MARITIME AND PORT AUTHORITY OF SINGAPORE
SHIPPING CIRCULAR
NO. 06 OF 2022

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12 April 2022

Applicable to: Shipowners, managers, operators, agents and masters of Singapore-registered ships

RESOLUTIONS ADOPTED BY THE 77th SESSION OF THE MARITIME ENVIRONMENT PROTECTION COMMITTEE (MEPC 77) OF THE INTERNATIONAL MARITIME ORGANISATION (IMO)

1. This circular informs the Shipping Community of the resolutions adopted by MEPC 77[1].

2. MEPC 77 adopted the following resolutions:

a. Resolution MEPC.340(77) – **2021 Guidelines for Exhaust Gas Cleaning Systems (EGCS)**

The resolution adopts the 2021 EGCS guidelines and will be applicable to:

- *EGCS installed on ships the keels of which are laid or which are at a similar stage of construction on or after 1 June 2022; or*
- *EGCS installed on ships the keels of which are laid or which are at a similar stage of construction before 1 June 2022 which have a contractual delivery date of EGCS to the ship on or after 1 June 2022 or, in the absence of a contractual delivery date, the actual delivery of the EGCS to the ship on or after 1 June 2022; or*
- *amendments, as those specified in paragraphs 4.2.2.4 or 5.6.3 of the 2021 EGCS Guidelines, to existing EGCS undertaken on or after 1 June 2022, when allowing the use of an exhaust gas cleaning system in accordance with regulation 4 of MARPOL Annex VI.*

b. Resolution MEPC.341(77) – **Strategy to Address Marine Plastic Litter from Ships**

The resolution adopts the Strategy to Address Marine Plastic Litter from Ships to guide, monitor and oversee the timely and effective implementation of the Action Plan as set out in the annex to the resolution.

[1] The 77th session of Maritime Environment Protection Committee (MEPC 77) was held remotely from 22 to 26 November 2021.

c. Resolution MEPC.342(77) – **Protecting the Arctic from Shipping Black Carbon Emissions**

The resolution urges Member States and ship operators to voluntarily use distillate or other cleaner alternative fuels or methods of propulsion that are safe for ships and could contribute to the reduction of Black Carbon emissions from ships when operating in or near the Arctic.

3. Any queries relating to this circular should be directed to MPA Shipping Division via email at shipping@mpa.gov.sg.

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INTERNATIONAL MARITIME ORGANIZATION

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MARINE ENVIRONMENT PROTECTION COMMITTEE
77th session
Agenda item 16

MEPC 77/16/Add.1
14 January 2022
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REPORT OF THE MARINE ENVIRONMENT PROTECTION COMMITTEE ON ITS SEVENTY-SEVENTH SESSION

Attached are the annexes to the report of the Marine Environment Protection Committee on its seventy-seventh session (MEPC 77/16).

LIST OF ANNEXES

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ANNEX 1

RESOLUTION MEPC.340(77)
(adopted on 26 November 2021)

2021 GUIDELINES FOR EXHAUST GAS CLEANING SYSTEMS

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

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

RECALLING ALSO that, at its fifty-eighth session, the Committee adopted, by resolution MEPC.176(58), a revised MARPOL Annex VI which significantly strengthens the emission limits for sulphur oxides (SO_X),

NOTING that regulation 4 of MARPOL Annex VI allows the use of an alternative compliance method at least as effective in terms of emission reductions as that required by the Annex, including any of the standards set forth in regulation 14, taking into account guidelines developed by the Organization,

RECALLING that, at its fifty-ninth session, the Committee adopted, by resolution MEPC.184(59), the *2009 Guidelines for exhaust gas cleaning systems*,

RECALLING ALSO that, at its sixty-eighth session, the Committee adopted, by resolution MEPC.259(68), the *2015 Guidelines for exhaust gas cleaning systems* (hereinafter referred to as the "2015 EGCS Guidelines"),

RECOGNIZING the need to update the 2015 EGCS Guidelines,

HAVING CONSIDERED, at its seventy-seventh session, draft amendments to the 2015 EGCS Guidelines, prepared by the Sub-Committee on Pollution Prevention and Response at its seventh session,

1 ADOPTS the *2021 Guidelines for exhaust gas cleaning systems* (hereinafter referred to as the "2021 EGCS Guidelines"), as set out in the annex to the present resolution;

2 INVITES Administrations to implement the 2021 EGCS Guidelines and apply them to exhaust gas cleaning systems installed on ships the keels of which are laid or which are at a similar stage of construction on or after 1 June 2022; or exhaust gas cleaning systems installed on ships the keels of which are laid or which are at a similar stage of construction before 1 June 2022 which have a contractual delivery date of EGCS to the ship on or after 1 June 2022 or, in the absence of a contractual delivery date, the actual delivery of the exhaust gas cleaning system to the ship on or after 1 June 2022; or amendments, as those specified in paragraphs 4.2.2.4 or 5.6.3 of the 2021 EGCS Guidelines, to existing exhaust gas cleaning systems undertaken on or after 1 June 2022, when allowing the use of an exhaust gas cleaning system in accordance with regulation 4 of MARPOL Annex VI;

3 REQUESTS Parties to MARPOL Annex VI and other Member Governments to bring the 2021 EGCS Guidelines to the attention of shipowners, ship operators, shipbuilders, marine diesel engine manufacturers and any other interested groups;

4 INVITES Administrations to provide for discharge water data collection as described in appendix 3 of these Guidelines, and to also apply that appendix when undertaking related sampling from exhaust gas cleaning systems that have been approved in accordance with the earlier versions of the EGCS Guidelines;

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

6 ALSO AGREES that these Guidelines supersede the 2015 EGCS Guidelines adopted by resolution MEPC.259(68).

ANNEX

2021 GUIDELINES FOR EXHAUST GAS CLEANING SYSTEMS

1 INTRODUCTION

1.1 MARPOL Annex VI requires ships to use fuel oil with a sulphur content not exceeding that stipulated in regulations 14.1 or 14.4. Regulation 4 allows, with the approval of the Administration, the use of an alternative compliance method at least as effective in terms of emission reductions as that required by the Annex, including the standards set forth in regulation 14. The Administration of a Party should take into account any relevant Guidelines developed by the Organization pertaining to alternatives provided for in regulation 4.

1.2 These Guidelines have been developed to allow for the testing, survey, certification, and approval of Exhaust Gas Cleaning Systems (EGCSs) in accordance with regulation 4 of MARPOL Annex VI.

1.3 Equivalency with the relevant requirements of regulation 14 of MARPOL Annex VI should be demonstrated by using these Guidelines as a basis of compliance with the relevant Emission Ratio limit value as given in table 1. Where the design or operation of an EGCS requires controls in addition to those given in these Guidelines in order to meet the requirements of regulation 4.4 of the above-mentioned Annex, they should be subject to special consideration by the Administration and should be communicated to the Organization when submitting the notification required by regulation 4.2 of MARPOL Annex VI.

Table 1: Fuel oil sulphur limits in regulations 14.1 and 14.4 and corresponding Emission Ratio limit values

Fuel oil sulphur content (% m/m)	Emission Ratio SO_2(ppm)/CO_2(% v/v)
0.50	21.7
0.10	4.3

Note: The use of the above Emission Ratio limit values is only applicable when using petroleum-derived distillate or residual fuel oils. See appendix 2 for the assumptions and rationale which form the basis of the Emission Ratio method.

1.4 These Guidelines are recommendatory in nature; however, Administrations are invited to base the implementation of the relevant requirements of regulation 4 of MARPOL Annex VI on them.

2 GENERAL

2.1 Purpose

2.1.1 The purpose of these Guidelines is to specify the criteria for the testing, survey, certification and verification of EGCSs under regulation 4 of MARPOL Annex VI to ensure that they provide in service, at any operating load point at which they are to operate, including during transient operation, effective equivalence to the requirements of regulations 14.1 or 14.4 of MARPOL Annex VI, as applicable.

2.1.2 These Guidelines describe two schemes for approval of an EGCS: Scheme A (system certification with in-service continuous operational parameter monitoring and periodic emission checks) and Scheme B (continuous emission monitoring by means of an approved monitoring system together with periodic operational parameter checks):

.1 in Scheme A, the EGCS is subject to approval by the Administration and should be as given in section 4 subject to performance tests, sea trials or other similar physical tests that verify that the system in service will result in the intended performance; and

.2 in Scheme B, the exhaust gas monitoring system of the EGCS is subject to approval by the Administration and should be as given in section 5. Approved exhaust gas monitoring system should continuously indicate the Emission Ratio while the EGCS is in operation, allowing verification against the applicable limit.

2.1.3 Emission testing in relation to either Scheme A or Scheme B should be undertaken, as appropriate, as given in section 6.

2.1.4 Data recording, retention and the preparation of reports using that data in relation to either Scheme A or Scheme B should be, as appropriate, as given in section 7.

2.1.5 Details of the monitoring systems for exhaust emissions, operating parameters, inlet water, washwater and discharge water in relation to either Scheme A or Scheme B should be documented, as appropriate, as given in section 8.

2.1.6 For ships which are to use an EGCS in part or in total as an approved equivalent to the requirements of regulations 14.1 and/or 14.4 of MARPOL Annex VI, there should be an approved SO_X Emissions Compliance Plan (SECP) as given in section 9.

2.1.7 Discharge water monitoring which is equally applicable to Scheme A and Scheme B should be undertaken as given in section 10.

2.2 Application

2.2.1 These Guidelines apply to any EGCS as applied to fuel oil combustion unit(s), excluding shipboard incinerators, installed on board a ship.

2.2.2 For the purpose of these Guidelines, the term "EGCS" should be generally, but not exclusively (see 2.2.3), understood as "wet EGCS".

2.2.3 In the absence of specific guidelines for EGCSs which use technologies or operate in modes that are not defined in 2.3, these Guidelines may also be applied as appropriate.

2.2.4 These Guidelines apply to:

.1 EGCSs installed on ships the keels of which are laid or which are at a similar stage of construction on or after 1 June 2022; or

.2 EGCSs installed on ships the keels of which are laid or which are at a similar stage of construction before 1 June 2022 which have a contractual delivery date of EGCS to the ship on or after 1 June 2022 or, in the absence of a contractual delivery date, the actual delivery of the EGCS to the ship on or after 1 June 2022; or

.3 amendments as those specified in 4.2.2.4 or 5.6.3 to existing EGCSs undertaken on or after 1 June 2022.

2.3 Abbreviations, definitions and required documents

2.3.1 Abbreviations as given in table 2 and definitions as given in table 3 are applied in these Guidelines.

Table 2: Abbreviations

CL	Closed-Loop
CO_2	Carbon dioxide
EGC	Exhaust gas cleaning
EGCS	Exhaust gas cleaning system
ETM-A	EGCS – Technical Manual for Scheme A
ETM-B	EGCS – Technical Manual for Scheme B
MCR	Maximum Continuous Rating
SECP	SO_X Emissions Compliance Plan
SECC	SO_X Emissions Compliance Certificate
SO_2	Sulphur dioxide
SO_X	Sulphur oxides
OL	Open-Loop
OMM	Onboard Monitoring Manual
PAH	Polycyclic Aromatic Hydrocarbons
PAH_{phe}	Polycyclic Aromatic Hydrocarbons as phenanthrene equivalents (see table 3)
UTC	Universal Time Coordinated

Table 3: Definitions

12-hour period	A period of 12 consecutive hours determined on a rolling basis with new 12-hour periods beginning past each hour of EGCS operation.
Bleed-off water	An amount of aqueous solution removed from the washwater of an EGCS operating in closed-loop mode to keep its required operating properties and efficiency.
Certified Value	The Emission Ratio specified by the manufacturer that the EGCS is certified as meeting when operating on a continuous basis on the manufacturer-specified maximum fuel sulphur content and within the specified operational parameters. Applicable to Scheme A only.
Closed-loop mode	EGCS operating mode in which the washwater is passed several times through the EGC unit.

	In order for the washwater to keep its required operating properties and efficiency, its pH usually has to be adjusted, e.g. by adding chemicals such as NaOH. In addition, a small amount of washwater is bled, periodically or continuously, from the system. This bleed-off water, unless meeting discharge water criteria, needs to be treated to meet discharge water criteria, or is regarded as EGCS residue.
Continuous monitoring	Process and technology used for evaluation of EGCS compliance through representative measurement, at a specified frequency, for selected parameters.
Discharge water	Any water from an EGCS to be discharged overboard.
EGC unit	Device within which exhaust gas and cleaning medium are mixed. An EGC unit may have a single or multiple fuel oil combustion unit(s) connected to it.
EGCS Electronic Data Recording, or Electronic Logging System	Automatic record of the EGCS in service operating parameters. The record of parameters does not involve any user input.
EGCS Record Book (or Electronic Record Book)	A user-input record of the EGCS, component adjustments, corrective and planned maintenance and service records as appropriate. It can have an electronic format.
EGCS residue	Material removed from the washwater or the bleed-off water by a treatment system or discharge water that does not meet the discharge criterion, or other residue material removed from the EGCS.
Emission Ratio	SO_2 expressed in ppm/CO_2 expressed in % v/v.
Exhaust Gas Cleaning System (EGCS)	A system that includes one or more EGC units and which is based on technology that uses a wet cleaning medium for the reduction of SO_X from an exhaust gas stream from installed fuel oil combustion unit(s), operating in either open-loop or closed-loop mode. A hybrid EGCS can operate in both open-loop mode and closed-loop mode. Several EGC units may utilize a common uptake system with a single exhaust gas monitoring system. Several EGC units may utilize a common washwater, water supply, treatment and/or overboard system and discharge water monitoring equipment.
Extractive sampling system	System which extracts a sample flow from the exhaust gas stream and transfers it by heated lines to the measurement instrument.
Fuel oil combustion unit	Any engine, boiler, gas turbine, or other fuel oil fired equipment, excluding shipboard incinerators.
Inlet water	Water entering the ship as a cleaning medium for an EGC unit.
In situ	Measuring directly within an exhaust gas stream.

Load range	Interval ranging from minimum practicable to maximum rated power of diesel engine or maximum steaming rate of the boiler.
Open-loop mode	EGCS operating mode in which the washwater, typically seawater, is passed through the EGC unit only once before it is being discharged overboard as discharge water.
Phenanthrene equivalent	It corresponds to the signal produced by a PAH monitor with excitation wavelengths between 244 nm and 264 nm (254±10 nm) and detection wavelengths between 310 nm and 410 nm (360±50 nm) calibrated against a known set of phenanthrene concentrations within the expected measurement range when exposed to EGCS discharge water containing a range of different PAH species.
Washwater	Cleaning medium brought into contact with the exhaust gas stream for the reduction of SO_X.
Wet EGCS	EGCS using liquid cleaning medium.

2.3.2 Relevant documents for EGCSs approved in accordance with Scheme A and Scheme B are listed in table 4.

Table 4: Relevant documents for Scheme A and Scheme B

Document	Scheme A	Scheme B
SECP	X	X
SECC	X	
ETM Scheme A	X	
ETM Scheme B		X
OMM	X	X
EGCS Record Book or Electronic Record Book	X	X

3 SAFETY NOTE

3.1 Due attention is to be given to the safety implications related to the handling and proximity of exhaust gases, the measurement equipment and the storage and use of pressurized containers of pure and calibration gases. Sampling positions and permanent access platforms should be such that this monitoring may be performed safely. For positioning the EGCS discharge water outlet, due consideration should be given to the locations of the existing seawater inlets. In all operating conditions the design of the EGCS should take into consideration the necessary balance between low pH water discharge and the anti-corrosive resistance of the surfaces in contact with that discharge stream. To avoid premature failure of sea chests, discharge pipework and hull penetration finishes, due care should be taken in the preparation of surfaces and the correct selection and application of protective coatings to withstand the corrosive effects of low pH discharge water.

3.2 In cases where exhaust gas duct bypass lines are arranged on board, appropriate measures should be taken to prevent leakage of exhaust gases from the damper to bypass lines.

4 SCHEME A – EGCS APPROVAL, SURVEY AND CERTIFICATION USING PARAMETER AND EMISSION CHECKS

4.1 Approval of EGCSs

4.1.1 General

Options under Scheme A of these Guidelines provide for:

.1 individual EGCS approval;

.2 serially manufactured systems; and

.3 production range approval.

4.1.2 Individual EGCS approval

4.1.2.1 An EGCS should be certified as capable of meeting the Emission Ratio value, the Certified Value, specified by the manufacturer (e.g. the Emission Ratio value the system is capable of achieving on a continuous basis) with fuel oils of the manufacturer's specified maximum % m/m sulphur content and for the range of operating parameters, as listed in 4.2.2.1.2, for which they are to be approved. The Certified Value should at least be suitable for ship operations under requirements given by MARPOL Annex VI regulations 14.1 and/or 14.4.

4.1.2.2 Where testing is not to be undertaken with fuel oils of the manufacturer's specified maximum % m/m sulphur content, the use of two test fuels with a lower % m/m sulphur content is allowed. The two fuels selected should have a difference in % m/m sulphur content sufficient to demonstrate the operational behaviour of the EGCS and to demonstrate that the Certified Value can be met if the EGCS were to be operated with a fuel of the manufacturer's specified maximum % m/m sulphur content. In such cases a minimum of two tests, in accordance with subsection 4.3 as appropriate, should be performed. These tests need not be sequential and could be undertaken on two different, but identical, EGCSs.

4.1.2.3 The maximum and, if applicable, minimum exhaust gas mass flow rate of the system should be stated. The effect of variation of the other parameters defined in 4.2.2.1.2 should be justified by the equipment manufacturer. The effect of variations in these factors should be assessed by testing or otherwise as appropriate. No variation in these factors, or combination of variations in these factors, should be such that the emission value of the EGCS would be in excess of the Certified Value.

4.1.2.4 Data obtained in accordance with this section should be submitted to the Administration for approval together with the ETM-A.

4.1.3 Serially manufactured systems

4.1.3.1 In the case of nominally similar EGCSs of the same mass flow ratings as that certified under 4.1.2, and to avoid the testing of each EGCS, the Administration, based on a submission of the equipment manufacturer, should take the necessary measures to verify that adequate arrangements have been made to ensure effective control of the conformity of production arrangement. The certification of each EGCS under this arrangement should be subject to such surveys that the Administration should consider necessary as to assure that each EGCS has an Emission Ratio value of not more than the Certified Value when operated in accordance with the parameters defined in 4.2.2.1.2.

4.1.4 Product range approval

4.1.4.1 In the case of an EGCS of the same design, but of different maximum exhaust gas mass flow capacities, the Administration may accept, in lieu of tests on an EGCS of all capacities in accordance with 4.1.2, tests of EGCSs of three different capacities provided that the three tests are performed at intervals including the highest, lowest and one intermediate capacity rating within the range.

4.1.4.2 Where there are significant differences in the design of EGCSs of different capacities, this procedure should not be applied unless it can be shown, to the satisfaction of the Administration, that in practice those differences do not materially alter the performance between the various EGCS types.

4.1.4.3 For EGCSs of different capacities, the sensitivity to variations in the type of combustion machinery to which they are fitted should be detailed together with sensitivity to the variations in the parameters listed in 4.2.2.1.2. This should be on the basis of testing, or other data as appropriate.

4.1.4.4 The effect of changes of EGCS capacity on washwater and discharge water characteristics should be detailed.

4.1.4.5 All supporting data obtained in accordance with this section, together with the ETM-A for each system, should be submitted to the Administration for approval.

4.2 Survey and certification

4.2.1 Procedures for the certification of an EGCS

4.2.1.1 In order to meet the criterion of subsection 4.1 either prior to, or after installation on board, each EGCS should be certified as meeting the Certified Value specified by the manufacturer (e.g. the Emission Ratio the system is capable of achieving on a continuous basis) under the operating conditions and restrictions as given by the EGCS Technical Manual (ETM-A) as approved by the Administration.

4.2.1.2 Determination of the Certified Value should take into account the provisions of these Guidelines.

4.2.1.3 Each EGCS meeting the criterion of 4.2.1.1 should be issued an SECC by the Administration. The form of the SECC is given in appendix 1.

4.2.1.4 Application for an SECC should be made by the EGCS manufacturer, shipowner or other party.

4.2.1.5 Any subsequent EGCS of the same design and rating as that certified under 4.2.1.1 may be issued with an SECC by the Administration without the need for testing taking into account 4.2.1.1 subject to 4.1.3 of these Guidelines.

4.2.1.6 EGCSs of the same design, but with ratings different from that certified under 4.2.1.1 may be accepted by the Administration subject to 4.1.4 of these Guidelines.

4.2.1.7 EGCSs which treat only part of the exhaust gas flow of the uptake in which they are fitted should be subject to special consideration by the Administration to ensure that under all defined operating conditions the overall Emission Ratio value of the exhaust gas downstream of the system is no more than the Certified Value.

4.2.2 EGCS Technical Manual "Scheme A" (ETM-A)

4.2.2.1 Each EGCS should be supplied with an ETM-A provided by the manufacturer. This ETM-A should, as a minimum, contain the following information:

.1 the identification of the system (manufacturer, model/type, serial number and other details as necessary) including a description of the system and any required ancillary systems. In case a system contains more than one EGC unit, each EGC unit should be identified;

.2 the operating limits, or range of operating values, for which the unit is certified. These should, as a minimum, include:

.1 the maximum and, if applicable, minimum mass flow rate of exhaust gas;

.2 the maximum and, if applicable, minimum exhaust gas mass flow rate capacity of the EGC unit;

.3 the maximum fuel oil sulphur content the EGCS is certified for;

.4 the Certified Value;

.5 the power, type and other relevant parameters of the fuel oil combustion unit which the EGCS is to be connected to; for boilers also the maximum air/fuel ratio at 100% load should be given; and for diesel engines whether the engine is of 2 or 4-stroke cycle should be indicated;

.6 the maximum and minimum washwater flow rate, inlet pressures and minimum inlet water alkalinity (ISO 9963-1-2:1994);

.7 the exhaust gas inlet temperature ranges and maximum and minimum exhaust gas outlet temperature with the EGCS in operation;

.8 the maximum exhaust gas differential pressure across the EGC unit and the maximum exhaust gas inlet pressure;

.9 the salinity levels or fresh water elements necessary to provide adequate neutralizing agents; and

.10 other factors concerning the design and operation of the EGCS relevant to achieving a maximum Emission Ratio value no higher than the Certified Value;

.3 any requirements or restrictions applicable to the EGCS or associated equipment necessary to enable the system to achieve a maximum Emission Ratio value no higher than the Certified Value;

.4 maintenance, service or adjustment requirements in order that the EGCS can continue to achieve a maximum Emission Ratio value no higher than the Certified Value. The maintenance, servicing and adjustments should be recorded in the EGCS Record Book;

.5 corrective actions to be applied if the following occurs or is expected to occur: operating conditions are outside approved ranges or limits; the discharge water quality criteria are not met; or exceedances of the Certified Value;

.6 a verification procedure to be used during surveys to ensure that the system's performance is maintained and that the system is used as required (see subsection 4.4);

.7 washwater and discharge water characteristics across the operating load range;

.8 design requirements for the treatment and monitoring of washwater and control of discharge water, including, for example, bleed-off water from closed-loop EGCS operation or discharge water temporarily stored within the EGCS; and

.9 detail the procedure to produce reports regarding operation in a non-compliant condition, or in a condition where the ongoing compliance would be temporary indicated in accordance with 8.2.8.

4.2.2.2 The ETM-A should be approved by the Administration.

4.2.2.3 The ETM-A should be retained on board the ship onto which the EGCS is installed and should be available for surveys as required.

4.2.2.4 Amendments to the ETM-A which reflect EGCS changes that affect performance with respect to emissions to air and/or water should be approved by the Administration. Where additions, deletions or amendments to the ETM-A are separate to the ETM-A as initially approved, they should be retained with the ETM-A and should be considered as part of it.

4.2.3 In-service surveys

4.2.3.1 The EGCS should be subject to survey on installation and at initial, annual/intermediate and renewals surveys by the Administration.

4.2.3.2 In accordance with regulation 10 of MARPOL Annex VI, the EGCS may also be subject to inspection by port State control.

4.2.3.3 Prior to use, each EGCS should be issued with an SECC by the Administration.

4.2.3.4 Following the installation survey given in 4.2.3.1, sections 2.3 and 2.6 of the Supplement to the ship's International Air Pollution Prevention Certificate should be duly completed.

4.3 Emission limits

4.3.1 Each EGCS should be capable of reducing emissions to equal to or less than the Certified Value at any load point, including fuel oil combustion unit idling, when operated in accordance with 4.2.2.1.2.

