدة فهمنا لدورة حياة البلاستيك، بما في ذلك نقلها. في ضوء ذلك، نعتقد أنه من الحكمة انتظار هذه النتائج قبل تحديد إرشاداتنا بشكل نهائي.في الختام، أحث هذه اللجنة على النظر في نهج شامل لا يعتمد على المادة لإرشادات تنظيف التسربات غير الخطرة والسماح بالاستفادة من الرؤى المستنيرة من مناقشات معاهدة البلاستيك، لضمان أن تكون أفعالنا مبنية على أساس سليم وفعال.
"شكراً لكم..

"Thank you, Mr. Chair, distinguished delegates,
In reference to Plastic Pellets Clean-up Guidelines, Saudi Arabia is in the view of the need to recognize that plastic pellets, while indeed part of the broader plastic issue, are non-hazardous and safely transported. It is our view that any clean-up guidelines should be inclusive of all non-hazardous materials. A spill is a spill, and the response should be as effective for pellets

as it would be for wood, glass, or metal. The handling of these materials upon recovery must be consistent across the board.
The Kingdom of Saudi Arabia advocates for effective transportation measures to prevent any maritime loss, underscoring the environmental imperative. We also call attention to the need for a clear distinction within our discussions between plastic pollution and plastics transported as commodities.
Additionally, it is imperative to differentiate the response to plastic pellets from that of oil spills or Hazardous and Noxious Substances (HNS). The physical properties and environmental impacts of plastic pellets are distinct, necessitating a tailored approach to spill response that is not conflated with other substances.
Moreover, it's important to highlight the ongoing discussions under the United Nation Enviromental Assembly (UNEP) new treaty named "End Plastic Pollution." This treaty's outcomes will inform our understanding of plastics' lifecycle, including their transportation. In light of this, we believe it is wise to await these results before finalizing our guidelines.
In closing, I urge this committee to consider a comprehensive, material-agnostic approach to non-hazardous spill clean-up guidelines and to allow for the informed insight from Plastic treaty discussions, ensuring our actions are well-founded and effective.
Thank you."

Statement by the delegation of United Arab Emirates

"Thank you Mr. Chair, sorry for the interruption. We will be brief. We support the intervention of Saudi Arabia and we request that our statement be attached to the final report."

ITEM 11

Statement by the delegation of the Russian Federation

"Уважаемый господин Председатель,
В настоящее время Правилами 13 и 14 Приложения VI к Конвенции МАРПОЛ районами ECA обозначены Балтийское море; Северное море; Североамериканский район контроля выбросов и район контроля выбросов Карибского моря США. То есть районами ECA являются районы интенсивного судоходства; с прибрежными районами, характеризующимися высокой плотностью населения; с чувствительной экосистемой или требующей защиты серьезно нарушенной экосистемой, как, например, Балтийское море.
Процедура назначения ECA, изложенная в Дополнении III к Приложению VI к МАРПОЛ, предусматривает, что соответствующее предложение рассматривается в ИМО в случае, если оно подтверждается доказанной необходимостью предотвращения, сокращения или сохранения под контролем загрязнения воздушной среды окислами серы и азота.
Предложение должно включать, среди прочего, оценку воздействия выбросов на экосистемы и здоровье человека, с учетом характера и интенсивности судоходства, результаты которой должны подтверждать предложенную меру регулирования.
Представленные предложения Канады и Норвегии, по нашему мнению, не соответствуют указанным критериям назначения ECA и идут против самого принципа назначения ECA, заложенного в МАРПОЛ.
В частности, по сравнению с другими уже назначенными ECA, судоходство в районах, предложенных Канадой и Норвегией в качестве будущих ECA, является незначительным или практически отсутствует. В этих районах нет больших городов или портов, которые могут быть сопряжены с повышенными локальными выбросами с судов, негативно влияющими на население. В прибрежных территориях указанных районов не проживает большое количество населения, или же население отсутствует совсем, что

подтверждается представленными в документах Норвегии и Канады статистическими данными.
Мы готовы представить более детальные комментарии в ходе рассмотрения предложений на технической группе.
В целом считаем, что предлагаемые меры контроля через универсальный инструмент регулирования – Конвенцию МАРПОЛ, являются избыточными и непропорциональными реальному уровню угрозы морской среды и населению от судоходства в указанных районах. Полагаем, что при необходимости, дополнительные меры контроля выбросов окислов азота и серы могут быть введены Канадой и Норвегией на национальном уровне в водах под своей юрисдикцией и в объеме, допускаемом Конвенцией ООН по морскому праву для соответствующих морских пространств. Использование для этого механизмов МАРПОЛ представляется необоснованным. Соответственно, на данном этапе мы не поддерживаем представленные предложения."