4.3.2 In order to demonstrate performance, emission measurements should be undertaken, with the agreement of the Administration, at a minimum of four load points. One load point should be at 95% to 100% of the maximum exhaust gas mass flow rate for which the unit is to be certified. One load point should be within ± 5% of the minimum exhaust gas mass flow rate

for which the unit is to be certified. The other two load points should be equally spaced between the maximum and minimum exhaust gas mass flow rates. Where there are discontinuities in the operation of the system, the number of load points should be increased, with the agreement of the Administration, so that it is demonstrated that the required performance over the stated exhaust gas mass flow rate range is retained. Additional intermediate load points should be tested if there is evidence of an emission peak below the maximum exhaust gas mass flow rate and above, if applicable, the minimum exhaust gas flow rate. These additional tests should be of sufficient number as to establish the emission peak value.

4.4 Onboard verification procedures for demonstrating compliance

4.4.1 For each EGCS, the ETM-A should contain a verification procedure for use during surveys as required. This procedure should not require specialized equipment or an in-depth knowledge of the system. Where particular devices are required, they should be provided and maintained as part of the system. The EGCS should be designed in such a way as to facilitate inspection as required. The basis of the verification procedure is that if all relevant components and operating values or settings are within the approved ranges, then the performance of the EGCS can be assumed to meet the requirements without the need for actual continuous exhaust emission monitoring.

4.4.2 Included in the verification procedure should be all components and operating values or settings which may affect the operation of the EGCS and its ability to meet the Certified Value.

4.4.3 The verification procedure should be provided by the EGCS manufacturer and approved by the Administration.

4.4.4 The verification procedure should cover both a documentation check and a physical check of the EGCS.

4.4.5 The surveyor should verify that each EGCS is installed in accordance with the ETM-A and has an SECC as required.

4.4.6 At the discretion of the Administration, the surveyor should have the option of checking one or all of the identified components, operating values or settings. Where there is more than one EGC unit within the EGCS, the Administration may, at its discretion, abbreviate or reduce the extent of the survey on board; however, the entire survey should be completed for at least one of each type of EGC unit on board provided that it is expected that the other EGC units perform in the same manner.

4.4.7 The EGCS should include means to automatically record when the system is in use. These means should automatically record, at least at the frequency specified in 5.4.2, as a minimum, washwater pressure and flow rate at the EGC unit's inlet connection, exhaust gas pressure before and pressure drop across each EGC unit, fuel oil combustion unit load, and exhaust gas temperature before and after the EGC unit against the respective operating limits, or range of operating values. The data recording system should comply with the requirements of sections 7 and 8. In the case of a system consuming chemicals at a known rate as documented in ETM-A, recordings of such consumption in the EGCS Record Book also serves this purpose.

4.4.8 Under Scheme A, if a continuous exhaust gas monitoring system is not fitted, a daily spot check of the Emission Ratio for a duration of not less than five minutes at a minimum recording frequency of 0.1 Hz at normal working condition for each outlet to the atmosphere should be undertaken to verify compliance in conjunction with the continuous monitoring of the parameters stipulated in 4.4.7. The exhaust gas readings should be allowed to stabilize before

commencing recording. Readings from the calibration procedure should be automatically recorded or noted in a calibration protocol. Emission values, which are used to determine the Emission Ratio, obtained after stabilization should be recorded. If a continuous exhaust gas monitoring system is fitted, only daily spot checks of the parameters listed in paragraph 4.4.7 would be needed to verify proper operation of the EGC unit.

4.4.9 An EGCS Record Book should be maintained on board the ship recording maintenance and service of the system including like-for-like replacement. This EGCS Record Book should be available during surveys as required and may be read in conjunction with engine-room logbooks and other data, as necessary, to confirm the correct operation of the EGCS. The form of this record should be provided by the EGCS manufacturer and approved by the Administration. Alternatively, this information may be recorded in the ship's planned maintenance record system as approved by the Administration. Alternatively, this information may be recorded in an Electronic Record Book as approved by the Administration. The EGCS Record Book entries should be maintained on board the ship for a minimum period of three years after the last entry has been made.

5 SCHEME B – EGCS APPROVAL, SURVEY AND CERTIFICATION USING CONTINUOUS MONITORING OF EMISSION RATIO

5.1 General

5.1.1 Scheme B provides for the approval of the means of continuous Emission Ratio monitoring, supported by daily parameter checks, which will subsequently be used at surveys, and otherwise as required, to demonstrate compliance with the objectives as given in the SECP.

5.2 Approval

5.2.1 The ETM-B, as defined in these Guidelines, should be approved by the Administration.

5.3 Survey and certification

5.3.1 The EGCS's exhaust gas monitoring system should be subject to survey on installation and at initial, annual/intermediate and renewals surveys by the Administration in order to demonstrate that it functions as given in the OMM. The scope of the installation or initial survey should include EGCS operation, as required, in order to demonstrate the functionality of the exhaust gas monitoring system.

5.3.2 Following the installation survey given in 5.3.1 and approval of documents as listed in 2.3.2, sections 2.3 and 2.6 of the Supplement to the ship's International Air Pollution Prevention Certificate should be duly completed.

5.4 Exhaust gas monitoring

5.4.1 The exhaust gas composition of the Emission Ratio should be measured at an appropriate position after the EGC unit and that measurement should be as given in section 6 as applicable. A suitable position could be downstream of the EGC unit, but before any possible mixing of outside ambient air or other additional air or gases with the exhaust gas.

5.4.2 SO_2(ppm) and CO_2(%) and, to not less than one decimal place, the Emission Ratio should be continuously monitored and recorded against the applicable Emission Ratio limit onto a data recording and processing device at a rate which should not be less than 0.0035 Hz

whenever the EGCS is in operation. This monitoring may be suspended for service and maintenance periods of gas analyser and associated equipment as required by the OMM. Zero and span check calibration and instrument drift data should, as given in the OMM, be either recorded by the data recording system or manually entered in the EGCS Record Book as appropriate to the means used.

5.4.3 If more than one analyser is to be used to determine the Emission Ratio, these should have similar sampling and measurement times and the data outputs aligned to ensure that the Emission Ratio is fully representative of the exhaust gas composition.

5.5 Onboard verification procedures for demonstrating compliance with emission limits

5.5.1 The data recording system should be as given in sections 7 and 8. Data and the associated reports should be available to the Administration as necessary to demonstrate compliance as required and, in accordance with regulation 10 of MARPOL Annex VI, may also be subject to inspection by port State control.

5.5.2 Daily spot checks of the parameters listed in 4.4.7 are needed to verify proper operation of the EGCS and should be recorded in the EGCS Record Book or in the engine-room logger system.

5.6 EGCS Technical Manual "Scheme B" (ETM-B)

5.6.1 Each EGCS should be supplied with an ETM-B provided by the manufacturer. This ETM-B should, as a minimum, contain the following information:

.1 the identification of the system (manufacturer, model/type, serial number and other details as necessary) including a description of the system and any required ancillary systems. If a system consists of more than one EGC unit, each EGC unit should be identified;

.2 the operating limits, or range of operating values, for which the system is designed. These should, as a minimum, include:

.1 the maximum and, if applicable, minimum mass flow rate of exhaust gas;

.2 the advised maximum fuel sulphur content for the operational conditions the EGCS is designed for (Note: higher sulphur content fuel oils may be used provided the relevant Emission Ratio value is not exceeded);

.3 the power, type and other relevant parameters of the fuel oil combustion unit for which the EGCS is to be connected to. For boilers, the maximum air/fuel ratio at 100% load should also be given for diesel engines whether the engine is of 2 or 4-stroke cycle;

.4 the maximum and minimum washwater flow rate, inlet pressures and minimum inlet water alkalinity (ISO 9963-1-2:1994);

.5 the exhaust gas inlet temperature ranges and maximum and minimum exhaust gas outlet temperature with the EGCS in operation;

.6 the maximum exhaust gas differential pressure across the EGC unit and the maximum exhaust gas inlet pressure;

.7 the salinity levels or fresh water elements necessary to provide adequate neutralizing agents; and

.8 other parameters as necessary concerning the operation of the EGCS;

.3 any requirements or restrictions applicable to the EGCS or associated equipment;

.4 corrective actions to be applied if the following occurs or is expected to occur: operating conditions are outside approved ranges or limits; the discharge water quality criteria are not met; or exceedances of the maximum allowable Emission Ratio;

.5 washwater and discharge water characteristics across the operating load range;

.6 design requirements for the treatment and monitoring of washwater and control of discharge water, including for example bleed-off water from closed-loop EGCS operation or discharge water temporarily stored within the EGCS; and

.7 detail the procedure for producing reports regarding operation in a non-compliant condition, or in a condition where the ongoing compliance would be temporary indicated in accordance with 8.2.8.

5.6.2 The ETM-B should be retained on board the ship onto which the EGCS is fitted. The ETM-B should be available for surveys as required.

5.6.3 Amendments to the ETM-B which reflect EGCS changes that affect performance with respect to emissions to air and/or water should be approved by the Administration. Where additions, deletions or amendments to the ETM-B are separate from the ETM-B as initially approved, they should be retained with the ETM-B and should be considered as part of it.

5.7 Onboard procedures for demonstrating compliance

5.7.1 An EGCS Record Book should be maintained on board the ship recording maintenance and servicing of the emission monitoring and ancillary components as given in the OMM including like-for-like replacements. The form of this record book should be approved by the Administration. This EGCS Record Book should be available at surveys as required and may be read in conjunction with engine-room logbooks and other data as necessary to confirm the correct operation of the EGCS. Alternatively, this information may be recorded in the ship's planned maintenance record system as approved by the Administration. Alternatively, this information may be recorded in an Electronic Record Book as approved by the Administration. The EGCS Record Book entries should be maintained on board the ship for a minimum period of three years after the last entry has been made.

6 EMISSION TESTING

6.1 Emission testing should follow the requirements of the NO_X Technical Code 2008 except as provided for in these Guidelines.

6.2 CO_2 should be measured using an analyser operating on the non-dispersive infrared (NDIR) principle and with additional equipment such as dryers as necessary. SO_2 should be measured using analysers operating on NDIR or non-dispersive ultra-violet (NDUV) principles and with additional equipment such as dryers as necessary. Other systems or analyser principles may be accepted, subject to the approval of the Administration, provided they yield equivalent or better results than those of the equipment referenced above. For acceptance of other CO_2 systems or analyser principles, the reference method should be in accordance with the requirements of appendix III of the NO_X Technical Code 2008.

6.3 The analysing equipment should be installed, operated, maintained, serviced and calibrated in accordance with the requirements as given in the OMM, at a frequency which ensures that the requirements of 1.7 to 1.10 of appendix III of the NO_X Technical Code 2008 are met at all times the equipment is in operation.

6.4 An exhaust gas sample for SO_2 should be obtained from a representative sampling point downstream of the EGC unit.

6.5 SO_2 and CO_2 should be monitored using either in situ or extractive sampling systems.

6.6 Extractive exhaust gas samples for SO_2 determination should be maintained at a sufficient temperature to avoid condensation of water in the sampling system and hence loss of SO_2.

6.7 If an extractive exhaust gas sample for determination needs to be dried prior to analysis it should be done in a manner that does not result in loss of SO_2 in the sample as analysed.

6.8 The SO_2 and CO_2 values should be compared on the basis of the same residual water content (e.g. dry or with the same wetness fraction).

6.9 In justified cases where the CO_2 concentration is reduced by the EGC unit, the CO_2 concentration can be measured at the EGC unit inlet, provided that the correctness of such a methodology can be clearly demonstrated. In such cases the SO_2 and CO_2 values should be compared on a dry basis. If measured on a wet basis the water content in the exhaust gas stream at those points should also be determined in order to correct the readings to dry basis values. For calculation of the CO_2 value on a dry basis, the dry/wet correction factor may be calculated in accordance with paragraph 5.12.3.2.2 of the NO_X Technical Code 2008.

6.10 Extractive sample systems should be verified to be free of ingress leakage in accordance with the analysing equipment manufacturers' recommendations at intervals as defined in the OMM. It should be verified that the system is free of ingress on initial start-up and as given in the OMM with the findings from those checks recorded in the EGCS Record Book.

6.11 The span gases for the SO_2 and CO_2 analyser should be a mixture of SO_2 and/or CO_2 and nitrogen at a concentration of more than 80% of the full scale of the measuring range used. The span gas for the CO_2 should conform to the requirements of section 2 of appendix IV of the NO_X Technical Code 2008. Other equivalent arrangements, as detailed in the OMM, may be accepted by the Administration.

7 DATA RECORDING AND PROCESSING DEVICE

7.1 The recording and processing device should be of robust, tamper-proof design with read-only capability.

7.2 The recording and processing device should record, whenever the EGCS is in operation, the data described in 4.4.7, 5.4.2, and 10.3 as applicable, including overboard discharges from any associated tanks within the system, against UTC and ship's position as given by a Global Navigational Satellite System (GNSS) and whether the ship was inside or outside an Emission Control Area as given by regulation 14.3 at that time. The device should also be capable of:

.1 (Scheme B only) being automatically set, or pre-set, with the Emission Ratio limit value as appropriate to the sea area, in relation to regulation 14.3, where the ship is operating;

.2 being automatically set, or pre-set, with the applicable overboard pH limit value;

.3 being automatically set with the applicable PAH limit value;

.4 recording the aggregated time in excess of 15 minutes over any rolling 12-hour period that the differential PAH value is above the set limit value by more than 100%;

.5 being pre-set with the applicable turbidity limit value;

.6 recording the aggregated time in excess of 15 minutes over any rolling 12-hour period that the rolling average differential turbidity value is above the set limit value by more than 20%; and

.7 recording preset and set limit values.

7.3 The recording and processing device should be capable of preparing reports over specified time periods.

7.4 Data should be retained for a period of not less than 18 months from the date of recording. If the device is changed over that period, it should be ensured that the required data is retained on board and available as required for inspection.

7.5 The device should be capable of downloading a copy of the recorded data and reports in a readily useable format clearly indicating periods of non-compliance. Such copy of the data and reports should be available to the Administration or port State control as requested.

8 ONBOARD MONITORING MANUAL (OMM)

8.1 An OMM should be prepared to cover each EGCS installed in conjunction with a fuel oil combustion unit, which should be identified, for which compliance is to be demonstrated.

8.2 The OMM should, as a minimum, include:

.1 for extractive exhaust gas sampling systems, the position from which the gas sample is drawn together with details, arrangement and operating ranges of the analysers and all necessary ancillary components or requirements including, but not limited to, sample probe assembly, sample transfer line and sample treatment unit;

.2 for in situ exhaust gas analysers, the location and arrangement of the analyser in the exhaust duct, operating ranges and all necessary ancillary components or requirements;

.3 for inlet water and discharge water monitoring, the positions from which the water samples are drawn, the location and arrangement of the analysers together with details of any necessary ancillary services such as sample transfer lines and sample treatment units;

.4 the analysers to be used for monitoring of exhaust gas, inlet water, discharge water, their service, maintenance, and calibration requirements. Templates covering the minimum information which should be included are provided in appendix 5;

.5 the zero and span check procedures of the exhaust gas analysers and calibration of washwater, discharge water and inlet water analysers together with reference materials to be used and the required frequency of those checks;

.6 the operating parameter instruments to be used described in 4.4.7 or 5.5.2;

.7 the installation, operation, adjustment, maintenance, servicing and calibration requirements and procedures of the analysers, associated ancillary equipment and operating parameter measurement instruments;

.8 the means by which ongoing compliance would be temporarily indicated in the case of the failure of a single monitoring device, taking into account that transitory periods of emission exceedances and/or isolated spikes in the recorded output in the Emissions Ratio do not necessarily mean non-compliant exceedance of emissions and should therefore not be considered as a breach of the requirements;

.9 the data recording system and how it is to be operated, data retained and the types of reports which it can produce;

.10 guidance as to data or other indications which may signify a malfunction of either an analyser, an item of ancillary equipment or an operating parameter sensor together with the fault-finding and corrective actions which should be taken;

.11 other information or data relevant to the correct functioning or use of the monitoring system or its use in demonstrating compliance; and

.12 where the information described in .1 to .11 above is referring to detailed descriptions of procedures, reference can be made to additional documents (e.g. manufacturer's documentation) which should be considered part of the OMM.

8.3 The OMM should specify how the EGCS, operating parameter measurement instruments and the exhaust gas and discharge water monitoring systems are to be surveyed in order to verify that:

.1 the EGCS conforms to the ETM-A or ETM-B as applicable;

.2 the operating parameter instruments installed and used on board are as approved per the OMM;

.3 the exhaust gas and discharge water monitoring systems used on board are as approved per the OMM;

.4 inspection, maintenance, servicing, calibration and adjustments have been undertaken as required and those actions recorded in the EGCS Record Book as required; and

.5 the operating parameter instruments and the exhaust gas and discharge water monitoring systems are correctly functioning.

8.4 Under scheme B, where operation of the EGCS is required in order to demonstrate the functionality of the monitoring system during installation or initial surveys, the OMM should describe the operational condition(s) which demonstrate the operational behaviour of the monitoring system and which should be used when surveying in accordance with paragraph 5.3.1. The description of operational condition(s) may include:

.1 the connected fuel oil combustion unit load point(s); and

.2 the minimum operating time at a given load point.

8.5 The OMM should be:

.1 approved by the Administration; and

.2 retained on board the ship onto which the EGCS is installed and should be available for surveys as required.

9 SHIP COMPLIANCE

9.1 SO_X Emissions Compliance Plan (SECP)

9.1.1 For a ship which is to use an EGCS, in part or in total, as an approved equivalent means to the requirements given by regulation 14.1 or 14.4 of MARPOL Annex VI there should be an SECP for the ship, approved by the Administration.

9.1.2 The SECP should list each fuel oil combustion unit which may use fuel oil supplied in accordance with the requirements of regulations 14.1 and/or 14.4 of MARPOL Annex VI.

9.1.3 The SECP should list each fuel oil combustion unit which may use Scheme A and/or B of these Guidelines together with identification of the EGCS to which it is connected and whether this control may be applied continuously or only inside or only outside the Emission Control Areas given by regulation 14.3 of MARPOL Annex VI.

9.1.4 The SECP should advise that records should be kept of actions initiated to meet the requirement of these Guidelines in case of breakdown of the EGCS or associated equipment, and that the relevant flag and port State's Administration should be notified, in accordance with MEPC.1/Circ.883/Rev.1.

9.2 Demonstration of compliance

9.2.1 Scheme A

9.2.1.1 The SECP should refer to, not reproduce, the ETM-A, EGCS Record Book or engine-room logger system and OMM as specified under Scheme A.

9.2.1.2 For all fuel oil combustion units listed under 9.1.3, details should be provided demonstrating that the rating and restrictions for the EGCS as approved, under 4.2.2.1.2, are complied with.

9.2.1.3 Required parameters should be monitored and recorded as described in 4.4.7 when the EGCS is in operation in order to demonstrate compliance.

9.2.2 Scheme B

9.2.2.1 The SECP should refer to, not reproduce, the ETM-B, EGCS Record Book or engine-room logger system and OMM as specified under Scheme B.

10 DISCHARGE WATER

10.1 Discharge water quality criteria[1]

10.1.1 EGCS discharge water should comply with the following criteria prior to being discharged into the sea:

10.1.2 pH criteria

10.1.2.1 The discharge water pH should comply with one of the following requirements, which should be recorded in the ETM-A or ETM-B as applicable:

.1 The discharge water should have a pH no lower than 6.5 measured at the ship's overboard discharge with the exception that, during manoeuvring and transit, a maximum difference of 2 pH units is allowed between the inlet water and overboard discharge values.

.2 The pH discharge limit, at the overboard monitoring position, is the value that will ensure a pH no lower than 6.5 at a distance of 4 m from the overboard discharge point with the ship stationary, and is to be recorded as the overboard pH discharge limit in the ETM-A or ETM-B. The overboard pH discharge limit can be determined either by means of direct measurement, or by using a calculation-based methodology (computational fluid dynamics or other equally scientifically established empirical formulae) as agreed by the Administration, and in accordance with the following conditions to be recorded in the ETM-A or ETM-B:

[1] The discharge water quality criteria should be reviewed in the future as more data become available, including relevant research and development results, on the content of discharge water and its effects, taking into consideration any advice given by GESAMP. Guidance for voluntary discharge water data collection is included in appendix 3.

.1 all EGC units connected to the same outlets are operating at their full loads (or highest practicable load) and with fuel oil of the maximum sulphur content for which the units are to be certified (Scheme A) or used with (Scheme B);

.2 if a test fuel with lower sulphur content, and/or test load lower than maximum, sufficient for demonstrating the behaviour of the discharge water plume is used, the plume's mixing ratio must be established based on the titration curve of seawater. The mixing ratio would be used to demonstrate the behaviour of the discharge water plume and that the overboard pH discharge limit has been met if the EGCS is operated at the highest fuel sulphur content and load for which the EGCS is certified (Scheme A) or used with (Scheme B);

.3 where the discharge water flow rate is varied in accordance with the EGCS gas flow rate, the implications of this for the part load performance should also be evaluated to ensure that the overboard pH discharge limit is met under any load;

.4 reference should be made to a seawater alkalinity of 2.2 mmol/L and pH 8.2;[2] an amended titration curve should be applied where the testing conditions differ from the reference seawater, as agreed by the Administration (example titration curve for reference seawater conditions is presented in appendix 4); and

.5 if a calculation-based methodology is to be used, details should be submitted to allow its verification such as but not limited to supporting scientific formulae, discharge point specification, discharge water flow rates, designated pH values at both the discharge and 4 m location, titration and dilution data.

10.1.3 PAHs (Polycyclic Aromatic Hydrocarbons)

10.1.3.1 The discharge water PAH should meet the criteria below. The appropriate limit should be specified in the ETM-A or ETM-B.

10.1.3.2 The maximum continuous PAH concentration in the discharge water should not be greater than 50 µg/L PAH_{phe} (phenanthrene equivalent) above the inlet water PAH concentration. For the purposes of this criterion, the PAH concentration in the discharge water should be measured downstream of the water treatment equipment including any reactant dosing unit, if used, but upstream of any dilution for control of pH, if used, prior to discharge.

10.1.3.3 The 50 µg/L limit described above is normalized for a discharge flow rate, before any dilution for pH control, of 45 t/MWh where the MW refers to the aggregated MCR of all those fuel oil combustion units whose EGCS discharge water PAH is being monitored at that point. In cases where sensors are installed in a separate measurement cell, the PAH limit applies to the flow in the main discharge pipe from which the water is bypassed. This limit would have to be adjusted upward for lower washwater flow rates (t/h) per MW, and vice versa, according to the table below.

[2] These values could be revised within two years for new installations following the adoption of these amended Guidelines upon further inputs on the physical state of the seas resulting from the use of exhaust gas cleaning systems.

Table 5: Criteria for discharge water PAH concentration

Specific Discharge Water flow rate (before dilution for pH control) (t/MWh)	Discharge concentration limit (µg/L PAH_{phe} equivalents)	Measurement technology
0-1	2250	Ultraviolet light*
2.5	900	– " –*
5	450	Fluorescence[3]
11.25	200	– " –
22.5	100	– " –
45	50	– " –
90	25	– " –

*Alternative measurement technologies may be used with the agreement of the Administration.

10.1.3.4 For an aggregated 15-minute period in any rolling 12-hour period, the continuous PAH_{phe} concentration limit may exceed the limit described above by up to 100%. This would allow for an abnormal start-up of the EGC unit.

10.1.4 Turbidity/Suspended particulate matter

10.1.4.1 The discharge water treatment system should be designed to minimize suspended particulate matter, including heavy metals and ash. The turbidity of the discharge water, following treatment equipment, including any reactant dosing, but upstream of any other dilution unit, if used, should meet the criteria below. The limit should be recorded in the ETM-A or ETM-B.

10.1.4.2 The maximum continuous turbidity in the discharge water should not be greater than 25 FNU (formazin nephlometric units) or 25 NTU (nephlometric turbidity units) or equivalent units, above the inlet water turbidity. However, during periods of high inlet turbidity, the precision of the measurement device and the time lapse between inlet measurement and outlet measurement are such that the use of a difference limit is unreliable. Therefore, all turbidity difference readings should be a rolling average over a maximum 15-minute period to a maximum of 25 FNU or NTU.

10.1.4.3 For an aggregated 15-minute period in any rolling 12-hour period, the continuous turbidity discharge limit may be exceeded by 20%.

10.1.5 Nitrates

10.1.5.1 The discharge water treatment system should prevent the discharge of nitrates beyond that associated with a 12% removal of NO_X from the exhaust, or beyond 60 mg/l normalized for discharge water flow rate of 45 t/MWh, whichever is the greater, where the MW refers to the MCR or 80% of the power rating of the fuel oil combustion unit.

10.1.5.2 Within the first three months of operation after installation/initial survey and three months prior to each renewal survey a sample of the discharge water from each EGCS should be drawn and analysed for nitrate content and results should be made available

[3] For any flow rate > 2.5 t/MWh fluorescence technology should be used.

to the Administration. However, the Administration may require an additional sample to be drawn and analysed at its discretion. The nitrate discharge data and analysis certificate is to be retained on board the ship as part of the EGCS Record Book and to be available for inspection as required by port State control or other parties. Criteria in respect of sampling, storage, handling and analysis should be detailed in the ETM-A or ETM-B as applicable. To assure comparable nitrate discharge rate assessment, the sampling procedures should take into account 10.1.5.1, which specifies the need for discharge water flow normalization. Nitrates discharge data is to be presented as the difference between concentrations in the inlet water and in the discharge water. The test method for nitrate should be ISO 13395:1996, ISO 10304-1:2007, US EPA 353.2 or other internationally accepted equivalent test standard (suitable for seawater).

10.1.5.3 Data on discharge water nitrate concentrations gathered from EGCSs of similar design could be used as an alternative to the sampling, analysis and quantification requirements of 10.1.5.2 with the agreement of the Administration based on an engineering analysis which demonstrates the design similarities in respect of nitrate concentrations in the discharge water.

10.1.6 Washwater and discharge water additives and other substances

10.1.6.1 Additional assessment of the discharge water may be required for those EGCS technologies which make use of chemicals, additives, preparations or create relevant chemicals in situ. The assessment may take into account relevant guidelines, such as the *Procedure for approval of ballast water management systems that make use of active substances (G9)* (resolution MEPC.169(57)), to determine if additional discharge water quality criteria are appropriate. If only the following chemicals are used and the discharge water pH does not exceed 8.0, no additional assessment is needed**:**

.1 neutralization agent (caustic substance), such as sodium hydroxide (NaOH) or sodium carbonate (Na_2CO_3); and

.2 flocculants, which are used for approved marine oily-water separating equipment.

10.1.7 Discharge water from temporary storage

10.1.7.1 Any discharge water originating from the EGCS and discharged overboard following temporary storage within any tank designed for that purpose and featured in the ETM-A or ETM-B should be monitored/recorded in accordance with 10.2.1, and meet, independent of any flow rate, the following discharge water criteria:

pH	See paragraph 10.1.2
PAH	Maximum of 50 µg/L PAH_{phe} (phenanthrene equivalence) before any dilution for control of pH
Turbidity	Not greater than 25 FNU (formazin nephlometric units) or 25 NTU (nephlometric turbidity units) or equivalent units, before any dilution for pH control

10.1.7.2 When demonstration of compliance with the provisions contained within this section is not possible, the water intended for discharge should be considered EGCS residue.

10.2 Discharge water monitoring

10.2.1 When the EGCS is operated in ports, harbours or estuaries, or during any discharges from temporary storage, the discharge water monitoring and recording should be continuous. The values monitored and recorded should include pH, PAH, turbidity and temperature. In other areas the continuous monitoring and recording equipment should also be in operation, whenever the EGCS is in operation, except for short periods of maintenance, and cleaning of the monitoring equipment as defined in the OMM. Whenever there are overboard discharges of discharge water from temporary onboard storage, no maintenance or cleaning of the monitoring equipment should take place. Those EGCS which apply degassing of the sampled discharge water for the purpose of turbidity monitoring should ensure that particles do not settle during degassing, as this would underestimate the real turbidity value.

10.2.2 The permissible deviations of the discharge water monitoring equipment should not exceed the following:

pH	0.2 pH units
PAH	5% of nominal standard test concentration used. That nominal concentration value should be not less than 80% of the scale range used
Turbidity	2 FNU or NTU

Calibration intervals should be such that the above performance requirements are met. Calibration and calibration checks should be done according to the manufacturer's specification.

10.2.3 The pH electrode and pH meter should have a resolution of 0.1 pH units and temperature compensation. The electrode performance and accuracy should at least comply with the requirements defined in BS 2586 or ASTM D1293-18 and the meter should meet or exceed IEC 60746-2:2003 or other internationally accepted equivalent standards. pH electrodes or pH meters which comply with another accepted standard or technical specification which is in force are deemed to be the equivalent of the equipment, provided these standards or technical specifications conform to standards BS 2586 or ASTM D1293-18 or IEC 60746-2:2003, and ensure at least a like-for-like level of requirements.

10.2.4 The PAH monitoring equipment should be capable of monitoring PAH in water in a range to at least twice the discharge concentration limit given in the table above. The equipment should be demonstrated to operate correctly and not deviate more than 5% in discharge water with turbidity within the working range of the application.

10.2.5 For those applications discharging at lower flow rates and higher PAH concentrations, ultraviolet light monitoring technology or equivalent should be used due to its reliable operating range.

10.2.6 The turbidity monitoring equipment should meet requirements defined in ISO 7027. The turbidimeter should identify when the turbidity is unable to be reliably quantified.

10.3 Approval of the discharge water monitoring systems

10.3.1 The discharge water monitoring system should be approved by the Administration.

10.4 Water monitoring data recording

10.4.1 The data recording system should comply with the requirements of sections 7 and 8 and should continuously record pH, PAH and turbidity in accordance with 10.2.1 at a frequency of not less than 0.0111 Hz.

10.4.2 Calibration and instrument drift data should, as given in the OMM, be either recorded by the data recording system or manually entered in the EGCS Record Book as appropriate to the means used.

10.5 EGCS Residues

10.5.1 Residues generated by the EGCS should be delivered ashore to adequate reception facilities. Such residues should not be discharged to the sea or incinerated on board.

10.5.2 Each ship fitted with an EGCS should record the storage and disposal of EGCS residues in the EGCS Record Book, including the date, time and location of such storage and disposal.

10.6 Maintenance and servicing records

10.6.1 The EGCS Record Book as required by either 4.4.9 or 5.7.1 should also be used to record maintenance and servicing of the washwater and discharge water monitoring systems and ancillary components as given in the OMM including like-for-like replacement.

10.7 Design guidance for water sampling points/valves

10.7.1 Each sampling point should be installed at a location that is representative of the main washwater or discharge water stream and accessible to personnel. The sampling extraction point should be open in the direction of the water flow.

APPENDIX 1

FORM OF SO_X EMISSION COMPLIANCE CERTIFICATE

Badge or Cipher

NAME OF ADMINISTRATION

SO_X EMISSION COMPLIANCE CERTIFICATE

CERTIFICATE OF APPROVAL FOR EXHAUST GAS CLEANING SYSTEMS

Issued under the provisions of the Protocol of 1997, as amended, to amend the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto under the authority of the Government of:

.....
(full designation of the country)

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

This is to certify that the exhaust gas cleaning system (EGCS) listed below has been surveyed in accordance with the specifications contained under Scheme A in the *20XX Guidelines for exhaust gas cleaning systems* adopted by resolution MEPC.YYY(ZZ).

This Certificate is valid only for the EGCS referred to below:

System manufacturer	**Model/ type**	**Serial number**	**This EGCS is certified as providing following equivalency:**		**EGCS – Technical Manual for Scheme A (ETM-A) approval reference**
			Fuel oil sulphur limit values:	**Maximum sulphur content of fuel oils to be used:**	
			0.10%	**_____% / n/a***	
			0.50%	**_____%**	

* delete as applicable

A copy of this Certificate should be carried on board the ship fitted with this EGCS at all times.

This Certificate is valid for the life of the EGCS, subject to surveys in accordance with subsection 4.2 of the Guidelines and regulation 5 of MARPOL Annex VI, installed in ships under the authority of this Government.

Issued at .....
(place of issue of certificate)

Date dd/mm/yyyy

....
(date of issue) (*signature of duly authorized official issuing the certificate)*

(Seal or Stamp of the authority, as appropriate)

APPENDIX 2

EMISSION RATIO

1 This appendix is included to explain the background to the use of the Emission Ratio, defined in 2.3 of these Guidelines, as the criterion for the demonstration of equivalency with the fuel oil sulphur limits given in regulation 14 of MARPOL Annex VI. In addition, the basis of the Emission Ratio limit values as given in 1.3 of these Guidelines is also explained.

2 The carbon content of any fuel oil used for power generation by combustion exits that system essentially in the form of carbon dioxide (CO_2). While certain amounts of the inflow carbon may form deposits within that system, be incorporated into any direct contact lubricant or exit in the exhaust gas as carbon monoxide or gaseous or particulate hydrocarbons, overall these quantities are not significant in comparison to the flow of CO_2. This applies equally to all combustion systems: internal combustion engines, boilers and gas turbines.

3 Similarly, the sulphur content of a fuel oil used for combustion will exit that system essentially as sulphur dioxide (SO_2) in the hot exhaust gas stream. Again, although a certain amount may be retained as sulphur compounds within the system or as other sulphur compounds in the exhaust gas stream, these are not significant in comparison to the flow of SO_2.

4 Hence, although the CO_2 concentration in the exhaust gas will vary in accordance with the excess air ratio applied, the ratio of CO_2 to SO_2 concentrations will be fixed by the carbon/sulphur ratio of the fuel oil used. In those instances where an exhaust gas cleaning system (EGCS) covered by these Guidelines is fitted, the effect will be to reduce the SO_2, but not the CO_2 content of the exhaust gas. Consequently, the SO_2/CO_2 ratio after the system will reflect the effectiveness of that system in removing SO_2 from the exhaust gas.[1] The post-EGCS SO_2/CO_2 ratio, the Emission Ratio, will largely correspond to that which would otherwise have been obtained if a lower sulphur fuel oil had been used but without the EGCS.

5 The principal elements present in petroleum-derived liquid fuel oils are carbon, hydrogen and sulphur and in some instances also nitrogen and oxygen. The actual proportions differ in each case. In order to derive the Emission Ratios corresponding to different fuel oil sulphur limit values, the fuel oil compositions given in 6.4.11.1.2 (table 9) of the NO_X Technical Code 2008 are taken as the starting points in table 1 below. The given compositions for both distillate and residual fuel oils omit sulphur content, but these are simply the difference between the summation of the given values and 100% and hence are 0.20% for the distillate example and 2.60% for the residual. In order to estimate the carbon and hydrogen proportions of fuel oils with other sulphur content values the carbon/hydrogen ratio and the "nitrogen+oxygen" content are assumed to be unchanged for the respective fuel oils. In table 1 the carbon contents are calculated for fuel oil having a sulphur content for both the distillate and the residual fuel oil of 1.50% as has been used in earlier versions of these Guidelines.

6 From the derived carbon contents and selected sulphur content value the molar ratio of fuel sulphur to fuel carbon is obtained in table 2 and from those the corresponding ratios of SO_2 and CO_2. One of the particular features of petroleum-derived liquid fuel oils is that despite the wide range of physical properties, such as viscosity and density, between distillates and residuals there is only a very limited range in terms of carbon composition. Hence it is a reasonable proposition to use a single SO_2/CO_2 ratio in order to represent all such fuel oils; in this instance 65 has been taken to correspond to the Emission Ratio which would be obtained if using a fuel oil of 1.50% sulphur content.[2] The value of 1.50% sulphur content was used as the basis of these calculations as that was the original limit value for Emission Control Areas as given by the MARPOL Annex VI text as adopted in 1997, and which has been subsequently amended.

7 From the Emission Ratio corresponding to 1.50% sulphur the Emission Ratios corresponding to the various sulphur limits now given in regulation 14 of MARPOL Annex VI are obtained (see table 3).

Table 1: Fuel oil carbon content values

Distillate fuel oil – petroleum-derived

Carbon	Given	% m/m	86.2	
	Calculated	% m/m		85.08
Hydrogen	Given	% m/m	13.6	
	Calculated	% m/m		13.42
Sulphur		% m/m	0.2	1.50
Nitrogen + Oxygen		% m/m	0	0
Carbon / Hydrogen ratio			6.338	6.338

Residual fuel oil – petroleum-derived

Carbon	Given	% m/m	86.1	
	Calculated	% m/m		87.08
Hydrogen	Given	% m/m	10.9	
	Calculated	% m/m		11.02
Sulphur		% m/m	2.60	1.50
Nitrogen + Oxygen		% m/m	0.40	0.40
Carbon / Hydrogen ratio			7.899	7.899

Table 2: Emission Ratio values for 1.50% sulphur fuel oil

			Distillate	Residual
Fuel	Carbon	% m/m	85.08	87.08
	Sulphur	% m/m	1.50	1.50
	Carbon	mol/kg	70.90	72.57
	Sulphur	mol/kg	0.469	0.469
	S/C ratio	mol/mol	0.00661	0.00646
Exhaust gas Emission Ratio		SO_2 ppm / CO_2 %	66.12	64.60
			65	

Table 3: Emission Ratios corresponding to fuel oil sulphur content[2]

Fuel oil sulphur content % m/m	Emission Ratio
1.50	65
0.50	21.7
0.10	4.3

Note 1. Should treatment systems be developed that also reduce the CO_2 content, the core principle still applies except that in order to assess effectiveness in terms of SO_2 reduction the CO_2 value used would be that prior to that reduction i.e. CO_2 being measured at a point upstream of that treatment device.

Note 2. The given Emission Ratios only apply where a petroleum-derived liquid fuel oil is being used. For other fuel oils specific Emission Ratio values would need to be determined, and approved by the Administration, based on the particular composition of the fuel oil in question.

APPENDIX 3

DISCHARGE WATER DATA COLLECTION

1 Introduction

1.1 The discharge water quality criteria are intended to act as initial guidance for implementing EGCS designs. The criteria should be reviewed in the future as more data become available on the contents of the discharge and its effects, taking into account any advice given by GESAMP.

1.2 Administrations should therefore invite the collection of relevant data. To this end, shipowners in conjunction with the EGCS manufacturer are invited to sample and analyse samples of EGCSs, taking into account section 2 and section 3 of this appendix, as appropriate.

1.3 The sampling could be conducted during approval testing or shortly after commissioning and at about 12-monthly intervals.

2 Recommended procedure for sampling

In order to evaluate the contents of the discharge water and its effects, it is recommended that samples be analysed for the parameters listed under paragraph 2.4.1 of this appendix.

2.1 Preparation

2.1.1 This section describes preparations recommended prior to any sampling.

2.1.2 The EGCS should be equipped with sampling points for sampling of the following water streams:

.1 inlet water (for background);

.2 water after the EGC unit after treatment (if applicable) but before any kind of dilution; and

.3 discharge water after treatment and dilution.

2.1.3 Preparation for sampling, handling and transport

2.1.3.1 Sampling equipment

The sampling equipment and pre-prepared sample containers should be made ready prior to sampling. The equipment can be ordered from the laboratory performing the analysis. The equipment should be ordered well before the sampling takes place, taking into consideration the itinerary of the ship.

The table below lists the recommended physical properties of the sampling bottles needed. It takes ISO 5667-3 and the appropriate analytical standard into account, but other equivalent standards can also be used. The table furthermore informs how the samples should be stored when drawn and when at the latest they need to reach the laboratory for analysis.

Parameter	Bottle material	Volume	Method specifying sampling bottle requirements	Preservative	Storage temperature	Maximum time until analysis
NO_2^-/NO_3^-	PE	250 mL	ISO 10304-1	No preservative	Frozen (≤ -18°C)	8 days
Total Metals	PE	500 mL	ISO 17294-2	HNO_3 Acid	Cooled (4°C) / dark	1 month
Dissolved Metals	PE	500 mL	ISO 17294-2	No preservative	Cooled (4°C) / dark	1 month
PAHs	Amber-glass with PTFE seal	2 L (OL), 1 L (CL)	DIN EN 16691 or EPA 8270	No preservative	Cooled (4°C) / dark	7 days
Hydrocarbon oil index (GC-FID analysis)	Glass	1L	ISO 9377-2	Mineral acid pH<2	Cooled (4°C) / dark	4 days

It is practical to label sampling bottles before sampling. Identify each bottle such that it can be tracked back to sampling point, sampling parameter, EGCS operation mode and EGCS load.

2.1.3.2 Preparation for storage and holding of samples

To ensure proper storage and holding, crew need to appoint an appropriate space on board for samples and ice packs, preferably in an enclosed container in a cool space without direct sunlight.

2.1.3.3 Preparation for transport

If samples need to be transported with ice packs, the ice packs should be deep-frozen at least 48 h prior to sampling.

It is recommended to arrange shipping of the samples in advance with the port agent of the destination port.

2.1.3.4 Preparation of personnel conducting the sampling

To ensure the health and safety of the personnel, it is recommended to wear the following equipment:

2.1.3.4.1 Protective eyeglasses/goggles, ear protection, gloves, protective clothing and safety shoes

2.1.3.5 Personnel qualifications and responsibilities.

It is important that the personnel taking the samples are well trained. They should be aware of:

.1 how the system is working and where the sampling points are located; and

.2 how to dispose of the flushing water collected during flushing.

The personnel should be competent in drawing samples and should know the location of the sampling points and how to safely dispose of the collected flushing water.

2.1.3.6 Information prior to sampling

It is recommended to complete the templates under 3.1 prior to sampling.

2.2 Collection

2.2.1 Sample time schedule

It is recommended to prepare a sampling time plan in advance in agreement with the crew, considering when at the latest the samples need to be analysed at laboratory. The sampling plan should contain information that can identify which bottle contains which water (OL/CL, inlet/outlet, etc.) and at which hour the sample was drawn. In this manner, continuous recorded EGCS control parameters can be retrieved at a later stage. Sampling should be undertaken with the EGCS operating above 50% of maximum exhaust gas flow (4.2.2.1.2.1 / 5.6.1.2.1).

2.2.2 Filling the sampling bottle

To prevent contamination during sampling, the following practices are recommended:

.1 use sampling bottles prepared by the laboratory;

.2 the water flow and thus the engine load(s) should be steady before and during sampling;

.3 the sampling valve should be flushed with a minimum of 10 litres of sampling water before samples are taken and it should not be closed or touched after flushing or before the sampling is done;

.4 if more than one bottle is filled, the sampling valve should not be closed in between;

.5 the use of any hydrocarbon-based cleaning agents at the sampling point should be avoided; and

.6 fill the sampling bottles to the brim and close firmly to avoid air in the bottles.

2.2.3 Information while sampling

It is recommended to complete the template under 3.2 while sampling.

2.3 Transportation

Sampling equipment to be used during transportation should meet provisions under 2.1.3.1 above.

2.3.1 Transportation container

For transportation an insulated and leak-proof container should be used. The transportation container should be provided by the laboratory. It should be able to hold a sufficient quantity of ice packs.

2.3.2 Shipping to the laboratory

Samples should be shipped to the laboratory as fast as possible. The transportation container should be labelled in accordance with local requirements for shipping and handling of water samples.

Immediately before handing over the samples to the port agent, the ice packs should be put into the box.

2.3.3 Chain of custody

A formal chain of custody process is required, with records.

Usually it is not necessary to include a customs declaration as these are water samples of zero commercial value.

2.3.4 Information from the laboratory

Take into consideration any information provided by the laboratory.

2.4 Sample preparation and analysis

Analysis should be undertaken by ISO 17025-accredited laboratories using EPA, ISO or equivalent test procedures. Methods used in the laboratories need to be within the scope of ISO 17025 accreditation of the laboratory.

2.4.1 To ensure comparability of laboratory results, the following methods are recommended:

Parameter	Recommended method for sample analysis	Recommended method for sample preparation
Polycyclic Aromatic Hydrocarbons (PAH): 16 EPA PAHs: Acenaphthene Acenaphthylene Anthracene Benzo-a-anthracene Benzo-a-pyrene Benzo-b-fluoranthene Benzo-g,h,i-perylene Benzo-k-fluoranthene Chrysene Dibenzo-a,h-anthracene Fluoranthene Fluorene Indeno-1,2,3-pyrene Naphthalene Phenanthrene Pyrene Sum of 16 PAHs	EN 16691:2015 or ISO 28540:2011 (recognizing EN 16691 as ISO is currently under consideration) or EPA 8270	* * EPA 3510; or EPA 3511; or EPA 3520.
Oil detailed GC FID analysis	ISO 9377-2:2000	*

Determination of Hydrocarbons Oil Index		
Nitrate and nitrite (NO_3-/NO_2-)	ISO 10304-1:2007 or ISO 15923-1:2013 or ISO 13395:1996 or EPA 353.2	* * * *
Total Metals: - Cd - Cu - Ni - Pb - Zn - As - Cr - V - Se	ISO 17294-2:2016 or EPA 200.8 or EPA 200.9	ISO 15587-1:2002 * *
Dissolved Metals: - Cd - Cu - Ni - Pb - Zn - As - Cr - V - Se	ISO 17294-2:2016 or EPA 200.8 or EPA 200.9	ISO 17294-2:2016 and filtration on 0.45 µm + HNO_3 EPA 200.8 and filtration on 0.45 µm + HNO_3 EPA 200.9 and filtration on 0.45 µm + HNO_3
Discharge water pH should be determined by instant onboard measurements	Record pH immediately on board	Record pH immediately on board

* Preparation method is included in the analytical method.

3 Recommended template for submitting sampling data

When submitting sampling data to the Administration, the data should include information according to paragraphs 1 and 2 as well as the results from the analyses as described under paragraph 2.4.

When submitting sampling data to the Administration, the following template is recommended.

3.1 Data Template Part 1 **Information prior to sampling**		
Parameter	Value	Unit
3.1.1 Ship information		
Ship's name		
IMO number		
Ship build date		dd.mm.yyyy
3.1.2 Combustion unit(s) details Engine questions should be answered for every fuel-burning facility connected to the EGCS		

Number of combustion units connected to EGCS		
Combustion unit(s) manufacturer(s)		
Type of combustion unit(s) (ME, AE, 2/4-stroke, boiler)		
EGCS capacity in MW		
3.1.3 EGCS general		
Name of manufacturer		
Name of system		
Number of streams	single/multiple	
System operation mode	open/closed/hybrid	
Type of washwater treatment		
EGCS retrofit or new building		
Installation date		
ETM scheme A or B approval		
Additional notes:		

3.2 Information in conjunction with sampling for each operation mode (OL and/or CL)		
Parameter	Value	Unit
3.2.1 Ship information during sampling		
Cruise speed		knots
Start of sampling date and time		UTC
Stop of sampling date and time		UTC
Ship's position start of sampling		GPS
Ship's position end of sampling		GPS
Weather conditions (during sampling)		calm/rough
3.2.2 EGCS operation		
Approx. EGCS load		%
System operation mode	open/closed	
Type of washwater treatment, if any		
Added chemicals for treatment		Name
Dosage rate of added chemicals for treatment during sampling		l/m³
Average washwater flow rate to EGCS during sampling period		m³/h
Average dilution water flow rate during sampling period, if given or relevant		m³/h
3.2.3 Combustion unit(s) operation		
Approx. total combustion unit(s) load to EGCS		MW
Total fuel consumption		t/h
Fuel sulphur content (according BDN)		
Fuel viscosity if available		
Additional notes:		

3.2.4 Online monitoring readings during sampling, for each sampling point			
Monitoring unit	pH	PAH_{phe} µg/L or ppb	Turbidity FNU or NTU
Inlet (if available), average during sampling period			
Discharge point, average during sampling period (outlet)		NA	NA
Before dilution, average during sampling period	NA		

3.2.5 Results to be reported by the laboratory				
Question	Answer		Comments	
Satisfactory temperature at arrival	Yes/No			
Sampling bottles and transportation container prepared by laboratory	Yes/No			
Methods within the scope of ISO 17025 accreditation of the laboratory	Yes/No			
Date and time samples arrived at laboratory				
Date and time of analyses				
Parameter	Bottle ID	Preparation method	Analytical method	Result + unit
Polycyclic Aromatic Hydrocarbons (PAH): 16 EPA PAHs: Acenaphthene Acenaphthylene Anthracene Benzo-a-anthracene Benzo-a-pyrene Benzo-b-fluoranthene Benzo-g,h,i-perylene Benzo-k-fluoranthene Chrysene Dibenzo-a,h-anthracene Fluoranthene Fluorene Indeno-1,2,3-c,d-pyrene Naphthalene Phenanthrene Pyrene				
Hydrocarbon Oil Index GC-FID analysis				
Nitrate and nitrite (NO_3^-/NO_2^-)				

Total Metals: - Cd - Cu - Ni - Pb - Zn - As - Cr - V - Se				
Dissolved Metals: - Cd - Cu - Ni - Pb - Zn - As - Cr - V - Se				

3.2.6 List of bottle IDs or chain of custody (COC)

Sampling point	Parameter PAH	Parameter Metals	Parameter X
Inlet	Bottle #1 + time stamp	Bottle #2 + time stamp	Etc.
discharge point	Bottle # + time stamp	Bottle # + time stamp	Etc.
Etc.	Etc.	Etc.	Etc.