ITEM 15

Statement by the delegation of Bangladesh

"Thank You Chair, Good day to all distinguished delegates.
Our delegation would like to join others in expressing our heartfelt condolences to the distinguished delegates of south Africa and express our condolences sympathies to the distinguished delegates of Republic of Korea on the loss and missing seafarers through tragic accident of Keu yang Sun. We also commend the brave rescue efforts by Japanese coast guard in this regard.
Bangladesh as a co-sponsorship of the paper MEPC 81/15/5 put emphasis on the statement made by the distinguished delegates.
Chair, the document under discussion critically examines the interplay between the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships 2009 (HKC) and the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (BC).
Chair, The entry into force of the HKC by next year June represents a significant milestone in our collective efforts to ensure the safe and environmentally sound recycling of ships for a level playing field by all stakeholders at the global level. This Hong Kong Convention not only elevates industry standards but also introduces necessary transparency within the realm of ship recycling.
Chair As a major ship recycling states and a co-sponsor of the document under discussion reflects our government commitment by acceding to HKC last year June which warrants our concern in addressing and resolving the legal uncertainties that may emerge from the concurrent application of the HKC and the BC, otherwise chair, we believe the shipping and ship recycling Industry will be in dilemma with ambiguity and the spirit of global standard setting for ship recycling industry through the implementation of HKC might be lost somewhere.
Chair, as we stand on the brink of the HKC's enforcement, it is imperative to address this potential legal inconsistencies between these two United Nations conventions. Specifically, the scenarios detailed in the document vividly illustrate the practical and legal challenges that could confront shipowners and recycling facilities, potentially hindering the uniform and effective implementation of the HKC.
In light of the outlined concerns, we echo the call for legal clarity and certainty to ensure that compliance with the HKC does not inadvertently result in sanctions under the BC. Achieving harmonization between these conventions is paramount to fostering a regulatory environment conducive to the safe and environmentally sound recycling of ships on a global scale.
In conclusion chair, we urge this esteemed Committee to consider the proposals contained within document MEPC 81/15/5, notably the encouragement of further cooperation between the Secretariats of the HKC and the BC.

This collaborative effort is essential to clarifying potential uncertainties and establishing a clear and unified understanding of the legal landscape post-HKC implementation while recognizing the importance of legal clarity for the seamless implementation of the Hong Kong Convention. With that said chair, I thank you and request our statement be attached to the final report of the committee."

Statement by the observer from ITF

"Thank you Chair.
The ITF thanks the Secretariat and the co-sponsors for both MEPC 81/15/1 and MEPC 81/15/5. We commend all stakeholders' endeavours over the years to enhance safety and environmental soundness of ship scraping and recycling. We would like to join the celebration of entry into force of the Hong Kong Convention next year.
The ITF supports a proposal in MEPC 81/15/5 that clarification between Hongkong Convention and Basel Convention is necessary.
Further, ITF would like to draw the Committee's attention to general points from seafarers' perspectives.
Hongkong Convention cannot regulate what happens in land expect for ports and shipyards, as the scope is limited to the IMO's remit. However, the Convention requires the competent authorities to ensure all waste is safely removed from the ship, packaged, labelled and handed over for suitable disposal, but treatment, storage and disposal facilities (TSDF) are not. Chair and distinguished delegates, those ships that are going to be recycled or scraped are transported by seafarers. Any existence of harmful substances and locations of such substances which could cause potential exposure to seafarers onboard must be informed by seafarers. The Convention also requires what certificates and declarations a ship should have to prove the ship is ready to be handed to the yard (Covered in Art 21, Ch 4 in Annex, v.imp Appendix 1,2 and 3).
To ensure the management plan on board the IMO developed several Guidelines and the ITF would like to indicate one specific set, which addresses worker safety and the chain of responsibility, accountability and transparency. 2012 GUIDELINES FOR SAFE AND ENVIRONMENTALLY SOUND SHIP RECYCLING (MEPC resolution.210(63)).
In 2008, a tripartite working group had discussions of ILO, IMO and Basel Convention and how to improve safe working environment for workers.
The ITF looks forward to the next chapter.
Thank you, Chair."