APPENDIX 4

STANDARD SEAWATER TITRATION CURVE

1 The following is a description of the chemical equilibrium model and the resulting titration curve shown in the graph below (figure 1 for pure seawater). The equilibrium model may include the effect of adding an additional alkali to the seawater (e.g. NaOH).

2 The titration curve in figure 1 is prepared by using a chemical equilibrium model for seawater. The model includes inorganic carbon, boric acid, sulphate, fluoride and dissolved SO_2 equilibria; the equilibrium constants are functions of salinity (ionic strength) and temperature. The apparent pKa values for the equilibrium reactions are found in general oceanography literature, e.g. *An Introduction to the Chemistry of the Sea,* Michael E.Q. Pilson*,* Cambridge University Press (2013)*,* and in the publication "The solubility of SO_2 and the dissociation of H_2SO_3 in NaCl solutions", F. Millero, P. Hershey, G. Johnson and J. Zhang, *Journal of Atmospheric Chemistry*, 8 (1989). pH is given on the NBS scale.

3 Basis for the computed curve:

.1 Released CO_2 retained in solution, i.e. no forced stripping of CO_2;

.2 10% of dissolved S(IV) oxidized to S(VI) inside EGCS;

.3 Seawater alkalinity 2.2 mmol/L;

.4 Seawater salinity 35 psu;

.5 Seawater pH 8.2; and

.6 Seawater temperature 32°C.

4 Fit equation. The fit equation for pure seawater is provided based on an empirical equation fit to the EM curve. The equation is:

$$pH = 3.84 - 0.2308 \cdot SO_2 + \frac{1.403}{\left(0.0403 + exp\left(2.966 \cdot (SO_2 - 0.189)\right)\right)} + \frac{9.947}{\left(4.605 + exp\left(4.554 \cdot (SO_2 - 1.588)\right)\right)}$$

where the variable SO_2 is defined as SO_2 absorbed in mmol/kg seawater.

The "fit equation" is used for the determination of the dilution factor.

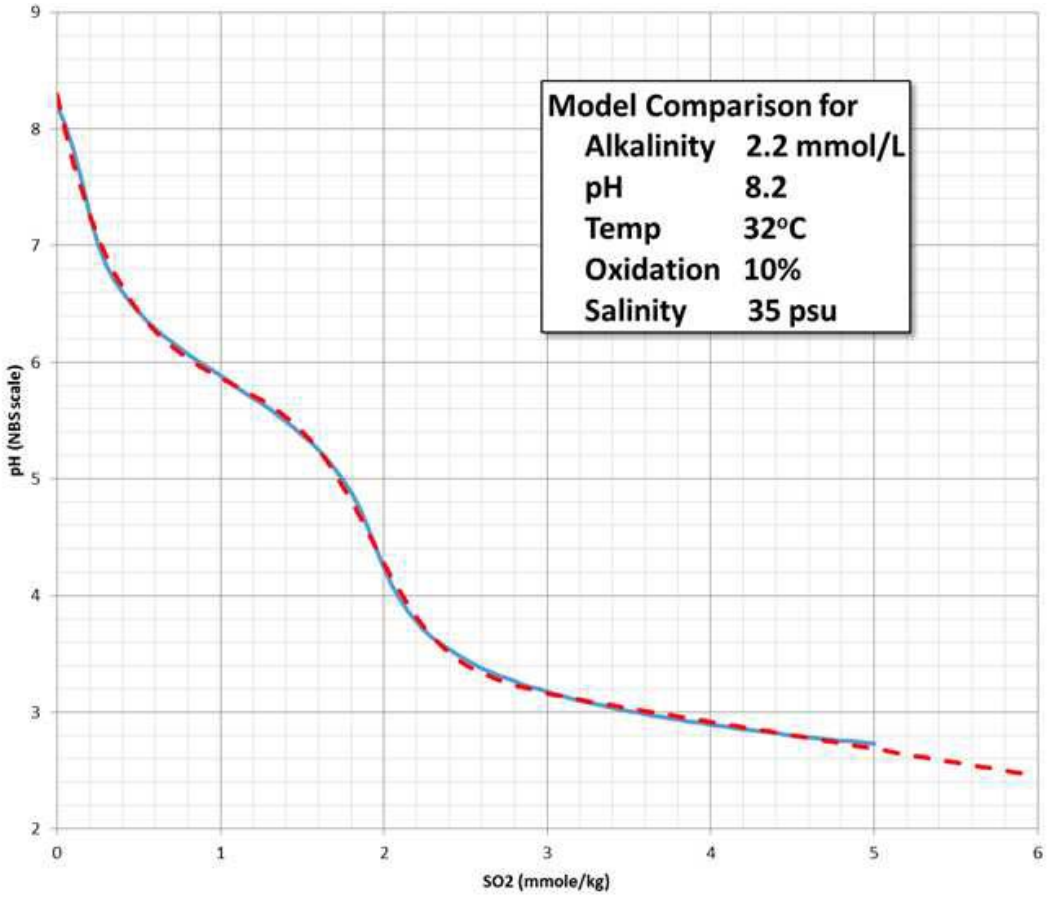


Figure 1 – pure seawater titration curve

APPENDIX 5

ANALYSER INFORMATION TEMPLATES

Under subsection 8.2 of these Guidelines certain information, as a minimum, should be included in the OMM in order to facilitate surveys and inspections.

Paragraph 8.2.4 requires that information should be given in respect of the exhaust gas and discharge water analysers used in the respective monitoring systems. In order to provide a common approach to the layout and detail which should be included, the following templates are provided and may be used in the OMM. These templates represent the minimum information which should be given. Additional information may be required by the Administration.

The use of these templates is voluntary; however, a standardized layout will assist all users of the OMM.

Exhaust gas

SO_2 / CO_2 measurement Where common, so indicate		
Analyser	SO_2	CO_2
Analyser manufacturer		
Model reference		
Onboard identification reference		
Arrangement	In situ/extractive	In situ/extractive
Probe location		
Probe description	(i.e. probe length, single/multiple hole/heated filter/heated pump)	(i.e. probe length, single/ multiple hole/heated filter/ heated pump)
Maximum measurement range	ppm	%
Used measurement range(s)	ppm	%
Zero gas specification		
Span gas specification		
Details of: service, maintenance, calibration schedules	Task/interval	Task/interval
Additional information		
Extractive systems only:		
Application	Single or multiple exhaust ducts (if multiple – state which ducts covered and sampling sequence, residence and purge times)	Single or multiple exhaust ducts (if multiple – state which ducts covered and sampling sequence, residence and purge times)

Sample line heated (if yes – maintained temperature ºC)	Yes/No	Yes/No
Sample line details	Length, inner diameter	Length, inner diameter
Cooler/dryer: Manufacturer Model reference		
Additional information		

Water monitoring

pH/PAH/Turbidity* *delete as applicable	
Application	Seawater inlet/discharge water*
Analyser manufacturer	
Model reference	
Onboard identification reference	
Arrangement	In situ/bypass*
Position of sensor	
Maximum measurement range/units	
Used measurement range(s)/units	
Calibration fluid(s) – specification/ concentration/units	
Details of: service, maintenance, calibration schedules	Task/interval
Additional information	

***

ANNEX 2

RESOLUTION MEPC.341(77)
(adopted on 26 November 2021)

STRATEGY TO ADDRESS MARINE PLASTIC LITTER FROM SHIPS

THE MARINE ENVIRONMENT PROTECTION COMMITTEE

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

ACKNOWLEDGING that work to prevent pollution by garbage from ships has been undertaken by the Organization since the adoption of MARPOL Annex V,

ACKNOWLEDGING ALSO the relevance of the work on marine plastic litter undertaken by the Parties to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 and its 1996 Protocol, including the adoption in 2016 of a "Recommendation to Encourage Action to Combat Marine Litter",

ACKNOWLEDGING FURTHER the relevant work of other international organizations in relation to marine plastic litter, in particular FAO and UNEP and work under the United Nations Environment Assembly, as well as the importance of existing advisory and cooperation mechanisms, including GESAMP, the Joint FAO/IMO Ad Hoc Working Group on IUU Fishing and Related Matters, and the Global Partnership for Marine Litter,

RECALLING the United Nations 2030 Agenda for Sustainable Development, in particular Sustainable Development Goal (SDG) 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development,

RECALLING ALSO that the Assembly, at its thirtieth session, in December 2017, recognized the ongoing problem of marine plastic pollution, as addressed in MARPOL Annex V, which required further consideration as part of a global solution within the framework of ocean governance, in pursuance of the target of SDG 14 to prevent and significantly reduce marine pollution of all kinds by 2025,

RECALLING FURTHER resolution MEPC.310(73) by which it adopted the Action Plan to Address Marine Plastic Litter from Ships (the Action Plan),

1 ADOPTS the Strategy to Address Marine Plastic Litter from Ships (the Strategy) to guide, monitor and oversee the timely and effective implementation of the Action Plan, as set out in the annex to the present resolution;

2 INVITES the Secretary-General of the Organization to make adequate provisions in the Integrated Technical Cooperation Programme (ITCP) to support relevant follow-up actions of the Strategy;

3 AGREES to undertake a review of the Strategy in 2025 and notes that a review of the actions within the Action Plan will be undertaken in 2023.

ANNEX

STRATEGY TO ADDRESS MARINE PLASTIC LITTER FROM SHIPS

1 Background

1.1 IMO has recognized the importance of preventing pollution by garbage, including plastics, from ships since the adoption of MARPOL Annex V. IMO has also recognized the importance of preventing the dumping of various types of waste, including plastics, into the sea through the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (London Convention or LC) and its 1996 Protocol (London Protocol or LP). IMO has also committed to working closely with a number of partners to address the issue of marine plastic litter. However, studies demonstrate that, despite the existing regulatory framework to prevent marine plastic litter from ships, discharges into the sea continue to occur.

1.2 IMO recognized the ongoing problem of marine plastic pollution required further consideration, in pursuance of the target of Sustainable Development Goal 14 to prevent and significantly reduce marine pollution of all kinds by 2025. In recognition of the urgency to address marine plastic litter from ships, IMO adopted the *Action Plan to Address Marine Plastic Litter from Ships* (resolution MEPC.310(73)).

2 Vision

2.1 IMO remains committed to reducing marine plastic litter entering the marine environment from all ships, including fishing vessels. As a matter of urgency, IMO aims to strengthen the international framework and compliance with the relevant IMO instruments, endeavouring to achieve zero plastic waste discharges to sea from ships by 2025.

3 Objective and outcomes

3.1 The objective of this Strategy is to guide the implementation of the Action Plan to best achieve the outcomes of the Action Plan, by the establishment of a timeline and identification of appropriate modalities.

3.2 In considering the Action Plan, it is useful to consider the following outcomes as key goals:

.1 reduction of marine plastic litter generated from, and retrieved by, fishing vessels;

.2 reduction of shipping's contribution to marine plastic litter; and

.3 improvement of the effectiveness of port reception and facilities and treatment in reducing marine plastic litter;

and the following further efforts which could aid in achieving the goals, inter alia:

.4 enhanced public awareness, education and seafarer training;

.5 improved understanding of the contribution of ships to marine plastic litter;

.6 improved understanding of the regulatory framework associated with marine plastic litter from ships;

.7 strengthened international cooperation; and

.8 targeted technical cooperation and capacity-building.

4 Time frame

4.1 The following groups of actions under the Action Plan have been identified:

.1 actions that can be progressed now by relevant sub-committees, which could be referred to as short-term actions;

.2 actions that may be reliant on the outcomes of the IMO Study on marine plastic litter, or other relevant research, in order to progress, which could be referred to as mid-term actions;

.3 actions which require concrete proposals to the Committee in order to progress, and could therefore be considered long-term actions; and

.4 actions which would continuously be addressed over the life of the Action Plan.

4.2 The table grouping short-, mid-, long-term and continuous actions is set out in annex 1.

4.3 In line with the time frames provided in Sustainable Development Goal 14, the actions of the Action Plan should be completed or in progress by 2025. The time frame and actions associated with progressing short-, mid-, long-term and continuous actions; the IMO Study on Marine Plastic Litter; and the review and evaluation of actions up to 2025; is set out in annex 2.

5 Method of work

5.1 The impact on small island developing States and on remote locations such as polar regions when planning for the discharge of waste to land-based facilities (action item 18), should be considered when progressing each individual action related to addressing the discharge of plastic litter to reception facilities.

5.2 The actions in the Action Plan will be reviewed at MEPC based on follow-up proposals and commenting documents by interested Member States and international organizations. Following such a review, the Committee would instruct the PPR Sub-Committee or other sub-committees, as appropriate, to undertake work only on actions for which a well-defined scope of work had been developed.

5.3 During the ongoing development of the Action Plan, consideration should be given to how to assess compliance and effectiveness of actions.

5.4 For actions where the coordinating/associated organ is a sub-committee under MSC, the preferred way forward will be for proposals for a new output to be submitted to MSC in order for MSC to instruct the appropriate sub-committee accordingly.

5.5 For actions where the coordinating/associated organ is another committee, submission of documents to the relevant committee will be the preferred way forward.

6 Monitoring, evaluation and review

6.1 This Strategy will be monitored and evaluated to ensure that it continues to deliver against its objective and outcomes. In this regard, IMO will carry out a comprehensive review of the Strategy in 2025.

6.2 In accordance with resolution MEPC.310(73), IMO will also undertake a review of the Action Plan in 2023.

ANNEX 1

GROUPING OF SHORT-, MID-, LONG-TERM AND CONTINUOUS ACTIONS OF THE ACTION PLAN TO ADDRESS MARINE PLASTIC LITTER FROM SHIPS

	Outcome	Actions
Short-term actions		
4	**Reduction of marine plastic litter generated from, and retrieved by, fishing vessels**	Preparation of a circular reminding IMO Member States to collect information from their registered fishing vessels regarding any discharge or accidental loss of fishing gear
7		Review the application of placards, garbage management plans and garbage record-keeping (regulation 10, MARPOL Annex V), for example making the Garbage Record Book mandatory for ships of 100 GT and above
8		Preparation of a circular reminding Member States to enforce MARPOL Annex V on fishing vessels through PSC measures Encourage port State control MoUs to develop PSC procedures that include fishing vessels
9	**Reduction of shipping's contribution to marine plastic litter**	Review the application of placards, garbage management plans and garbage record-keeping (regulation 10, MARPOL Annex V), for example making the Garbage Record Book mandatory for ships of 100 GT and above
10		Consider the establishment of a compulsory system of formatted declarations of the loss of containers and the means on board to easily identify the exact number of losses Also, consider establishing an obligation to report through a standardized procedure the loss of containers
11		Consider ways to communicate the location of containers lost overboard based on additional information to be provided by interested parties
13		Consider enhancing the enforcement of MARPOL Annex V, including, where possible, through a risk-based approach
17	**Improvement of the effectiveness of port reception and facilities and treatment in reducing marine plastic litter**	IMO to encourage Member States to effectively implement their obligation to provide adequate facilities at ports and terminals for the reception of garbage, as required by regulation 8 of MARPOL Annex V Take into consideration work being undertaken under the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (London Convention or LC) and its 1996 Protocol (London Protocol or LP) (LC/LP) on this issue
19	**Enhanced public awareness, education and seafarer training**	Consider ways to promote the work of IMO to address marine plastic litter generated from ships

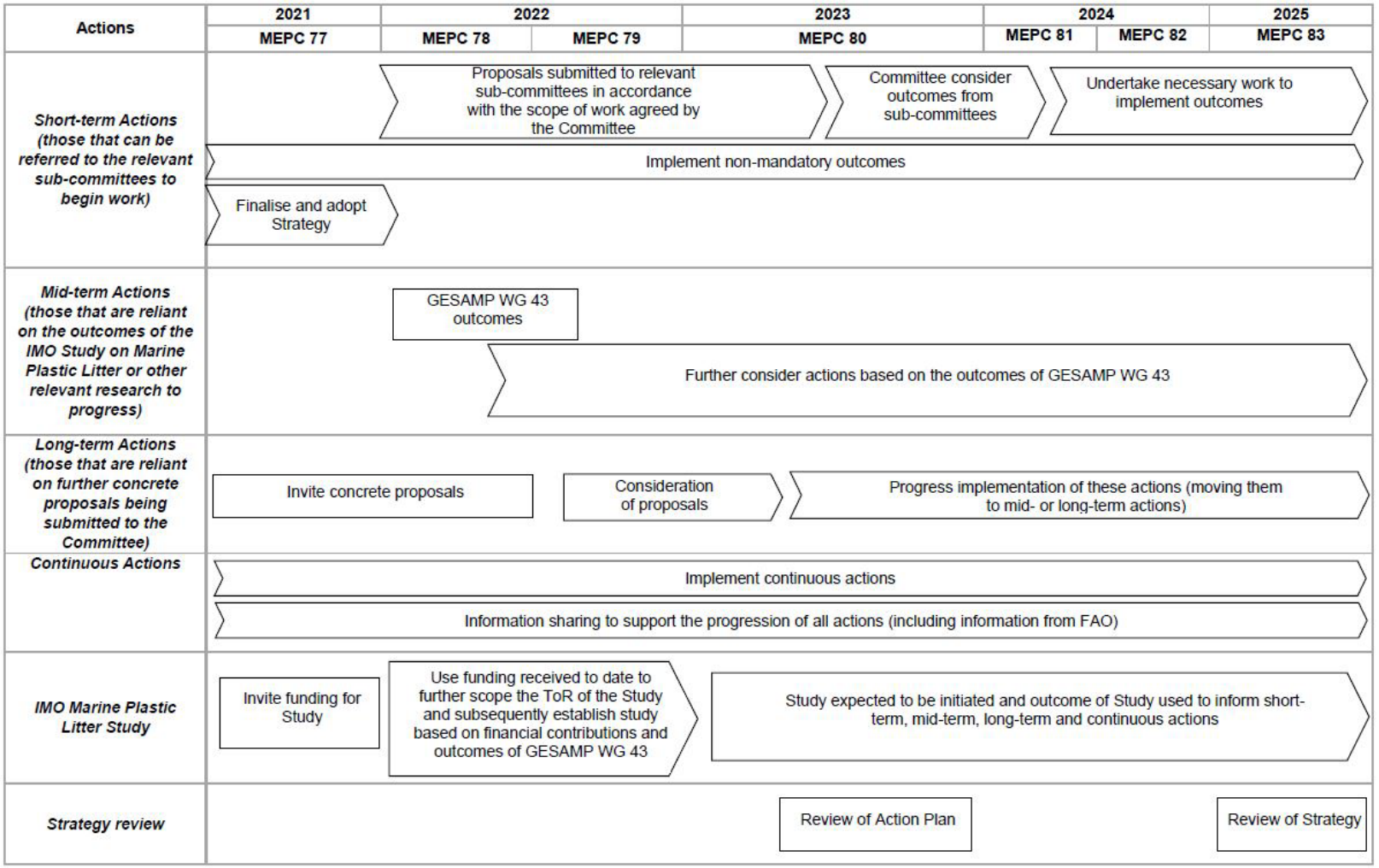
	Outcome	Actions
20		Consider tasking the HTW Sub-Committee with reviewing chapter III of STCW-F (Basic safety training for all fishing vessel personnel) to ensure that all fishing vessel personnel, before being assigned any shipboard duties, receive basic training on marine environment awareness oriented on marine plastic litter including abandoned, lost or otherwise discarded fishing gear (ALDFG)
21		Consider how the model course "Marine Environmental Awareness 1.38" could be amended/revised to specifically address marine plastic litter Further consider how to ensure familiarization of all seafarers within the existing STCW (International Convention on Standards of Training, Certification and Watchkeeping for Seafarers) minimum requirements and taking into account existing best practice, guidelines and programmes
22	**Improved understanding of the contribution of ships to marine plastic litter**	Consider extending the reporting requirement in regulation 10.6 of MARPOL Annex V to include reporting data on discharge or accidental loss of fishing gear by the flag State to IMO via GISIS or other means, if appropriate
23		Encourage Member States and international organizations that have conducted any scientific research related to marine litter to share the results of such research, including any information on the areas contaminated by marine litter from ships
24		Conduct a study on marine plastic litter, including macro and microplastics, from all ships
25		Invite Member States and international organizations to undertake studies to better understand microplastics from ships
26	**Improved understanding of the regulatory framework associated with marine plastic litter from ships**	Consider the development of a regulatory framework matrix for the purpose of a gap analysis
27	**Strengthened international cooperation**	Make information available to the United Nations Environment Assembly (UNEA)
28		Continue work with other United Nations bodies and agencies, as well as with international forums, which are active in the matter of marine plastic litter from shipping, such as through the Global Partnership on Marine Litter (GPML)
Mid-term actions		
2		Consider making mandatory, through an appropriate IMO instrument (e.g. MARPOL Annex V), the marking of fishing gear with the IMO Ship Identification Number, in cooperation with the Food and Agriculture Organization of the United Nations (FAO)

	Outcome	Actions
3		Further investigate logging of the identification number for each item of fishing gear on board a fishing vessel
5		Consider the development of best management practice to facilitate incentives for fishing vessels to retrieve derelict fishing gear and deliver it to port reception facilities, in collaboration with FAO
6		Consider the issue of waste that has been collected during fishing operations building on experience gathered from established projects
14	**Improvement of the effectiveness of port reception and facilities and treatment in reducing marine plastic litter**	Consider the requirement for port reception facilities to provide for separate garbage collection for plastic waste from ships, including fishing gear to facilitate reuse or recycling
15	**Improvement of the effectiveness of port reception and facilities and treatment in reducing marine plastic litter**	Consider mechanisms to enhance the enforcement of MARPOL Annex V requirements for the delivery of garbage to reception facilities
16		Consider the development of tools to support the implementation of cost frameworks associated with port reception facilities, taking into account the need to not create disincentives for the use of port reception facilities, the potential benefits of cost incentives that provide no additional fees based on volume and identifying waste types that can be reduced, reused or recycled through schemes that identify waste revenue
17		Consider facilitating the mandatory use of port waste management plans to ensure the provision of adequate waste reception facilities Encourage Member States to address the entire process of plastic garbage handling and ensure that landed garbage is managed in a sustainable manner ashore Identify information from the port waste management plans that can be shared via the Global Integrated Shipping Information System (GISIS)
18		Further consider the impact on small island developing States and on remote locations such as polar regions when planning for the disposal of waste to land-based facilities
Long-term actions		
1	**Reduction of marine plastic litter generated from, and retrieved by, fishing vessels**	Consider making the IMO Ship Identification Number Scheme mandatory for all fishing vessels over 24 metres in length through an amendment to the Cape Town Agreement once it enters into force Encourage the ratification of the Cape Town agreement

	Outcome	Actions
12	**Reduction of shipping's contribution to marine plastic litter**	Consider the most appropriate instrument to address the responsibility and liability for plastic consumer goods lost at sea from ships
Continuous actions		
29	**Targeted technical cooperation and capacity-building**	Address implementation issues related to the Action Plan to Address Marine Plastic Litter from Ships in the context of IMO technical cooperation and capacity-building activities
30		Consider the establishment of externally funded major projects under the auspices of IMO in support of the action plan to address marine plastic litter from ships
1	**Reduction of marine plastic litter generated from, and retrieved by, fishing vessels**	Encourage the ratification of the Cape Town agreement

ANNEX 2

TIMELINE OF FOLLOW-UP ACTIONS FOR THE ACTION PLAN TO ADDRESS MARINE PLASTIC LITTER FROM SHIPS



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ANNEX 3

RESOLUTION MEPC.342(77)
(adopted on 26 November 2021)

PROTECTING THE ARCTIC FROM SHIPPING BLACK CARBON EMISSIONS

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 MEPC 62 agreed to a work plan including an investigation of appropriate control measures to reduce the impact on the Arctic of Black Carbon emissions from international shipping,

RECALLING FURTHER that MEPC 77 approved the updated terms of reference for further work on the reduction of the impact on the Arctic of Black Carbon emissions starting with guidelines on goal-based control measures to reduce the impact on the Arctic of Black Carbon emissions from international shipping,

RECOGNIZING that Black Carbon is a potent short-lived contributor to climate warming, and as such was subject to study in the Fourth IMO GHG Study 2020,

HAVING CONSIDERED the threat to the Arctic from ships' Black Carbon emissions and understanding that the development of goal-based guidelines and any mandatory control measures will require further work and time,

RECOGNIZING that the Fourth IMO GHG Study's emission factors show that, when used in the same engine, a switch to distillate reduces Black Carbon emissions per kilogram of fuel consumption,

ENCOURAGING Member States to commence addressing the threat to the Arctic from Black Carbon emissions, and report on measures and best practices to reduce Black Carbon emissions from shipping,

URGES Member States and ship operators to voluntarily use distillate or other cleaner alternative fuels or methods of propulsion that are safe for ships and could contribute to the reduction of Black Carbon emissions from ships when operating in or near the Arctic.

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ANNEX 4

DRAFT AMENDMENTS TO MARPOL ANNEX II

(Abbreviated legend to the revised GESAMP Hazard Evaluation Procedure)

Appendix I

Guidelines for the categorization of noxious liquid substances

The tables under the title "Abbreviated legend to the revised GESAMP Hazard Evaluation Procedure" are replaced by the following:

"

	A **Bioaccumulation and Biodegradation**			**B** **Aquatic Toxicity**	
Numerical Rating	A1 Bioaccumulation		A2 Biodegradation	B1 Acute Toxicity $LC/EC/IC_{50}$ (mg/L)	B2 Chronic Toxicity EC_{10} or NOEC (mg/L)
	A1a: log P_{ow}	A1b: BCF			
0	log <1, log > ca.7 MW > 1000	no measurable BCF	R: readily biodegradable	AT >1000	CT >1
1	1≤ log <2	1≤ BCF <10	NR: not readily biodegradable	100< AT ≤1000	0.1< CT ≤1
2	2≤ log <3	10≤ BCF <100		10< AT ≤100	0.01< CT ≤0.1
3	3≤ log <4	100≤ BCF <500		1< AT ≤10	0.001 < CT ≤0.01
4	4≤ log <5	500≤ BCF <4000		0.1< AT ≤1	CT ≤0.001
5	5≤ log < ca.7	BCF ≥4000		0.01< AT ≤0.1	
6				AT ≤0.01	

	C **Acute Mammalian Toxicity**				
Numerical Rating	C1 Oral Toxicity	C2 Dermal Toxicity	C3 Inhalation Toxicity		
			C3a		C3b
	LD_{50}/ATE (mg/kg)	LD_{50}/ATE (mg/kg)	vapour/mist LC_{50}/ATE (mg/L)	mist only LC_{50}/ATE (mg/L)	vapour only LC_{50}/ATE (mg/L)
0	ATE >2000	ATE >2000	ATE >20	ATE >5	ATE >20
1	300< ATE ≤2000	1000< ATE ≤2000	10< ATE ≤20	1< ATE ≤5	10< ATE ≤20
2	50< ATE ≤300	200< ATE ≤1000	2< ATE ≤10	0.5< ATE ≤1	2< ATE ≤10
3	5< ATE ≤50	50< ATE ≤200	0.5< ATE ≤2	0.05< ATE ≤0.5	0.5< ATE ≤2
4	ATE ≤5	ATE ≤50	ATE ≤0.5	ATE ≤0.05	ATE ≤0.5

	D **Irritation, Corrosion and Long-term Health effects**		
Numerical Rating	D1 Skin irritation and corrosion	D2 Eye irritation and corrosion	D3 Long-term Health effects
0	not irritating	not irritating	**C** – Carcinogenic **M** – Mutagenic **R** – Reprotoxic **Ss** – Sensitizing to skin **Sr** – Sensitizing to respiratory system **A** – Aspiration hazard **T** – Target Organ Toxicity **N** – Neurotoxic **I** – Immunotoxic
1	mildly irritating	mildly irritating	
2	irritating	irritating	
3	severely irritating or corrosive 3A Corr. (≤4 h) 3B Corr. (≤1 h) 3C Corr. (≤3 min)	severely irritating	

	E **Interference with other Uses of the Sea**		
Numerical Rating	E1 Flammability Flashpoint (ºC)	E2 Physical effects on wildlife and benthic habitats	E3 Interference with Coastal Amenities
0	- (not flammable, does not burn)	**Fp** - Persistent Floater **F** - Floater **S** - Sinker **G** - Gas **E** - Evaporator **D** - Dissolver and combinations thereof	no interference ***no warning***
1	Fp >93		slightly objectionable ***warning, no closure of amenity***
2	60< Fp ≤93		moderately objectionable ***possible closure of amenity***
3	23≤ Fp ≤60		highly objectionable ***closure of amenity***
4	Fp <23		

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ANNEX 5

DRAFT ASSEMBLY RESOLUTION

PROCEDURES FOR PORT STATE CONTROL, 2021

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention on the International Maritime Organization regarding the functions of the Assembly in relation to regulations and guidelines concerning maritime safety and the prevention and control of marine pollution from ships,

RECALLING ALSO resolution A.1138(31), by which it adopted *Procedures for port State control, 2019 (*hereafter referred to as the "Procedures"*),* following successive revocation of resolutions A.1119(30), A.1052(27), A.882(21), A.787(19), A.742(18), A.597(15) and A.466(XII),

RECOGNIZING that efforts by port States have greatly contributed to enhanced maritime safety and security, and prevention of marine pollution,

RECOGNIZING ALSO the need to update the Procedures to take account of the amendments to IMO instruments which have entered into force or have become effective since the adoption of resolution A.1138(31),

HAVING CONSIDERED the recommendations made by the Maritime Safety Committee, at its 104th session, and the Marine Environment Protection Committee, at its seventy-seventh session,

1 ADOPTS the *Procedures for port State control, 2021*, as set out in the annex to the present resolution;

2 INVITES Governments, when exercising port State control, to implement the aforementioned Procedures;

3 REQUESTS the Maritime Safety Committee and the Marine Environment Protection Committee to keep the Procedures under review and to amend them as necessary;

4 REVOKES resolutions A.1138(31) and MEPC.321(74).

ANNEX

PROCEDURES FOR PORT STATE CONTROL, 2021

(see MSC 104/18/Add.1, annex 30)

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ANNEX 6

DRAFT ASSEMBLY RESOLUTION

SURVEY GUIDELINES UNDER THE HARMONIZED SYSTEM OF SURVEY AND CERTIFICATION (HSSC), 2021

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines regarding maritime safety and the prevention and control of marine pollution from ships,

RECALLING ALSO the adoption by:

(a) the International Conference on the Harmonized System of Survey and Certification, 1988 of the Protocol of 1988 relating to the International Convention for the Safety of Life at Sea, 1974 and of the Protocol of 1988 relating to the International Convention on Load Lines, 1966, which, inter alia, introduced the Harmonized System of Survey and Certification (HSSC) in the International Convention for the Safety of Life at Sea, 1974, and the International Convention on Load Lines, 1966, respectively;

(b) resolution MEPC.39(29) on amendments to introduce the HSSC in the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL);

(c) resolution MEPC.132(53) on amendments to introduce the HSSC in MARPOL Annex VI;

(d) the International Conference on Ballast Water Management for Ships of the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004, which included the HSSC in the Convention;

(e) the resolutions below on amendments to introduce the HSSC in:

(i) the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code) (resolutions MEPC.40(29) and MSC.16(58));

(ii) the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) (resolution MSC.17(58));

(iii) the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH Code) (resolutions MEPC.41(29) and MSC.18(58)),

RECALLING FURTHER resolution A.1140(31), by which it adopted the *Survey Guidelines under the Harmonized System of Survey and Certification (HSSC), 2019* (hereafter referred to as the "Survey Guidelines"), following successive revocation of resolutions A.1120(30), A.1104(29), A.1076(28), A.1053(27), A.1020(26), A.997(25), A.948(23) and A.746(18), replacing the guidelines adopted by resolutions A.560(14), MEPC.11(18) and MEPC.25(23),

RECOGNIZING the need for the Survey Guidelines to be further revised to take into account the amendments to the IMO instruments referred to above which have entered into force or become effective since the adoption of resolution A.1140(31),

HAVING CONSIDERED the recommendations made by the Maritime Safety Committee, at its 104th session, and the Marine Environment Protection Committee, at its seventy-seventh session,

1 ADOPTS the *Survey Guidelines under the Harmonized System of Survey and Certification (HSSC), 2021*, as set out in the annex to the present resolution;

2 INVITES Governments carrying out surveys required by relevant IMO instruments to apply the provisions of the annexed Survey Guidelines;

3 REQUESTS the Maritime Safety Committee and the Marine Environment Protection Committee to keep the Survey Guidelines under review and to amend them as necessary;

4 REVOKES resolution A.1140(31).

ANNEX

SURVEY GUIDELINES UNDER THE HARMONIZED SYSTEM OF SURVEY AND CERTIFICATION (HSSC), 2021

(see MSC 104/18/Add.1, annex 31)

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ANNEX 7

DRAFT ASSEMBLY RESOLUTION

2021 NON-EXHAUSTIVE LIST OF OBLIGATIONS UNDER INSTRUMENTS RELEVANT TO THE IMO INSTRUMENTS IMPLEMENTATION CODE (III CODE)

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines regarding maritime safety and the prevention and control of marine pollution from ships,

RECALLING ALSO that, by resolution A.1070(28), it adopted the IMO Instruments Implementation Code (III Code),

RECALLING FURTHER resolution A.1141(31), by which it adopted the *2019 Non-exhaustive list of obligations under instruments relevant to the IMO Instruments Implementation Code (III Code)* (hereafter referred to as the "Non-exhaustive list of obligations") for guidance on the implementation and enforcement of IMO instruments, in particular including the identification of auditable areas relevant to the IMO Member State Audit Scheme, as provided in mandatory provisions of relevant IMO instruments, following successive revocation of resolutions A.1121(30), A.1105(29) and A.1077(28),

RECOGNIZING the need for the annexes to the Non-exhaustive list of obligations to be further revised to take account of the amendments to the IMO instruments relevant to the III Code which have entered into force or become effective since the adoption of resolution A.1141(31),

RECOGNIZING ALSO that parties to the relevant international conventions have, as part of the ratification process, agreed to fully meet their responsibilities and to discharge their obligations under the conventions and other instruments to which they are party,

REAFFIRMING that it is the primary responsibility of States to have in place an adequate and effective system to exercise control over ships entitled to fly their flag and to ensure that they comply with relevant international rules and regulations in respect of maritime safety, security and protection of the marine environment,

REAFFIRMING ALSO that States, in their capacity as flag, port and coastal States, have other obligations and responsibilities under applicable international law in respect of maritime safety, security and protection of the marine environment,

NOTING that, while States may gain certain benefits by becoming party to instruments aimed at promoting maritime safety, security and protection of the marine environment, these benefits can be fully realized only when all parties carry out their obligations as required by the instruments concerned,

NOTING ALSO that the ultimate effectiveness of any instrument depends, inter alia, upon all States:

(a) becoming party to all instruments related to maritime safety, security and pollution prevention and control;

(b) implementing and enforcing such instruments fully and effectively;

(c) reporting to the Organization as required,

RECALLING that, by resolutions A.1083(28), A.1084(28) and A.1085(28), it adopted amendments to the International Convention on Load Lines, 1966, the International Convention on Tonnage Measurement of Ships, 1969, and the Convention on the International Regulations for Preventing Collisions at Sea, 1972, to make the use of the III Code mandatory under these conventions,

NOTING that the Maritime Safety Committee, by resolutions MSC.366(93), MSC.373(93), MSC.374(93) and MSC.375(93), adopted amendments to the International Convention for the Safety of Life at Sea, 1974, the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, the Seafarers' Training, Certification and Watchkeeping (STCW) Code, and the Protocol of 1988 relating to the International Convention on Load Lines, 1966, respectively, to make the use of the III Code mandatory under these instruments,

NOTING ALSO that the Marine Environment Protection Committee, by resolutions MEPC.246(66) and MEPC.247(66), adopted amendments to the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, and 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, respectively, to make the use of the III Code mandatory under these instruments,

HAVING CONSIDERED the recommendations made by the Maritime Safety Committee, at its 104th session, and the Marine Environment Protection Committee, at its seventy-seventh session,

1 ADOPTS the *2021 Non-exhaustive list of obligations under instruments relevant to the IMO Instruments Implementation Code (III Code)*, as set out in the annex to the present resolution;

2 URGES Governments of all States, in their capacity as flag, port and coastal States, to make use of the List as much as possible in implementing IMO instruments on a national basis;

3 REQUESTS the Maritime Safety Committee and the Marine Environment Protection Committee to keep the List under review and to amend it as necessary;

4 REVOKES resolution A.1141(31).

ANNEX

2021 NON-EXHAUSTIVE LIST OF OBLIGATIONS UNDER INSTRUMENTS RELEVANT TO THE IMO INSTRUMENTS IMPLEMENTATION CODE (III CODE)

(see MSC 104/18/Add.1, annex 32)

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ANNEX 8

DRAFT AMENDMENTS TO THE IBC CODE

(Watertight doors)

CHAPTER 2

SHIP SURVIVAL CAPABILITY AND LOCATION OF CARGO TANKS

1 Paragraph 2.9.2.1 is replaced by the following:

".1 the waterline, taking into account sinkage, heel and trim, shall be below the lower edge of any opening through which progressive flooding or downflooding may take place. Such openings shall include air pipes and openings which are closed by means of weathertight doors or hatch covers and may exclude those openings closed by means of watertight manhole covers and watertight flush scuttles, small watertight cargo tank hatch covers which maintain the high integrity of the deck, remotely operated sliding watertight doors, hinged watertight access doors with open/closed indication locally and at the navigation bridge, of the quick-acting or single-action type that are normally closed at sea, hinged watertight doors that are permanently closed at sea, and sidescuttles of the non-opening type;"

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ANNEX 9

DRAFT AMENDMENTS TO MARPOL ANNEX I

(Watertight doors)

CHAPTER 4 – REQUIREMENTS FOR THE CARGO AREA OF OIL TANKERS

PART A – CONSTRUCTION

Regulation 28 – Subdivision and damage stability

1 Paragraph 3.1 is replaced by the following:

".1 The final waterline, taking into account sinkage, heel and trim, shall be below the lower edge of any opening through which progressive flooding may take place. Such openings shall include air-pipes and those which are closed by means of weathertight doors or hatch covers and may exclude those openings closed by means of watertight manhole covers and flush scuttles, small watertight cargo tank hatch covers which maintain the high integrity of the deck, remotely operated sliding watertight doors, hinged watertight access doors with open/closed indication locally and at the navigation bridge, of the quick-acting or single-action type that are normally closed at sea, hinged watertight doors that are permanently closed at sea, and sidescuttles of the non-opening type."

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ANNEX 10

STATUS REPORT OF THE OUTPUTS OF MEPC FOR THE 2020-2021 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. Improve implementation	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	Ongoing	MEPC 75/18, section 12; MEPC 76/15, section 11
1. Improve implementation	1.3	Validated model training courses	Continuous	MSC / MEPC	III / PPR / CCC / SDC / SSE / NCSR	HTW	Ongoing	Ongoing	MEPC 75/18, paras.11.3 to 11.5; MEPC 77/16, para. 5.24
1. Improve implementation	1.4	Analysis of consolidated audit summary reports	Annual	Assembly	MSC / MEPC / LEG / TCC / III	Council	Completed	Completed	MEPC 75/18, paras.11.15 to 11.17; MEPC 77/16, para. 10.22
1. Improve implementation	1.5	Non-exhaustive list of obligations under instruments relevant to the IMO Instruments Implementation Code (III Code)	Annual	MSC / MEPC	III		Completed	Completed	MEPC 75/18, para. 11.11; MEPC 77/16, paras. 10.8 and 10.9
1. Improve implementation	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	Completed	MEPC 75/18, section 12; MEPC 76/15, section 11

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. Improve implementation	1.9	Report on activities within the ITCP related to the OPRC Convention and the OPRC-HNS Protocol	Annual	TCC	MEPC		Completed	Completed	MEPC 75/18, section 12; MEPC 76/15, section 11
1. Improve implementation	1.11	Measures to harmonize port State control (PSC) activities and procedures worldwide	Continuous	MSC / MEPC	HTW / PPR / NCSR	III	Ongoing	Ongoing	MEPC 75/18, paras. 11.10 and 11.11; MEPC 77/16, paras. 10.1 to 10.6
1. Improve implementation	1.12	Review of the 2015 Guidelines for exhaust gas cleaning systems (resolution MEPC.259(68))	2021	MEPC	PPR		In progress	Completed	PPR 7/22, section 11; MEPC 75/18, para. 10.35; MEPC 76/15, para.9.10; MEPC 77/16, paras. 5.5 to 5.7 and annex 1
Note: PPR 7 agreed the draft MEPC resolution. MEPC 75 agreed to defer the consideration of the draft MEPC resolution to MEPC 76 with a view to adoption, thus extending the TCY to 2021. Consideration of the draft MEPC resolution was further deferred by MEPC 76 to MEPC 77. The 2021 EGCS Guidelines were adopted by MEPC 77.									

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. Improve implementation	1.13	Review of mandatory requirements in the SOLAS, MARPOL and Load Line Conventions and the IBC and IGC Codes regarding watertight doors on cargo ships	2022	MSC / MEPC	CCC	SDC	In progress	In progress	MSC 102/24, para. 17.28; MSC 103/21, paras. 3.19 and 3.33; MEPC 77/16, paras. 10.16 to 10.21 and annexes 8 and 9.
Note: MSC 104 adopted amendments to the 1988 Load Line Protocol and the IGC Code (MSC 104/18, paragraphs 3.19 to 3.21). MEPC 77 approved similar draft amendments to MARPOL Annex I and the IBC Code with a view to adoption at MEPC 78. The draft amendments to the IBC Code will also be considered for adoption by MSC 106. Therefore, the TCY has been extended from 2021 to 2022.									
1. Improve implementation	1.14	Revised guidance on ballast water sampling and analysis	2021	MEPC	PPR		Completed		MEPC 74/18, para. 4.36; PPR 7/22, section 5; and MEPC 75/18, paras. 10.27 to 10.28
1. Improve implementation	1.15	Revised guidance on methodologies that may be used for enumerating viable organisms	2022	MEPC	PPR		In progress	Extended	MEPC 74/17, para. 14.25; PPR 7/22, section 5; and MEPC 75.18, para 14.2.2; MEPC 76/15, para.12.6
Note: MEPC 75 approved a reduced provisional agenda for PPR 8 that did not include output 1.15. MEPC 76 agreed to extend the TCY from 2021 to 2022.									

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. Improve implementation	1.17	Development of guidelines for onboard sampling of fuel oil not in-use by the ship	2020	MEPC	PPR		Completed		MEPC 74/18, paras. 5.57 to 5.59; PPR 7/22, section 9; and MEPC 75/18, paras. 10.22 to 10.24
Note: PPR 7 agreed to change the title of the Guidelines to "Guidelines for onboard sampling of fuel oil intended to be used or carried for use on board a ship" (PPR 7/22, para. 9.8), which was further approved by MEPC 75. The *2020 Guidelines for onboard sampling of fuel oil intended to be used or carried for use on board a ship* have been issued as MEPC.1/Circ.889.									
1. Improve implementation	1.18	Measures to ensure quality of fuel oil for use on board ships	2021	MEPC			In progress	Completed	MEPC 74/18, section 5; and MEPC 75/18, section 5; MEPC 76/15, section 5
1. Improve implementation	1.21	Review of the 2011 Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species (resolution MEPC.207(62))	2023	MEPC	PPR		In progress	Extended	MEPC 72/17, para. 15.8; and PPR 7/22, section 7; PPR 8/13, section 4; MEPC 76/15, para.12.6
Note: MEPC 76 approved the request by PPR 8 to extend the TCY to 2023.									

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. Improve implementation	1.23	Evaluation and harmonization of rules and guidance on the discharge of liquid effluents from EGCS into waters, including conditions and areas	2022	MEPC			In progress	Extended	MEPC 74/18, para. 14.11; PPR 7/22, section 12; and MEPC 75/18, para.10.35; MEPC 76/15, para.9.10.2; MEPC 77/16, para. 5.14
Note: PPR 7 agreed to revise the title to "Evaluation and harmonization of rules and guidance on the discharge of discharge water from EGCS into the aquatic environment", subject to approval by MEPC 76 (PPR 7/22, paras. 12.12 and 22.21). Due to time constraints, MEPC 76 agreed to defer the consideration of the scope of work agreed by PPR 7 and the modified title for output 1.23 to MEPC 77. MEPC 77 agreed to the title and the scope of work with the TCY of 2022.									
1. Improve implementation	1.24	Review of the BWM Convention based on data gathered in the experience-building phase	2023	MEPC			In progress	In progress	MEPC 74/18, paras. 4.2 to 4.6 and 4.52; MEPC 76/15 section 4; MEPC 77/16, paras. 4.15 to 4.18
1. Improve implementation	1.25	Urgent measures emanating from issues identified during the experience-building phase of the BWM Convention	2023	MEPC			In progress	In progress	MEPC 74/18, paras. 4.27 and 4.60; and MEPC 75/18, para.4.19; MEPC 76/15 para.4.8; MEPC 77/16, paras. 4.15 to 4.18

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. Improve implementation	1.26	Revision of MARPOL Annex IV and associated guidelines to introduce provisions for record-keeping and measures to confirm the lifetime performance of sewage treatment plants	2023	MEPC	III / HTW	PPR	In progress	Extended	MEPC 74/18, paras 14.2 to 14.7; and PPR 7/22, section 16; PPR 8/13, section 7; MEPC76/14, para. 12.6
Note: MEPC 76 approved the request by PPR 8 to extend the TCY to 2023.									
1. Improve implementation	1.33	Development of training provisions for seafarers related to the BWM Convention	2022	MEPC	HTW		In progress	Extended	MEPC 73/19, para. 15.10.1; HTW 7/16, para.12.2
Note: Target completion year extended to 2022 as a consequence of the postponement of HTW 7 and its planned arrangements.									
1. Improve implementation	1.35	Review the Model Agreement for the authorization of recognized organizations acting on behalf of the Administration	2021	MSC / MEPC	III		In progress	Completed	MSC 102/24, paras. 14.8, 21.2 and 21.3 (new output relocated); MEPC 75/18, paras. 11.12 and 11.14; MEPC 77/16, paras. 10.10 to 10.13

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. Improve implementation	1.36	Development of an operational guide on the response to spills of Hazardous and Noxious Substances (HNS)	2022	MEPC	PPR		In progress	In progress	MEPC 74/18, para. 14.20 and MEPC 75/18, paras. 14.1 and 14.2.2; MEPC 76/15, para.12.6
Note: MEPC 75 had agreed to move the above output from the post-biennial agenda of MEPC to the biennial agenda of PPR with a TCY of 2022, as requested by PPR 7. However, MEPC 75 approved a reduced provisional agenda for PPR 8, which does not include this output. Consequently, PPR 8 had agreed to consider including the output in its provisional agenda for PPR 9 and adjust the target completion year accordingly, which was approved by MEPC 76.									
2. Integrate new 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			Completed	Completed	MEPC 75/18, section 4; MEPC 76/15, section 4; MEPC 77/16, section 4
2. Integrate new and advancing technologies in the regulatory framework	2.13	Review of the IBTS Guidelines and amendments to the IOPP Certificate and Oil Record Book	2023	MEPC	PPR		Postponed	Extended	MEPC 74/18, par. 14.25; PPR 7/22, section 16; and MEPC 75/18, para. 10.35; MEPC 76/15, para.9.10.4; MEPC77/16, paras. 9.1 and 9.2
Note: MEPC 75 agreed to defer consideration of the two draft MEPC circulars and the draft amendments (PPR 7/22/Add.1, annexes 13, 14 and 15) to MEPC 76, thus the TCY being extended to 2021. MEPC 76 deferred this to MEPC 77 for consideration. Subsequently, MEPC 77 deferred consideration of the matter to MEPC 78, thus the TCY being extended to 2023.									

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 and advancing technologies in the regulatory framework	2.14	Amendments to regulation 14 of MARPOL Annex VI to require a dedicated sampling point for fuel oil	2020	MEPC			Completed		MEPC 75/18, sections 3 and 5
2. Integrate new 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	2023	MEPC	PPR		In progress	Extended	PPR 7/22, section 13; and MEPC 75/18, para 14.2.2; MEPC 76/15, para.12.6
Note: MEPC 76 approved the biennial status report of the PPR Sub-Committee the provisional agenda of PPR 9, thus extending the TCY from 2021 to 2023.									
2. Integrate new and advancing technologies in the regulatory framework	2.17	Consideration of development of goal-based ship construction standards for all ship types	2023	MSC / MEPC			No work requested by MSC	No work requested by MSC	MSC 102/24, section 7; MSC 104/18/Add.1, annex 35
2. Integrate new and advancing technologies in the regulatory framework	2.18	Standards for shipboard gasification of waste systems and associated amendments to regulation 16 of MARPOL Annex VI	2023	MEPC	PPR		Extended	Extended	MEPC 72/17, para. 15; PPR 7/22, section 10; and MEPC 75/18, para. 14.1; MEPC 76/15, para.12.6
Note: MEPC 75 agreed to extend the TCY of output 2.18 from 2020 to 2021, as requested by PPR 7. MEPC 76 approved the biennial status report of the PPR Sub-Committee and the provisional agenda of PPR 9, thus further extending the TCY to 2023.									

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 and advancing technologies in the regulatory framework	2.19	Amendment of Annex 1 to the AFS Convention to include controls on cybutryne, and consequential revision of relevant guidelines	2022	MEPC	PPR		Extended	Extended	MEPC 73/19, paras. 15.12 to 15.15; PPR 6/20, section 6; MEPC 74/18, paras. 10.19 and 10.20; PPR 7/22, section 6; and MEPC 75/18, paras. 10.14 to 10.21 and 14.1; MEPC 76/15, para.12.6
Note: MEPC 75 agreed to extend the target completion year of output 2.19 to 2022 and approve the change of title of the output to "Revision of guidelines associated with the AFS Convention as a consequence of the introduction of controls on cybutryne", as requested by PPR 7.									
3. Respond to climate change	3.1	Treatment of ozone-depleting substances used by ships	Annual	MEPC			Completed	Completed	MEPC 74/18, paras. 5.75 and 5.76
3. Respond to climate change	3.2	Further development of mechanisms needed to achieve the limitation or reduction of CO2 emissions from international shipping	Annual	MEPC			Completed	Completed	MEPC 74/18, sections 6 and 7; MEPC 75/18, sections 6 and 7; MEPC 76/15, sections 6 and 7; MEPC 77/16, sections 6 and 7

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	3.3	Reduction of the impact on the Arctic of emissions of Black Carbon from international shipping	2023	MEPC	PPR		In progress	In progress	MEPC 71/17, para. 5.3; PPR 5/24, section 7 and para. 24.2.7; MEPC 73/19, para. 5.3; PPR 6/20, section 7; MEPC 74/18, para. 5.67; PPR 7/22, section 8; MEPC 75/18, para. 10.35; MEPC 76/15, para.9.10.3; MEPC 77/16, paras. 9.4 to 9.18
Note: MEPC 76 approved the biennial status report of the PPR Sub-Committee and the provisional agenda of PPR 9, thus extending the TCY from 2021 to 2023.									
3. Respond to climate change	3.4	Promotion of technical cooperation and transfer of technology relating to the improvement of energy efficiency of ships	2023	MEPC			In progress	Extended	MEPC 74/18, sections 7 and 12; and MEPC 75/18, sections 7 and 12; MEPC 76/15, sections 7 and 11; MEPC 77/16, section 7
Note: As the Committee reviews the issue on a regular basis, this item is quasi-continuous output and the TCY is extended from 2021 to 2023.									

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	3.5	Revision of guidelines concerning EEDI and SEEMP	2023	MEPC			In progress	Extended	MEPC 75/18, sections 6 and 7; MEPC 76/15, sections 6 and 7; MEPC 77/16, sections 6 and 7
Note: As the Committee reviews the issue on a regular basis, this item is quasi-continuous output and the TCY is extended from 2021 to 2023.									
3. Respond to climate change	3.6	EEDI reviews required under regulation 21.6 of MARPOL Annex VI	2023	MEPC			In progress	Extended	MEPC 75/18, section 3 and para. 6.4; MEPC 76/15, section 6; MEPC 77/16, sections 6 and 7
Note: The TCY is set to 2023 in accordance with MARPOL Annex VI, regulation 21.6.									
3. Respond to climate change	3.7	Further technical and operational measures for enhancing the energy efficiency of international shipping	2023	MEPC			In progress	Extended	MEPC 75/18, sections 3 and 6; MEPC 76/15, sections 3 and 6; MEPC 77/16, section 6
Note: As the Committee reviews the issue on a regular basis, this item is quasi-continuous output and the TCY is extended from 2021 to 2023.									
4. Engage in ocean governance	4.1	Identification and protection of Special Areas, ECAs and PSSAs	Continuous	MEPC	NCSR		Ongoing	Ongoing	MEPC 75/18, section 9; MEPC 77/16, 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
4. 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	Ongoing	MEPC 75/18, section 12; MEPC 76/15, section 11
4. Engage in ocean governance	4.3	Follow-up work emanating from the Action Plan to Address Marine Plastic Litter from Ships	2023	MEPC	PPR / III / HTW		In progress	In progress	MEPC 73/19, section 8 and annex 10; MEPC 74/18, paragraph 8.37.1; PPR 7/22, section 17; MEPC 75/18, section 8; PPR 8/13, section 8; MEPC 76/15, para.12.6; MEPC 77/16, section 8
Note: In line with the completion time frame (2025) of the Action Plan to Address Marine Plastic Litter from Ships, the TCY has been adjusted to 2023.									
6. Ensure regulatory effectiveness	6.1	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	Ongoing	PPR 7/22 section 18; MEPC 75/18, paras. 10.34 and 10.35; MEPC 76/15, paras. 4.5, 5.23 and 9.5; MEPC 77/16, paras. 4.7, 4.23, 4.24 and 7.5

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
6. Ensure regulatory effectiveness	6.3	Safety and pollution hazards of chemicals and preparation of consequential amendments to the IBC Code	Continuous	MEPC	PPR		Ongoing	Ongoing	PPR 7/22, section 3; and MEPC 75/18, paras.10.3 to 10.12; MEPC 76/15, paras.9.7 and 9.8
6. Ensure regulatory effectiveness	6.4	Lessons learned and safety issues identified from the analysis of marine safety investigation reports	Annual	MSC / MEPC	III		Completed	Completed	III 6/15, section 4; III 7/17, section 4
6. Ensure regulatory effectiveness	6.5	Identified issues relating to the implementation of IMO instruments from the analysis of PSC data	Annual	MSC / MEPC	III		Completed	Completed	III 6/15, section 6; III 7/17, section 6
6. Ensure regulatory effectiveness	6.7	Consideration and analysis of reports on alleged inadequacy of port reception facilities	Annual	MEPC	III		Completed	Completed	III 6/15, section 3; III 7/17, section 3
6. Ensure regulatory effectiveness	6.8	Monitoring the worldwide average sulphur content of fuel oils supplied for use on board ships	Annual	MEPC			Completed	Completed	MEPC 74/18, paras. 5.52 to 5.56; and MEPC 75/18, paras. 5.1 to 5.5; MEPC 77/16, para. 5.24

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
6. Ensure regulatory effectiveness	6.11	Development of measures to reduce risks of use and carriage of heavy fuel oil as fuel by ships in Arctic waters	2022	PPR			In progress	Extended	MEPC 74/18, paragraphs 10.22 to 10.25; PPR 7/22, section 14; and MEPC 75/18, paras. 10.29 to 10.33 and 14.1; MEPC 76/15, section 3
Note: MEPC 76 adopted the amendments to MARPOL Annex I (prohibition on the use and carriage for use as fuel of heavy fuel oil by ships in Arctic Waters) while relevant guidelines have not yet been finalized. MEPC 76 approved the biennial status report of the PPR Sub-Committee and the provisional agenda of PPR 9, thus extending the TCY to 2022.									
6. Ensure regulatory effectiveness	6.15	Role of the human element	Continuous	MSC / MEPC	III / PPR / CCC / SDC / SSE / NCSR	HTW	No work requested	No work requested	
6. Ensure regulatory effectiveness	6.30	Updated Survey Guidelines under the Harmonized System of Survey and Certification (HSSC)	Annual	MSC / MEPC	III		Completed	Completed	III 6/15, section 8; and MEPC 75/18, paras. 10.26, 11.11 and 11.19; MEPC 77/16, para. 10.7
6. Ensure regulatory effectiveness	6.31	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	No work requested	No work requested	CCC 6/14, section 9; MSC 102/24, paras.21.2 and 21.3
Note: The above output had the number OW 19. However, MSC 102 agreed to relocate it to strategic direction 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
7. Ensure organizational effectiveness	7.1	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	Ongoing	MEPC 75/18, para. 16.7; MEPC 76/15, paras.6.6 to 6.11; MEPC 77/16, section 5 and para. 14.3
7. Ensure organizational effectiveness	7.3	Analysis and consideration of reports on partnership arrangements for, and implementation of, environmental programmes	Annual	TCC	MEPC		Completed	Completed	MEPC 75/18, section 12; MEPC 76/15, section 11
7. Ensure organizational effectiveness	7.9	Revised documents on organization and method of work, as appropriate	2023	Council	MSC / FAL / LEG / TCC / MEPC		In progress	Extended	MEPC 75/18, section 15; MEPC 77/16, section 12
Note: As the Committee reviews the issue on a regular basis, this item is quasi-continuous output and the TCY is extended from 2021 to 2023.									
OW. Other work	OW.13	Endorsed proposals for new outputs for the 2020-2021 biennium as accepted by the Committees	Annual	Council	MSC / MEPC / FAL / LEG / TCC		Postponed	Completed	MEPC 75/18, section 14.11; MEPC 76/15, section 12.1 to 12.5; MEPC 77/16, paras. 11.1 to 11.10

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.23	Cooperate with the United Nations on matters of mutual interest, as well as provide relevant input/guidance	2023	Assembly	MSC / MEPC / FAL / LEG / TCC	Council	In progress	Extended	MEPC 75/18, paras.7.3, 7.4 and 8.1; MEPC 76/15, paras.7.5 and 8.1; MEPC 77/16, paras. 7.14 to 7.16 and 8.9 to 8.15
Note: As the Committee reviews the issue on a regular basis, this item is quasi-continuous output and the TCY is extended from 2021 to 2023.									
OW. Other work	OW.24	Cooperate with other international bodies on matters of mutual interest, as well as provide relevant input/guidance	2023	Assembly	MSC / MEPC / FAL / LEG / TCC	Council	In progress	Extended	MEPC 75/18, sections 7 and12; MEPC 76/15, sections 7 and 11; MEPC 77/16, sections 7 and 8
Note: As the Committee reviews the issue on a regular basis, this item is quasi-continuous output and the TCY is extended from 2021 to 2023.									

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ANNEX 11

PROPOSED OUTPUTS OF MEPC FOR THE 2022-2023 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
1. Improve implementation	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	
1. Improve implementation	1.4	Analysis of consolidated audit summary reports	Annual	Assembly	MSC / MEPC / LEG / TCC / III	Council
1. Improve implementation	1.5	Non-exhaustive list of obligations under instruments relevant to the IMO Instruments Implementation Code (III Code)	Annual	MSC / MEPC	III	
1. Improve implementation	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	
1. Improve implementation	1.9	Report on activities within the ITCP related to the OPRC Convention and the OPRC-HNS Protocol	Annual	TCC	MEPC	
1. Improve implementation	1.11	Measures to harmonize port State control (PSC) activities and procedures worldwide	Continuous	MSC / MEPC	HTW / PPR / NCSR	III
1. Improve implementation	1.12	Review of mandatory requirements in the SOLAS, MARPOL and Load Line Conventions and the IBC and IGC Codes regarding watertight doors on cargo ships	2022	MSC / MEPC	CCC	SDC
1. Improve implementation	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	2023	MSC / MEPC	III	
1. Improve implementation	1.15	Revised guidance on methodologies that may be used for enumerating viable organisms	2022	MEPC	PPR	

MARINE ENVIRONMENT PROTECTION COMMITTEE (MEPC)						
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ
1. Improve implementation	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	2023	MEPC	SDC	
1. Improve implementation	1.19	Review of the 2011 Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species (resolution MEPC.207(62))	2023	MEPC	PPR	
1. Improve implementation	1.20	Evaluation and harmonization of rules and guidance on the discharge of discharge water from EGCS into the aquatic environment, including conditions and areas	2022	MEPC	PPR	
1. Improve implementation	1.21	Review of the BWM Convention based on data gathered in the experience-building phase	2023	MEPC		
1. Improve implementation	1.22	Urgent measures emanating from issues identified during the experience-building phase of the BWM Convention	2023	MEPC		
1. Improve implementation	1.23	Revision of MARPOL Annex IV and associated guidelines to introduce provisions for record-keeping and measures to confirm the lifetime performance of sewage treatment plants	2023	MEPC	III / HTW	PPR
1. Improve implementation	1.29 (New)	Development of guidance on assessments and applications of remote surveys, ISM Code audits and ISPS Code verifications	2024	MSC/ MEPC	III	
1. Improve implementation	1.30 (New)	Review of the 2014 Standard specification for shipboard incinerators (resolution MEPC.244(66)) regarding fire protection requirements for incinerators and waste stowage spaces	2022	MEPC	SSE	
2. Integrate new 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		

MARINE ENVIRONMENT PROTECTION COMMITTEE (MEPC)						
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ
2. Integrate new and advancing technologies in the regulatory framework	2.13	Review of the IBTS Guidelines and amendments to the IOPP Certificate and Oil Record Book	2023	MEPC	PPR	
2. Integrate new 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	2023	MEPC	PPR	
2. Integrate new and advancing technologies in the regulatory framework	2.17	Consideration of development of goal-based ship construction standards for all ship types	2023	MSC / MEPC		
2. Integrate new and advancing technologies in the regulatory framework	2.18	Standards for shipboard gasification of waste systems and associated amendments to regulation 16 of MARPOL Annex VI	2023	MEPC	PPR	
2. Integrate new and advancing technologies in the regulatory framework	2.19	Revision of guidelines associated with the AFS Convention as a consequence of the introduction of controls on cybutryne	2022	MEPC	PPR	
3. Respond to climate change	3.1	Treatment of ozone-depleting substances used by ships	Annual	MEPC		
3. Respond to climate change	3.2	Further development of mechanisms needed to achieve the reduction of GHG emissions from international shipping	Annual	MEPC		

MARINE ENVIRONMENT PROTECTION COMMITTEE (MEPC)						
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ
3. Respond to climate change	3.3	Reduction of the impact on the Arctic of emissions of Black Carbon from international shipping	2023	MEPC	PPR	
3. Respond to climate change	3.4	Promotion of technical cooperation and transfer of technology relating to the reduction of GHG emissions from ships	2023	MEPC		
3. Respond to climate change	3.5	Revision of guidelines concerning Chapter 4 of MARPOL Annex VI	2023	MEPC		
3. Respond to climate change	3.6	EEDI reviews required under regulation 21.6 of MARPOL Annex VI	2023	MEPC		
3. Respond to climate change	3.7	Further technical and operational measures for enhancing the energy efficiency of international shipping	2023	MEPC		
4. Engage in ocean governance	4.1	Identification and protection of Special Areas, ECAs and PSSAs	Continuous	MEPC	NCSR	
4. 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	
4. Engage in ocean governance	4.3	Follow-up work emanating from the Action Plan to Address Marine Plastic Litter from Ships	2023	MEPC	PPR / III / HTW	
6. Address the human element	6.1	Role of the human element	Continuous	MSC / MEPC	III / PPR / CCC / SDC / SSE / NCSR	HTW
6. Address the human element	6.2	Validated model training courses	Continuous	MSC / MEPC	III / PPR / CCC / SDC / SSE / NCSR	HTW
6. Address the human element	6.10	Development of an entrant training manual for PSC personnel	2023	MSC / MEPC	III	

MARINE ENVIRONMENT PROTECTION COMMITTEE (MEPC)						
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ
6. Address the human element	6.11	Development of training provisions for seafarers related to the BWM Convention	2022	MEPC	HTW	
6. Address the human element	6.16	Development of an operational guide on the response to spills of Hazardous and Noxious Substances (HNS)	2022	MEPC	PPR	
7. Ensure regulatory effectiveness	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	
7. Ensure regulatory effectiveness	7.3	Safety and pollution hazards of chemicals and preparation of consequential amendments to the IBC Code	Continuous	MEPC	PPR	
7. Ensure regulatory effectiveness	7.4	Lessons learned and safety issues identified from the analysis of marine safety investigation reports	Annual	MSC / MEPC	III	
7. Ensure regulatory effectiveness	7.5	Identified issues relating to the implementation of IMO instruments from the analysis of PSC data	Annual	MSC / MEPC	III	
7. Ensure regulatory effectiveness	7.7	Consideration and analysis of reports on alleged inadequacy of port reception facilities	Annual	MEPC	III	
7. Ensure regulatory effectiveness	7.8	Monitoring the worldwide average sulphur content of fuel oils supplied for use on board ships	Annual	MEPC		
7. Ensure regulatory effectiveness	7.11	Development of measures to reduce risks of use and carriage of heavy fuel oil as fuel by ships in Arctic waters	2022	PPR		

MARINE ENVIRONMENT PROTECTION COMMITTEE (MEPC)						
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ
7. Ensure regulatory effectiveness	7.16	Development of necessary amendments to MARPOL Annexes I, II, IV, V and VI to allow States with ports in the Arctic region to enter into regional arrangements for port reception facilities (PRFs)	2023	MEPC	PPR	
7. Ensure regulatory effectiveness	7.27	Updated Survey Guidelines under the Harmonized System of Survey and Certification (HSSC)	Annual	MSC / MEPC	III	
7. Ensure regulatory effectiveness	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
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	
8. Ensure organizational effectiveness	8.3	Analysis and consideration of reports on partnership arrangements for, and implementation of, environmental programmes	Annual	TCC	MEPC	
8. Ensure organizational effectiveness	8.9	Revised documents on organization and method of work, as appropriate	2023	Council	MSC / FAL / LEG / TCC / MEPC	
OW. Other work	OW.3	Endorsed proposals for new outputs for the 2022-2023 biennium as accepted by the Committees	Annual	Council	MSC / MEPC / FAL / LEG / TCC	
OW. Other work	OW.8	Cooperate with the United Nations on matters of mutual interest, as well as provide relevant input/guidance	2023	Assembly	MSC / MEPC / FAL / LEG / TCC	Council
OW. Other work	OW.9	Cooperate with other international bodies on matters of mutual interest, as well as provide relevant input/guidance	2023	Assembly	MSC / MEPC / FAL / LEG / TCC	Council

ACCEPTED OUTPUTS ON THE POST-BIENNIAL AGENDA OF MEPC

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, par.14.15
2	2020-2021	7. Ensure regulatory effectiveness (New)	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.	MEPC	PPR		1 session	MEPC 77/16, par. 11.7

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* Biennium when the output was placed on the post-biennial agenda.

ANNEX 12

ITEMS TO BE INCLUDED IN THE AGENDA OF MEPC 78

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	Pollution prevention and response
10	Reports of other sub-committees
11	Identification and protection of Special Areas, ECAs and PSSAs
12	Technical cooperation activities for the protection of the marine environment
13	Application of the Committees' method of work
14	Work programme of the Committee and subsidiary bodies
15	Any other business
16	Consideration of the report of the Committee

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* The numbering may not correspond to the number of the agenda item in the forthcoming session.

ANNEX 13

STATEMENTS BY DELEGATIONS AND OBSERVERS*

ITEM 5

Statement by the observer from CLIA

First statement

"The draft 2021 EGCS guidelines presented for adoption by the Committee reflect hard work by PPR and WG 1 at this session to provide updates to guidance for these systems. Importantly, the Guidelines do at times present very technical provisions that can have significant operational impacts for ships fitted with these systems. Unfortunately, the WG may not always fully appreciate the potential impact of certain text provisions. One example is the WG's decision to not include proposed clarifying text from IACS in section 10.1.7.1 of the draft 2021 Guidelines for discharge water from temporary storage. Many closed-loop systems that utilize temporary storage are set up is to use the open-loop discharge and monitoring system, which is a dynamic system able to change parameter levels based on system flow rate. Without the IACS clarifying markup, the text presented for adoption would limit the parameters to specific levels requiring the addition of specific monitoring systems for those storage tanks. This will impact many ships under construction with hybrid EGCS systems as it would prohibit the use of the open-loop monitoring systems for water that is stored in temporary tanks. CLIA agrees that guidance was needed for this temporarily stored water but seeks the Committee's reconsideration of adding the clarifying text from IACS, specifically "unless such discharge water is mixed and monitored together with open-loop discharge water" to 10.1.7.1 to avoid this unnecessary and costly consequence. Alternatively, CLIA requests that this intervention be reflected in the Report of the Committee."

Second statement

"The text of the draft WG report in paragraphs 27 and 28 makes clear that there was broad support for further using GESAMP to complete their work begun in 2019, and that it was decided not to reactivate them only because it was believed there was not time available for them to complete additional work before PPR9 in April, 2022. The deadline selected precludes completing an important and necessary study from GESAMP to appropriately inform the work of the Committee on this complex issue. We urge the Committee to reconsider the target completion year of 2022 for this work output as reflected in paragraphs 29.1 and 45.3 in order to allow further work by GESAMP. We, too, believe that this work should be timely completed, while also allowing sufficient time for experts to provide the technical information the Committee needs to make informed decisions regarding the operations of approved alternative compliance systems."

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* 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

ITEM 7

PROPOSALS RELATED TO THE 2050 LEVEL OF AMBITION AND THE REVISION OF THE INITIAL IMO GHG STRATEGY

Statement by the delegation of Argentina

"Argentina has internally adopted the net-zero goal for mid-century. Thus, we continue to support the work at IMO.

The Glasgow Pact emphasizes the urgency of improving ambition to keep the objectives of the Paris Agreement alive.

The Glasgow Pact also emphasizes the urgency of scaling up action and support, including financial support, capacity building and technology transfer, to enhance adaptive capacity, strengthen resilience and reduce vulnerability to climate change in accordance with the best available science, taking into account the priorities and needs of developing countries.

It also has acknowledged the important aspect of loss and damage, which probably should have been more concrete.

Like the UNFCCC and the Glasgow Pact, the Initial Strategy is a package of elements, and this is so because it has a mandate derived from the UNFCCC. In addition to the levels of ambition, an important element is the need to duly assess and address negative impacts on developing countries. Developing countries will find a much more challenging scenario in the medium and long term.

We are firmly committed to the review of the Initial Strategy. In that regard, like Brazil, China, India and others, we believe that it is necessary to preserve that conceptual package rather than adopting a pronouncement on only one of those elements. In this way, we also advocate for access to new developments and technology transfer, so that no one is left behind in the transition. The Work plan for the development of medium and long-term measures should be taken into account, which foresees carrying out assessments of the possible impacts on States of the candidate measures in parallel with the consideration and development of medium and long-term measures.

Regarding impacts on States, we will have a review, in the process of lessons learned, of the provisions of the Initial Strategy and of the experience of the impact evaluation of the short-term measure. That should be captured by the review of the Initial Strategy.

We believe it is necessary to address, in the review, the apparent tension between, on the one hand, the principle of non-discrimination + the principle of no more favourable treatment enshrined in MARPOL and other IMO conventions and, on the other, the principle of common but differentiated responsibilities and according to the respective capabilities, in the light of the different national circumstances, enshrined in the UNFCCC, its Kyoto Protocol, the Paris Agreement and the Glasgow Climate Pact. It is necessary to maintain ambition and, at the same time, the commitment to a fair transition, as indicated by Spain and other delegations.

In order to ensure all this, Argentina believes there is no need to adopt a resolution, but we agree to start the process as soon as possible, in order to have important progress that will allow the adoption of the review in 2023. This brings us to document MEPC 77/7/15; we do not believe terms of reference are necessary, as the review must address all elements of the Initial Strategy, and negotiating terms of reference would be tantamount to undertaking the review. But if deemed necessary, paragraph 16 (the proposed "terms of reference") should be

delicately negotiated to preserve that balance of elements that is the package of the Initial Strategy. Also, we agree with Vanuatu with regard to paragraph 12 of that document, concerning the novelty of the expression "full cost-benefit impact assessment".

That said, we agree with a balanced outcome from this Committee, reflecting our unequivocal commitment to review together on all aspects of Initial Strategy."

Statement by the delegation of Belgium

"Belgium thanks submitters of all documents.

Firstly, Belgium generally aligns itself with the intervention from Slovenia.

The IPCC Sixth Assessment Report was clear: action is needed now to peak emissions from all sectors – including shipping – as soon as possible and to reach zero GHG emissions by 2050 in order to keep the 1.5 °C Paris Agreement goal within reach. Therefore, the transition to alternative fuels is needed and a clear pathway is needed from IMO so that industry stakeholders get the certainty they need. We therefore support that the Committee starts the work on the revision of the Initial IMO Strategy as soon as possible, preferably at this session. The process suggested in document MEPC 77/7/15 seems to be a good approach to guide us through the revision. We believe that the level of ambition of the Initial Strategy needs to be increased in order to achieve zero emission shipping by 2050 at the latest, a demand that is also reflected in documents MEPC 77/7/3 and MEPC 77/7/27 and which was also raised in several occasions at the recent COP 26. Furthermore, Belgium believes adopting goals for 2030 and 2040 will give us more certainty to achieve the 2050 target. Furthermore, besides setting clear and ambitious goals, it will be of utmost importance in order to actually reach the intermediate and final goals, to work on the development of a set of ambitious MLTMs. Because of the global nature of both shipping and climate change, we still believe that IMO is the best placed to deal with this and we also believe that IMO needs to send a clear signal now."

Statement by the delegation of Brazil

"I would like to first thank the co- sponsors of the documents analyzed under this agenda item.

Regarding document MEPC 77/7/3, Brazil cannot support having a draft resolution as proposed in its annex decoupled from the Initial Strategy and its revision or even setting at this stage a target for 2050 to amend the current long-term target without taking into account several elements that are missing in the draft resolution, as well pointed out by Argentina and others.

IMO has been sending strong and clear signals to the international community that we are committed to reducing emissions. We approved, together, the Initial Strategy; we approved, together, short-term measures that are on their way to being implemented; and we hope to adopt, together, a revision of the Initial Strategy that is reflective of the efforts that have already been undertaken by this Group and by the industry and that is informed by science and factual data, avoiding hastiness and shallowness in the discussions of such important issues.

In this regard, we cannot support the proposal in document MEPC 77/7/15, given that its recommendations are not backed by scientific observation that such a proposition is in line with the share of the international shipping sector to the temperature goals of the Paris Agreement. We support revising the Initial Strategy, given that this has been agreed by this group, although not in the terms set out in document MEPC 77/7/15 and we support the full statement delivered by Argentina in this regard.

I also recall that any targets must be conceptually clear to all Member States, including regarding their potential consequences. For instance, the idea of a net-zero target, as mentioned by many Parties in this debate and as referred to for example in documents MEPC 77/7/15 and MEPC 77/7/22, is not equal to emissions reductions and will impose the need for offsets to be adopted, which is something that needs to be carefully considered and requires further conceptual clarity.

We need structural change to effectively reduce emissions, including financial and technology transfers, appropriate capacity building and feasibility studies to assess if net-zero, absolute zero or any other long-term targets in 2050 is enough and will produce the outcomes we wish without creating market distortions or additional burden on developing States.

Net-zero, absolute zero or any other absolute targets are not aligned with the targets set out in the UNFCCC or its Paris Agreement. This picks and chooses important elements of the multilateral climate change regime: let us not forget that the same Article that contains the long-term temperature goal of the Paris Agreement is the same Article that also enshrines the need that efforts shall be made taking into account the principle of common but differentiated responsibilities and equity.

Finally, Brazil aligns itself with the comments and shares the same concerns raised by China, India, the Russian Federation, Singapore and others and hopes to contribute to the maturing of the discussion on this agenda item."

Statement by the delegation of China

"The just-concluded COP 26 reached consensus on the implementation of the Paris Agreement and other core issues. The Glasgow Climate Pact reached at the meeting reiterated the goal of temperature control and the principle of CBDR, emphasizing developed countries provide more support to developing countries in terms of funding, technology transfer, capacity building, and loss and damage.

China has been actively and constructively participating in negotiations on various issues throughout COP26. China and the United States jointly issued the Glasgow Joint Declaration, and China submitted a Nationally Determined Contribution report to COP 26. As the world's largest developing country, China will take the shortest time in global history to achieve the transition from carbon peaking to carbon neutrality. China not only set targets, but also put forward specific action plans.

This delegation cannot support the resolution of zero emission target by 2050 proposed in document MEPC 77/7/3. First, the target is not in line with the requirements of the United Nations Framework Convention on Climate Change and its Paris Agreement, as well as the Glasgow Climate Pact, such as "net zero around mid-century", and does not reflect the CBDR principle and principle of fairness; second, it does not mention the mechanisms and measures needed to achieve the target, including funding, technology transfer and capacity building, and it does not conduct feasibility study and lacks scientific basis. This delegation believes when developing any targets or measures, including the revision of the Initial Strategy, this organization needs to take into account the characteristics of the shipping sector and must base on scientific data, especially the data of the shipping industry, to ensure the sustainable development of the shipping industry. At the same time, it should also fully recognize the CBDR principle to ensure that no one is left behind on transition to decarbonization. We support this organization to be the platform for formulating international shipping emission reduction regulations and oppose any regional or national unilateral actions.

Tackling climate change is a common problem faced by all countries in the world, and it is also closely related to the future of mankind. No country or group can accomplish it alone. The Member States of this organization should strengthen mutual understanding and mutual trust, and work together to make due contributions by the shipping industry to the global response to climate change and economic recovery."

Statement by the delegation of Denmark

"The sixth assessment report from IPCC has underscored the need to limit the rise in temperature to 1.5 degrees Celsius. This finding stresses the need for shipping to act now and to reach zero emission by 2050.

We recognize the conclusion in the IPCC report and the urgency in reducing GHG emission. All sectors have to contribute, including shipping.

This is also why the Danish Prime Minister took an initiative to gather political support for a declaration on zero emission shipping in 2050, which was presented during COP 26. The declaration is now signed by 17 countries from four continents and we expect more countries to sign.

We therefore welcome all submissions and initiatives wishing to promote similar levels of ambition for the global shipping sector.

Consequently, and with a view to the upcoming work on the revision of the Initial IMO Strategy by 2023, we believe it is very important that IMO also sends a clear signal that we recognize the need to increase our collective ambition to reach zero emission by 2050.

A clear signal that will demonstrate the Organization's continued commitment to reducing GHG emissions from international shipping in line with science-based evidence."

Statement by the delegation of Germany

"We thank all submitters of documents under this agenda item.

Since the Committee adopted the Initial IMO Strategy in 2018, scientific evidence has underscored the urgency of tackling the climate crisis. Science makes clear that in order to keep the Paris Agreement temperature goal within reach, and to limit temperature rise to 1.5ºC, emissions from all sectors must peak immediately, undergo significant reductions in the 2020s, and reach zero emissions by 2050 at the latest.

We thank the co-sponsors of document MEPC 77/7/18 for bringing the scientific basis for this argument again to the attention of this Committee.

Dear fellow delegates, we all have committed ourselves within the Initial IMO Strategy that reviews should take into account updated emission estimates and in particular the IPCC reports. Now it’s time to do our homework by starting the revision of the Initial Strategy and to pave the way for a timely adoption of a strategy that corresponds with the urgency of the climate crisis and provides us with the necessary tools for the enormous challenges ahead of us…

Germany is fully committed to align international shipping with the 1.5° degrees target and for us it is crystal clear what level of ambition needs to be agreed. That is why Germany is one of the Signatories of the Declaration on Zero Emission Shipping by 2050, presented at COP 26.

In this regard, we also support in general document MEPC 77/7/15 (Costa Rica et al.), and the content objective of document MEPC 77/7/3 (Kiribati et al.).

Now we have to take the next steps and to see how we can translate our climate goals into concrete action. It is clear, that delayed action delays the inevitable. The more time we lose, the steeper and more difficult the cuts become. That is why we need to incentivize near-term action in the 2020s. We need to develop and adopt mid-term measures that enter into force by the middle of this decade, in a way that corresponds with the urgency of the climate crisis. The measures need to finally result in the decarbonization of fuels, in addition to the increasing energy efficiency of ships resulting from the short-term measures, provided that they are adequately strengthened.

Only mandatory measures will put wind in the sails of the many industry initiatives that are presented by document MEPC 77/7/32 by IMarEST. In order to ensure a 1.5ºC aligned pathway to zero emissions in the sector, absolute emission targets for 2030 and 2040 are required to guide us on the level of stringency of these measures. This cannot be postponed until after the revision of the Strategy.

At the same time, we need to develop these measures in a way that avoids negative impacts as far as possible and leaves no country behind.

And let us be honest, all this will only be possible if we roll up our sleeves now and agree on a Work plan for the revision of the Initial Strategy by adopting the scope and terms of reference as proposed by Costa Rica et al. in document MEPC 77/7/15."

Statement by the delegation of India

"This delegation appreciates the well-intended submission from the co-sponsors stressing the need of an overarching resolution, to demonstrate to the world that the Organization is committed to GHG emissions from international maritime transport. However, India feels that such a resolution from a credible organization like IMO, should be achievable, pragmatic, inclusive and more importantly should reflect solutions and roadmap to achieve the goal. Failing which, it will be seen by the world as a hollow political statement, damaging the confidence in this Organization as the global leader for control of emissions from maritime sector.

When we resolute on a sector-wise targeted commitment on decarbonization, we should also appreciate the limitations for an interdependent industry like shipping in achieving the same in a stand-alone framework, without taking on board other stakeholders who fall well beyond the control and mandate of this Organization. Hence any message from this Committee on targeted decarbonization shall be in line with the respective member State commitments at the UNFCC, and taking into cognizance the latest Glasgow Pact of COP 26 in this regard. India therefore suggests that any resolution from this Committee on decarbonization shall clearly reflect the following, in line with Decision 1 of COP26:

.1 Every country will arrive at net-zero emissions as per its own national circumstances, its own strengths and weaknesses. And developing countries have a historical right to their fair share of the global carbon budget and are entitled to the responsible use of fossil fuels within this scope.

.2 Acknowledge the devastating impacts of the COVID-19 pandemic and the importance of ensuring a sustainable, resilient and inclusive global recovery, showing solidarity particularly with developing country Parties.

.3 Should expressly recognize that this level of ambitious target would require accelerated action in this critical decade from the developed country Parties in providing enhanced support, including through financial resources, technology transfer and capacity-building, to assist developing country Parties, in continuation of their existing obligations under the UNFCC, its Paris Agreement and Glasgow Pact as the case may be.

Finally, we conclude with a strong alert to this forum that any number of resolutions with any amount of ambitious targets on global emission control without addressing the genuine concerns of the developing nations who are going to hold the key for emission control of the future world is not going to generate the desired effects. Nor do any regulatory framework or resolutions, without recognizing the genuine rights of the developing nations to strive for better standard of living for their people, will stand the challenges of time."

Statement by the delegation of the Netherlands

"At COP 26 in Glasgow heads of States and world leaders agreed on the need for increased efforts to accelerate climate action.

More and more people (but also economies) worldwide are being impacted by climate change. It's serious, and it calls for serious action.

It was encouraging to notice that shipping received considerable attention at this world summit and this reflects the need for action also expressed by the private sector.

It is important to start the process of the revision of the Strategy as proposed in document MEPC 77/7/15 Costa Rica et al. To progress along the timelines consistent with the Initial Strategy, the revision should be finalized at MEPC 80.

We need to define the issues to be addressed. In addition, we support the idea of dedicating an Intersessional Working Group before the next MEPC to elaborate on this.
The work must occur in parallel with other ongoing work on GHG-related issues, particularly the mid-term measures.

It is the level of ambition that needs to be addressed. Scientific research shows that the total CO_2 emissions from all sectors must peak immediately and be significantly reduced in this decade, to reach at least climate neutrality by 2050.

This level of ambition is also highlighted in document MEPC 77/7/3 (Kiribati et al.).
And although we sympathy with the intentions of this submission, I align myself with the statements of Slovenia and France on this.

In conclusion, the revision of the Initial IMO Strategy should be carried out timely and thoroughly. The levels of ambition for GHG reduction should be set along the pathway to climate neutrality in 2050 as underlined by many States and industry at COP 26 in Glasgow. The work on ambitious mid- and long-term measures must meanwhile continue without delay so that 2030 and 2040 levels form steppingstones to achieve the final goal in 2050."

Statement by the delegation of Saudi Arabia

"Mr. Chair, the Saudi delegation would first like to thank you for your leadership over this week, and we should continue to work in an inclusive manner taking into account all Member States views. As well as congratulate you for your re-election and wish you all the best in this coming round

Mr. Chair, as you all know we have just completed a long round of climate negotiations in Glasgow, and parties have come together and agreed upon the Glasgow Climate Pact and we have all moved forward in a collective manner. It is of the utmost importance for us to be consistent with the Paris Agreement and recent Glasgow Climate Pact.

Mr. Chair, we have been reiterating in the last couple of days that we must align with COP 26 outcome, we must be consistent with Paris Agreement, we should ensure consistency and alignment with terminology used in different forums whenever climate change issues are discussed.

In our Initial IMO Strategy, we have already agreed upon the guiding principles, of which is the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances, enshrined in UNFCCC, its Kyoto Protocol and the Paris Agreement.

We always say that our work must be in light of best available science, the best available science says it is net-zero emissions and it is not zero emissions. And this is according to the latest IPCC reports, 1 of 3 reports of AR6, that are to be completed in 2022.

Mr. Chair, at COP 26, it has been agreed to transition to net-zero emissions by or around mid-century, considering different national circumstances; and this is in line with our work under the auspices of the UNFCCC again this was agreed upon just over a week ago.

With regards to the Paris Agreement temperature goals, we all know what they are, all countries have agreed on them, so we see no harm in including them in the document MEPC 77/J/5, we should not cherry pick from the Paris Agreement, Initial IMO Strategy is in line with goals of the Paris Agreement and includes its principles, all IMO climate and GHG texts should be aligned with the Agreement, which is what guides us towards our efforts in addressing climate change.

Finally, we look to forward to working constructively and in the spirit of collaboration among all members. And we request our statement to be reflected in the document MEPC 77/J/5 and final report."

Statement by the delegation of Slovenia

"This delegation is very much looking forward to working with you, Mr Chair, and all members of this Committee to take important, ambitious and equitable decisions this week to address the climate crisis.

We have already achieved a lot, but we need to step up our efforts. We have a huge workload ahead of us.

Against the backdrop of the climate urgency and the recent COP 26, it is of the utmost importance that this Organization sends a strong signal to the international community, industry and society at large that we are ready, eager and determined to reduce GHG emissions from international shipping in line with the Paris agreement goals.

As demonstrated in the latest IPCC report, all emissions must peak immediately and a zero GHG emissions level must be achieved for all sectors by 2050 at the latest. The decision-making of this Organization is evidence-based and the evidence is there.

It is an absolute necessity for this Organization to launch the revision of the Initial Strategy and to revise the levels of ambition upwards, as suggested by the distinguished delegation of Costa Rica and co-sponsors of document MEPC 77/7/15. Therefore, this Committee should initiate the revision of the Initial Strategy with a focus on strengthening – within this process – the levels of ambition for emission reductions for 2030 and 2050 and to achieve climate neutrality by 2050 at the latest.

It is, as I already stated, also necessary to send a strong signal that IMO is committed to a rapid reduction of GHG emissions.

In that context, we are judged by our actions, not by our words. We see merits in, and have a lot of sympathy for, the aims of the resolution proposed by the distinguished delegations of Kiribati, Marshall Islands and Solomon Islands in document MEPC 77/7/3.

However, we have very limited time available at this session. Our concern is that such a discussion might lead to a diversion of the discussion from the concrete proposals for mid- and long-term measures, which would result in actual emission reductions – the result we all want to achieve. Therefore, we believe it is preferable to focus our efforts on concrete proposals rather than a resolution, at least at this stage. Otherwise, we might be perceived as producing words instead of taking action."

Statement by the delegation of Spain

"First of all, we would like to thank all the delegations that have presented documents under this agenda item.

Spain is committed to multilateral climate action in IMO as the appropriate forum for achieving global solutions that unlock the benefits of action and model change while reducing inequalities.

In this regard, we support the need to send a clear signal on the continued commitment of the Organization to reduce GHG emissions from international shipping in line with the objectives of the Paris Agreement and the conclusions reached at COP 26 regarding the acceleration of mitigation actions.

Such a signal of commitment should also allow us time to consider concrete proposals for medium/long-term measures that will result in real emission reductions as soon as possible.

We therefore prefer that such a commitment is not reflected at this stage in the form of a resolution.

We would like to take this opportunity to express Spain's clear and firm commitment to the objective of reducing emissions from maritime transport, and in this regard, we support the objective of zero emissions in maritime transport by 2050.

Spain is also committed to a sustainable and just ecological transition that takes into account developing countries.

We therefore urge the Committee to initiate the review of the Initial IMO Strategy as soon as possible, focusing on the need to strengthen the ambition to reduce emissions by 2030 and 2050 and to achieve climate neutrality by 2050 at the latest, while taking into account the needs of those Member States facing ecological transition constraints."

Statement by the delegation of Tonga

"The Marshall Islands and the Solomon Islands supported by other delegations stated that the current regulations in MARPOL Annex VI concerning reduction of GHG emissions from ships alone are insufficient to reduce GHG emissions to achieve the Paris Agreement temperature goals. Noting the IPCC analysis of anthropogenic global warming due to past and ongoing emissions, and in light of the present trends described in the IPCC reports, we recognize that international shipping reaching zero GHG emissions by 2050 is essential to keep the Paris Agreement temperature goals within reach."

The delegation of Tonga expresses its appreciation to the support provided during the session by a number of delegations which names are listed in the report."

Statement by the delegation of Vanuatu

"We would like to thank all submitters of documents relevant to proposals related to the 2050 level of ambitions and the revision of the Initial IMO Strategy.

Vanuatu is fully supportive of the ambition for international shipping to reach net-zero GHG emissions by 2050 to meet the Paris Agreement targets and contribute to the preservation of our country, our region of the effect of climate change and as such Vanuatu is among these 50 States which have signed the Dhaka – Glasgow Declaration.

We therefore support the proposed draft resolution contained in document MEPC 77/7/3 the content of which should also be considered upon the revision of the Initial IMO Strategy. Vanuatu supports the adoption of said proposed draft resolution which does stress the need to adopt urgent measures to address international shipping GHG emissions reductions which will depend upon technology availability, the need to avoid distortion on international shipping which remains indispensable to the world as well as disproportionate negative impacts on SIDS and LDCs particularly which are the most vulnerable. Perhaps these elements could be inserted in the proposed draft resolution to address some previous speakers concerns to adopt this draft resolution at this session.

When it comes to the revision of the Initial IMO Strategy, we welcome document MEPC 77/7/15 which offers good grounds for initiating the work. However, we wish to draw the attention of the Committee that paragraph 12 of said document does address the impact on States which is of great importance to this delegation. We note that it is proposed to take into account the impacts of inaction which while we agree with the concept should not at any time jeopardize consideration of the disproportionate negative impacts such IMO GHG reduction measures may have on SIDS which are highly vulnerable. Besides, we strongly believe that "disproportionate negative impact" should be defined in said Strategy to ensure a common understanding of what said disproportionate negative impacts are and avoid further misunderstanding between Member States at the time of assessing said impacts as it was the case at the time of the assessment of short-term measures during MEPC 76.

Last but not least, we believe the review of the Initial Strategy should be holistic and may not require ToR as reflected in document MEPC 77/7/15, paragraph 16."

Statement by the observer from ICS

"As made clear in document MEPC 77/7/22, ICS fully supports the adoption of a net-zero target for 2050, but only provided that IMO takes the necessary actions to make such an ambitious target plausible.

As well as mid- and long-term measures, as an immediate step this means increasing Technology Readiness Levels by 2030, which will be dependent on whether or not IMO establishes the IMRF.

We welcome the ideas set out by Costa Rica et al. in document MEPC 77/7/15, but ICS is cautious about establishing absolute reduction targets for 2030 and 2040, as this could have unintended consequences, such as encouraging the uptake of fuels which will allow the sector to achieve the next intermediate target, rather than focusing on the development and deployment of those zero-carbon fuels and technologies that will be required to get to zero by 2050.

The concept of setting anything more than aspirational goals for the proportion of the fleet using zero-carbon fuels also requires careful consideration: how would this percentage be defined and how might it apply to different ship types, sizes, or company fleets? The achievement of such a goal would also be in the control of stakeholders which are not directly regulated by IMO.

To repeat, when the Initial Strategy is revised, any new targets will have to be plausible and credible. Above all else, this will depend on whether there is confidence that Technology Readiness Levels are likely to increase sufficiently by 2030, which is why it is vital that the IMRF is approved by the Committee at this session."

Statement by the observer from INTERCARGO

"Given the harsh realities and the tremendous challenges of decarbonization and of the associated energy transition, from technological, economic, and societal points of view, INTERCARGO fully supports the drive and the ambition to achieve zero emission shipping by 2050.

However, shipowners will only deliver such a target with a drastic and urgently needed acceleration in the commercial development of the required technologies, fuels, propulsion systems and related infrastructure.

This Committee is the place for Member States to take action and adopt the necessary measures:

.1 In the short term, an immediate priority is the approval of the industry proposal for the "Establishment of an International Maritime Research and Development Board and an IMO Maritime Research Fund" – see document MEPC 77/7/6 co-sponsored by INTERCARGO.

.2 INTERCARGO has also, jointly with ICS, put forward a proposal for a global levy on carbon emissions from ships as a medium-term market based measure, in order to accelerate the uptake and deployment of zero-carbon technologies and fuels as soon as possible – see document ISWG-GHG 10/5/2.

In conclusion, INTERCARGO supports IMO in meeting the shared, global challenge of delivering on the shipping industry's decarbonization agenda and, in representing the dry bulk ship owners, managers and operators, invites this Committee to take action as appropriate."

Statement by the observer from CSC

"CSC would like to make a few observations about where we are and what needs to happen now. This was certainly made easier by yesterday's UNFCCC intervention which clearly and simply articulated the importance of this "critical decade" and explained how we are now all of us full square behind keeping warming below 1.5 degrees.

What this means for shipping is stark. If shipping isn't to quickly consume the carbon budget of other industries and sectors, then it's remaining 1.5 degree carbon budget is just 10 Gts. At current rates of ship climate pollution that budget would be blown by 2029, gone in less than ten years. And at the moment IMO and its Member States have nothing in place that will change that fact.

So that's where we are.

And where we have to be is about more than zero by 2050. That would be a good start but it isn't enough to decarbonize by 2050 if in the meantime we blow the 1.5 degree budget and help send the world spiralling towards 2.5 or more degrees of climate chaos. A 1.5 degree goal means that zero by 2050 at the latest must be accompanied by deep cuts in ship emissions starting right now, with emissions cut in half by 2030.

To stand any chance of this happening the following needs to happen immediately:

.1 The industry and stakeholders need a clear and honest signal not just about direction of travel but also the scale and urgency of the task. They need to know that IMO is serious and that means a new goal of zero by 2050 at the latest and a halving of emissions by 2030. The proposal at this meeting for a resolution on zero by 2050 should be an important part of this. Delay until the revision of the Initial Strategy and you have lost the effect of two years of enhanced ambition… and the carbon budget is quickly draining away.

.2 The short-term measure must be revisited, levels of ambition consistent with a 50% cut in emissions by 2030 attached to it, and the control and enforcement problems sorted.

.3 The mid and long discussions need to speed up and refocus on what they can contribute to the halving of emissions before 2030, as well as raising the critically important climate finance that will be needed for a just transition.

.4 And finally, we need to turn off the 20% of shipping' climate impact that is black carbon. The proposed resolution on a fuel switch for ships in or near the Arctic should be followed swiftly by binding rules to remove this potent short-lived climate forcer.

No ifs, buts, nets, offsets, delays, or attempts to limit ambition to CO_2 only. Keep pretending that this problem isn't as big or as urgent as it is and that we can continue to talk rather than act is only going to make things worse and the future resolution of the problem harder, potentially even impossible, and that should be unthinkable for everyone at this meeting."

Consideration of mid-term GHG reduction measures in the context of Phase I of the Work plan for the development of mid- and long-term measures

Statement by the delegation of Argentina

"We thank all the proponents of the documents we are discussing and we are committed to developing mid- long-term measures. Some of the proposals oversimplify their assumptions effects, even when they address very complex issues.

I will give two examples. A universal and compulsory tax (levy) is presented as "not penalizing global trade", but in reality it has the high potential to penalize some distant countries in their trade, since the tax will most likely be passed on to the cost of freight.

In the same way, the approach proposed by Norway does not seem, in reality, to be assimilated to the Convention on Liability for Oil Damage in particular in the fact that the Funds contain contributions from oil companies, which are the possible active subjects of the pollution. In the event of an increase in the price of fossil fuel, there would be a cash transfer from the industry, but one that is likely to be passed on to the user of the cost of freight.

But in addition to the impact of medium and long-term measures on trade, there is the impact on States, which in the case of these measures can potentially be much greater than that of short-term measures.

In this sense, it is highly doubtful that the funds raised by any universal tax can compensate all developing countries impacted by it and to also fund R&D.

But we are ready to consider all the proposals in a constructive manner and we believe, like other Members, that the mid- long-term measures should be approached as a basket, that is the preference of the majority of the members already reflected in ISWG-GHG 10. This approach is also consistent with the Work plan for mid-long-term measures adopted by MEPC 76, which provides for the evaluation of the impacts on States during all stages of the consideration of candidate measures and to determine their viability.

We believe, like others, that the principles of the Initial Strategy must be duly taken into account in this exercise. We also believe in developing principles for market-based measures, as ICAO did, as more than 80% of world trade takes place by ship. We are ready to work together, even when document MEPC 77/7/12 seems incomplete to us and seems to legitimize unilateral actions by States or groups of States. But we are ready to address the question of principles for market-based measures.

Regarding your proposal, we agree to defer consideration of all the proposals to be worked at in the "basket of measures" concept during phase I of the Work plan and address them in the Working Group.

But let me remind that what we have in front of us now is a new "urgency" for the adoption of measures, as was raised with the short-term measure, and after the adoption of the short-term measure, there has not yet been a clear commitment of Members to address the negative impacts of the impact on developing States (whose assessment was already presented at MEPC 76). This aspect is crucial for many Members as we continue our work and we look forward to a constructive approach in this regard as well."

Statement by the delegation of the Bahamas

"Chair, there is an urgent need to consider both technical and market- based measures in order to proceed and a basket of measures may be evaluated and adopted for the mid- and long-term measures.

While trying to achieve this, MBMs should not be duplicative and we should aim to agree upon a single global MBM.

And finally, we believe progress for the measures should be done pragmatically, realistically, logically and not be overly ambitious."

Statement by the delegation of Greece

"Greece would like to extend its appreciation to the productive work and continuous efforts of this Organization towards combating air pollution and highlight its primacy in developing concrete measures and addressing effective solutions toward climate change. In remaining committed to the realization of the objectives and goals of the Strategy we would stress the urgency of initiating our discussions on mid- and long-term measures and on ways how to overcome existing markets in their development and implementation in order to pave the way to the decarbonization of the shipping sector.

Being more specific I would like to refer to the current lack of availability of low and zero carbon fuels and related infrastructure along with new reliable technologies deployed for international shipping. The transition to sustainable low and zero emission fuels is a highly complex issue, which can only be resolved with targeted research development and deployment (R&D&D) of safe quality-certified and commercially viable alternative fuels and related technologies thus widely available for use.

To this delegation it seems necessary to adopt a holistic and balanced approach by ensuring in advance that this deployment is followed by further critical changes in fuel supply chain by engaging legally and practically all out of sector stakeholders involved in this process in a fair and equal manner thus creating a sound balance between energy supply and demand.

Moving further to the mid- and long-term measures put forward we do support the technical, standard-based measure as it is included in document ISWG-GHG 10/5/3, proposing a gradual mandatory reduction of fuel intensity which we think it can effectively contribute to the smooth development of alternative fuels. The said measure provides also the flexibility to be combined with other mid- and long-term measures, such as MBMs that apply to the demand side namely the ships.

As regards MBMs in general we take the view that as part of the mid-term measures they will be key for the achievement of IMO Strategy goals, as an enabler of the transition. MBMs can actually promote the uptake of sustainable technologies, however a number of issues related mostly to their impacts and fitness for purpose vis-à-vis the modus operandi of the different shipping modes merit careful consideration.

A carbon pricing measure is an instrument to put in effect the polluter pays principle. In addition, it has the potential to send appropriate price signals and reduce the price gap between alternative and fossil fuels. Moreover, it generates revenues that could be used to facilitate the transition of the sector.

As carbon pricing measures can be designed in various forms and may imply complex legal and practical considerations, it looks very pertinent to first consider and agree on a set of

criteria against which such measures can be assessed and compared. Such an appropriate renewed framework is proposed in document MEPC 77/7/12. Amongst the carbon pricing measures put forward already namely the levy and the cap-and-trade system we think that they both maintain pros and cons. Therefore, they should both be further considered in Phase 2. From our end we think that of a levy-based system is more appropriate in terms of simplicity, enforce ability and equitability, without being short of potentiality to financially support the required R&D and other initiatives for the decarbonization of the sector.

The proposal in document ISWG-GHG 10/5/2 contains a well-developed structure of the measure that also fulfills also the basic principles put forward in document MEPC 77/7/12.

Finally, I would like to highlight IMO's role in adopting global and robust market-based measures, so as to establish a harmonized and consistent regulatory regime in terms of implementation and enforcement, while ensuring a level playing field within the sector."

Statement by the delegation of India

First statement

"On behalf of the co-sponsors of document MEPC 77/7/8, India would like to clarify that this submission is not against national initiatives from any specific country or group of countries to control GHG emissions. The primary objective of this submission is only to reiterate the relevance and significance of IMO as a single regulatory platform for international shipping.

While India certainly respects the sovereign rights of Member States to enact domestic laws within their territorial waters, our cautionary note to this Committee is only against regional regulatory measures, particularly financial measures, with its extended, extra-territorial application on international shipping. We are of the view that a regional authority using Port State Control (PSC) as a tool for imposing its domestic laws on a foreign flag ship on voyages mostly outside its territorial jurisdiction, on the justification that the ship either heading to or departing from one of its port, would raise serious issues of international maritime laws, including infringement of sovereignty, jurisdictional and legislative enforcement overreach.

The co-sponsors of this document also fear that such unilateral imposition of financial measures with quasi-global effect, on the pretext of environment laws, would be the domain of only those States that have the necessary economic leverage to compel its compliance. This would only result in an exploitative market-driven mechanism, that can be misused as a revenue generating platform at least by a few, rather than creating a facilitative environment for international shipping and can only further severe the socio-economic disparity among Member States resulting in an overall negative impact on our efforts in combating climate change issues.

We also have specific comment on references in certain documents endorsing extra-territorial regional measures from few Member States on the pretext of Article 211.3 of UNCLOS'82. We would respectfully request the learned delegates of this Committee to kindly refer to other sub-sections of the same Article, inter-alia, Article 211.4, which clarifies that Coastal States may exercise their sovereignty only in their territorial waters; Article 211.5 which clarifies that any legislation beyond territorial seas shall be in-line with international laws established through competent international organizations; and more importantly, Article 211.6, which clarifies that in case of any measure beyond the territorial waters over and above the international laws, it shall be in consultation with competent Organization, supported by scientifically proven evidence, specifically affecting such regions.

It is only an established scientific fact that climate change is a global issue to be addressed through global measures and we believe that IMO and this Committee is the competent international organization for the same.

Mr. Chair, this is a fundamental issue to be resolved by this Committee, and we cannot deviate from its discussions forever. We cannot afford to commit something at Paris, pledge something else at Glasgow and forget about all of them at London. If we think global measures are the best ways, let's work collectively towards that through this Committee. If not, let's leave the emission control to the regional authorities to deal with as per their national circumstances. If that be the case, we need not necessarily spent much time on discussing strategies or measure in that regard."

Second statement

"Regarding submissions on mid- and long-term measures, India would like to point out that the proposals on MBMs in these documents are premature for this session to consider, as we are only midway through the Phase I of a Work plan agreed as late as in the last session.

Nevertheless, this delegation would like to place on record India's current stand on MBM, that we are not in favour of any market-based measure to control GHG in international shipping, unless this Committee unambiguously resolve to demonstrate its commitment to ensure equitable implementation of these measures taking cognizance of the member state commitments and their differentiated responsibilities in line with UNFCCC, its Paris Agreement and Glasgow Pact of COP26 as the case may be.

Further, when we try to justify MBMs on the pretext of 'polluter must pay' we should also specify who the real polluters are. Is it the shipping industry which accounts for less than 3% of global emissions or the rest of the sectors that account for 97%? Is it a country like India accounting for 17% of world population but contributes less than 5% of global emission with a per-capita emission of less than 2tns and one of the very few countries in-line with its Paris commitments or is it the countries that historically owe a lion's share of cumulative global emissions and even on this date account for more than16tns of per capita emission?

Now coming to the merit of the issue. Regarding GHG levy, we are of the view that it will be premature to impose a disproportionately high carbon price on shipping at this stage, when we do not have sufficient zero-carbon technologies or net-zero fuels globally available for the industry to readily change over.

On the other hand, a variable, volatile and speculative pricing of carbon allowances under Emission Trading System (ETS) would make future investment decisions in zero-carbon technologies far more difficult and unattractive and would even make the funding for decarbonization and support to negatively affected States even more uncertain. India feels that any market driven mechanism of this kind, characterized with a variable, volatile and speculative pricing would be Business As Usual (BAU) and emitting as before for those nations and business houses having the financial might to afford such expensive offsets while the countries and communities who do not have such financial and technical wherewithal will be strangulated of development in their rightful journey towards better standard of living.

We would like to remind this learned forum that it is historically proven that IMO had been successful in leading and regulating the international shipping just through its regulatory and monitoring mechanism with the help of Member States; be it, safety or pollution control measures, and hence should refrain itself from getting into uncharted territories of economic control measures. Rather, we believe that non-economic measure proposed by few Member States such as GHG Fuel Standards still can create an encouraging scenario for alternative fuel without getting into GHG levy or emission trading."

Statement by the delegation of Tuvalu

"In this discussion about the MBM Tuvalu would like to reiterate the point made on a number of occasions by various delegations and most notably the Cook Islands that this debate is overdue since MEPC 57. IMO must now adopt an MBM in the form of a carbon levy because it is the only way that the market can engage the decarbonization transition. There is no other market tool at the disposition of the international shipping regulator, namely IMO, to do this. All the other measures are irrelevant if the market, which has so far refused to regulate itself, is persisting with the current trend despite the alarms raised from all corners of the planet. For Tuvalu, which is one of the most threatened low-lying atolls in the world, the alarm is every day at high tide.

Tuvalu also has some reservations with the process that consist in being extremely stringent with measures that aim at decarbonizing shipping in terms of impact on the state economy and more so in terms of actual externality and completely avoid the consideration of the current economic impacts and externalities caused by GHG fuels on the understanding that this is a given. We believed that some perspective should be added to the debate.

The question is therefore not whether we should have a MBM or not, but rather what carbon pricing will have an impact on emissions (expert think that 100$ a ton is a bare minimum), who will manage the revenue, how will this provide for adaptation, mitigation and compensation in the sense of international environmental treaty law, which IMO does not seem to understand that it is involved in making. As already indicated in previous statements, we wish to insist that these negotiations under the mandate from the UNFCCC have the legal nature of an environmental law treaty where equity is an important core concept implemented through differential treatments.

Tuvalu therefore supports the carbon levy proposal contained in document MEPC 76/7/12 and agrees that this proposal should be part of a basket of measures.

Echoing what the distinguished delegate from the kingdom of Tonga has said, we urge this assemble not to engage with the formulation of new guiding principles outside of the Initial Strategy, which are most likely incompatible with it. As a matter of consistency, we cannot on the one hand refuse to adopt a resolution on target (based on scientific evidence I must stress) as this must be considered as part of the review of the Initial Strategy; and, on the other hand, loosely accept guiding principles that would certainly have serious impact on the application of the Initial Strategy without proper discussion. Initiatives such as the one contained in the document MEPC 77/7/12 should therefore be discouraged.

We also agree that as a matter of work efficiency this Committee should group concrete proposals according to their characteristics so as to progress steadily towards the conclusion of phase 1 and move to phase 2 at MEPC 78."

Statement by the delegation of Vanuatu

"Vanuatu supports a basket of measures including a mandatory levy on all greenhouse gas (GHG) emissions from international shipping to be implemented by IMO.

However, this would have to take into consideration the highly predictable disproportionate negative impacts on SIDS and specifically in the Pacific region which is already heavily impacted by the highest international freight rates.
The recent Review of Maritime Transport 2021 issued by UNCTAD demonstrates the high vulnerability of SIDS stressing on the current surge in container freight rates which will significantly increase both import and consumer prices.

Prediction show that import price increase could go up to 24% and consumer price increase by 7.5% by 2023 for SIDS. Adding an international GHG levy would increase these predictions which most SIDS in the Pacific will not be able to cope with affecting all Pacific islanders notwithstanding the positive impacts of said levy.

We therefore strongly believe that would such a levy be implemented, freight rates and consumers prices should be carefully monitored in SIDS to then be mitigated would said levy lead to additional financial pressure on end consumers i.e. Pacific islanders. IMO could develop such a monitoring tool for use by regional MTCC in association with countries concerned.

Funds collected via said levy could help mitigating such end consumer prices increase that would inevitably occur with a levy which could very well increase ships operating costs by 50 to 60% (which will be passed on to end consumers) until the scheme provoke the expected paradigm shift."

Statement by the observer from IAPH

"IAPH was encouraged by the constructive start of the discussion over mid- and long-term measures at ISWG-GHG 10.

During this current Phase I of considering proposals, IAPH remains neutral as to the choice of instrument to be implemented. In our view though, the implementation of a global MBM by 2025 at the latest is essential for the commercially viable and timely introduction of low/zero carbon fuels. All current and forthcoming proposals will need to demonstrate both their effectiveness in achieving the needed GHG emission reductions, and their potential to achieve an equitable transition. Specific commitments toward technology transfer and capacity building are most important towards that direction.

Mr Chair, IAPH document MEPC 77/7/28 calls for a significant share of an MBM generated revenue to be allocated to land-side infrastructure, including port-related investments, in developing countries in particular, in order to facilitate the global deployment and use of low- and zero-carbon fuels and to contribute in parallel to an equitable energy transition of shipping.

Furthermore, regarding the organization and administrative frameworks guiding an MBM, IAPH believes that decisions about allocating funds and the identification of priorities should remain under the control of IMO and MEPC."

Statement by the observer from IBIA

"We thank all submitters of documents to this and previous sessions of the Committee, and the ISWG-GHG on this hugely important and complex agenda item.

Decisions taken at IMO will have major impact on the marine fuels sector, and will set the pace for the transition to low and zero-emission shipping. We need the market to respond with fuels and technology solutions, and we need to ensure the fuels and technologies on offer are technically feasible, safe to use and truly sustainable.

To achieve this, we need the right regulatory signals.

For sustainability, we need a holistic approach, taking full well to wake lifecycle emissions into account; anything else would discourage or even eliminate several options that are carbon neutral when considering full lifecycle emissions.

We therefore need a workable lifecycle assessment methodology and associated certification schemes, preferably a methodology that will apply a single and consistent international approach to determine the lifecycle analysis of fuels as supplied to the maritime sector.
We also need to stimulate innovation, and demand for alternative fuels.

For this we will likely need a substantial price on carbon and CO_2 equivalents to effectuate real change through market-based measures.

We know from the transition to IMO 2020 that most shipping companies waited as long as possible to comply with the 0.50% sulphur limit because low sulphur fuels cost more, so it is clear that the price of fuel is a very important market signal.

The proposals for a gradual phasing in of a GHG intensity limit have great potential to stimulate demand for zero and low carbon fuels. We already have a track record for such a gradual phasing in of sulphur limits in MARPOL Annex VI.
We saw that for ships to start using lower sulphur fuels, we needed clear regulatory signals to stimulate demand. The supply market responded to that demand by providing lower sulphur fuels in time for whenever new emission control areas and reduced sulphur limits came into effect.

We also saw that, despite fears of lacking availability, low sulphur fuels or technology solutions to help the global fleet comply with IMO 2020 sulphur limit were provided.

A gradual phase-in of a low GHG intensity limit could be a very effective tool to ensure predictable levels of demand, which the supply side would respond to."

Statement by the observer from CSC

"We would like to highlight a number of basic principles any MBM discussed at IMO must fulfil in order to be fit for purpose. MBMs that do not aim to meet these principles, or are very unlikely to do so, are - frankly - a waste of valuable and extremely limited time.

Any agreed IMO MBM must:

A. decrease climate pollution from ships as soon as possible in this decade, and bridge the price gap between fossil and zero-carbon sustainable fuels;

B. bring shipping in line with the Paris Agreement's 1.5°C target; and help reach a zero-GHG sector by 2050 as called for in document MEPC 77/7/3, and by the 14 countries at COP 26 that launched the "Declaration on Zero Emission Shipping by 2050"

C. use revenues wisely to

    i) support countries most at risk from climate change impacts, and countries and workers most dependent on shipping, and

    ii) invest in decarbonizing the sector by supporting roll out of clean technologies and infrastructure;

D. be negotiated and implemented quickly without pilot phases to avoid further delays in global action;

E. not include offsets, free allocations or any exemptions that would let polluters off the hook;

F. not undermine more ambitious climate regulations internationally, or in countries or regions. The solution to the shipping climate crisis lies in action at all levels and cannot be left to any single organization or process.

We urge all delegates to take these principles to heart to ensure an IMO MBM is a fair and effective decarbonization tool, that helps advance a just transition, but also helps the sector transition through making polluters pay, incentivizing fuel switches and rewarding early movers.

IMO should maintain a strict focus on bringing emissions down in line with the 1.5 degree temperature goal of the Paris Agreement, to halve emissions by 2030 and reach absolute zero well before 2050. An MBM could be an effective and efficient tool to do so, but only if well-designed and implemented quickly.

Finally, we would like to also stress that we shouldn't prejudge the sovereignty and ambition of some countries to complement IMO measures with further action at the national/regional levels."

How to address the increasing workload on reduction of GHG emissions from ships and proposals for alternative working arrangements

Statement by the delegation of China

"In general, we do not oppose to the holding of these intersessional meetings. However, we have serious concerns on the requirements of submission of documents. According to the current practice, the deadline for submission of documents to intersessional meetings is 6 weeks before the meeting, and there is no limit on document pages. In this case, the participants do not have enough time to fully understand and digest these documents, which not only affects the efficiency and effectiveness of the meeting, but also brings great difficulties and burdens to countries with weak participation capacities and non-native English languages speakers. This is not in line with the principle of fairness and conclusiveness.

Therefore we have the following suggestions:

First, as for the Intersessional Working Group meetings, the requirements of "Submission of documents" in paragraph 6.12 of Organization and method of work of this Committee (document MSC-MEPC.1/Circ.5/Rev.2) should be strictly followed.

Second, we noted the Ad-Hoc Expert Workshop on Impact Assessments will consider documents submitted to ISWG-GHG 11, and the Ad-Hoc Expert Workshop will be held 4 weeks earlier than ISWG-GHG 11. According to the current requirements on submission of documents for the intersessional meeting, participants will only have about one week to read these documents, which is totally insufficient. Therefore, on the basis of meeting the requirements of document submission in para. 6.12, the submission deadline of these documents should also be appropriately adjusted, to allow sufficient time for participants to read and digest the documents.

Mr. Chair, we request this statement be included into the report of this Committee, and be duly considered by the Council or Assembly when going through this agenda item."

Statement by the delegation of Tuvalu

"Please note that we have multiple issues of equity in these negotiations that are reaching unsustainable levels.

Some delegations had over 3 minutes to communicate their positions, whilst I have been limited to 2 minutes.

The country that I represent is particularly dependant on the outcome of these negotiations and we strongly consider that there is a lack of due process here.

This is all the more the case that since the beginning of the remote sessions, Pacific States such as Tuvalu are systematically given the graveyard shift in addition being the most affected by climate change.

Lastly, the video conferencing platform that IMO has chosen is not conducive of a clear and effective participation. Many delegations are breaking away and it is extremely difficult to deliver or receive a clear message.

In the context we are urging the Secretariat to review these issues and to offer alternative solutions for the next MEPC sessions."

REVISED PROPOSAL FOR AN INTERNATIONAL MARITIME RESEARCH AND DEVELOPMENT BOARD

Statement by the delegation of Panama

"In the first instance, the Republic of Panama thanks the industry and the co-sponsoring States of this proposal for the commitment shown in reaching the levels of ambition agreed in 2018 and applauds the efforts they have been made since MEPC 75 to clarify the concerns and uncertainties that several States have expressed since the presentation of this proposal.

Our Administration, committed to the Initial Strategy to adopt policies for the reduction of greenhouse gas emissions from international shipping and taking into consideration that achieving the targets set out in the 2050 Strategy would require the availability of alternative fuels and the deployment of zero-carbon technologies that are not yet available on the market, recognizes the need for research and development projects and it is for this reason that our delegation continues to support, in principle, the establishment of this panel.

We are aware that there are still issues that need to be clarified and clearly defined in the IMRB Charter, therefore Panama would like to make the following observations:

.1 It is important to clearly define how developing countries would benefit from the deployment of these new technologies, and we, therefore, support the content of document MEPC 77/7/30 presented by the distinguished delegation of Turkey.

.2 Taking into consideration that the authors mention that the Board of Directors of the IMRB would be composed of non-governmental professionals with expertise in different areas, this delegation is of the opinion that it is important to take into consideration the active participation of experts who can be nominated by IMO Member States. We, therefore, support the observations and proposals made by Turkey in document MEPC 77/7/31.

.3 We recommend that there should be greater participation of Member States in the IMRB Nominating Committee and that the number of seats allocated to them should be increased in order to provide the opportunity for Least Developed Countries and Small Island Developing States to be a part of this Committee.

.4 Clear and transparent procedures should be established for the management of the funds by the IMRB and the criteria and procedures to be used to determine the portion to be transferred to IMO Integrated Technical Cooperation Programme and the GHG TC Trust Fund should also be defined.

Mr. Chair, Panama would like to take this opportunity to highlight the role that the regional Maritime Technology Cooperation Centres (MTCCs) play in this transition process and the contributions they could make with respect to capacity building, project development, among other things, which is why Panama will continue to support the activities that these centres are carrying out, especially the MTCC Latin America and applauds IMO CARES initiative which will greatly assist in technology transfer. We urge donors to continue to make contributions to support the work of the MTCCs worldwide.

In summary, Mr. Chair, this delegation supports the establishment of this panel and the fund at this session as we mentioned at the beginning. However, it is essential that the observations we have mentioned in our statement be taken into consideration before proceeding with the final adoption of this proposal. For us, it is very important that the States have active participation in the management of this fund as well as in its structure, thus ensuring that developing countries benefit from the transfer of technologies, knowledge, etc."

Statement by the delegation of Vietnam

"Vietnam supports the views by other speakers that technical cooperation, technology transfer and capacity building is an absolute prerequisite for developing countries to be part of the decarbonization journey. While we may discuss ways and means of creating a fund for R&D, we must ensure that proper mechanisms are in place now that will ensure that the IMO resolution on technology transfer and capacity building will be supported. It is therefore important that IMO considers setting up such a technology transfer and north-south R&D collaboration mechanism that would facilitate transfer of R&D knowledge to the developing regions of the world, before any R&D fund is set up. Vietnam is participating in a number of major capacity building projects of IMO and we are currently discussing participation of Vietnam in the ASEAN focused Blue Solutions Project of IMO that will focus on maritime decarbonization technology demonstrations. We are also aware of the new initiative of IMO, named IMO CARES, will also aim at connecting global north and south in terms of technology cooperation and R&D collaboration.

Our delegation therefore suggest that IMO should look into strengthening these ongoing efforts first and through the proposed projects such as IMO CARES and Blue Solutions ensure that a mechanism is in place now that will assist with technology cooperation, technology transfer, technology demonstration and through such a mechanism, build capacities in our region, while more R&D is expected to happen in future."

Statement by the observer from WSC

"Numerous members of the Committee have pointed out this week the importance of agreeing to specific actions that enable us to meet the ambitions we establish to accelerate the transition of the world's fleet to the use of zero GHG fuels.

Available evidence demonstrates that the level of technical work and applied R&D devoted to zero-GHG marine research projects lags far behind the investments we see in other sectors. The proposal to establish the IMRB and IMRF is a detailed proposal to address this significant problem – as it would significantly expand the technical work and development of engineering systems necessary to safely use zero-GHG fuels onboard ships.

Simply put - This proposal is critical to accelerating our ability to put zero-GHG ships on the water. We need to do this without building ships and fuel infrastructure that may end up as stranded assets because we made well-intentioned, but mistaken investment decisions.

The proposal not only lays out an oversight structure for the work to be undertaken, it sets forth a straightforward mechanism to fund this work across the industry.

The time to expand this technical work and the sharing of what we learn is now, not years from now after we have stumbled into technical paths that lead us to dead-ends that are not technically or economically feasible.

Bearing this in mind, we encourage the Committee to proceed with this proposal because it is central to meeting the ambitions we seek in IMO and UNFCCC."

Statement by the observer from ICS

"Thank you for allowing this intervention and apologies for returning to the discussion on the IMRB, but we have some remarks which it was not possible to make when you summarized the discussion on Wednesday.

First, we were encouraged by the large number of interventions at this session in support of taking the proposal forward, as well as the suggestions for further improvements.

But it was unfortunate that those delegations which spoke at MEPC 76 were unable to indicate their current views with the benefit of the many additional submissions provided to this session, including their current views on the development of the IMRB as a short-term measure.

In your summing up you suggested that ISWG-GHG 12 should further consider the IMRB proposal as part of phase 1 of the ongoing consideration of mid- and long-term measures.

As the Committee will be aware, the Initial Strategy refers to the IMRB as a short-term measure, and a central feature of the proposal from Denmark et al. is that the IMRB is indeed a short-term measure.

This is because we have no time at all to waste to accelerate R&D if we are to deliver on even the current level of ambition for 2050.

Without prejudice to what this Committee may ultimately decide, if we treat the IMRB as part of the package of mid-term measures, we may have to wait until between 2023 and 2030 to finalize the IMRB. This would be far too late to increase Technology Readiness Levels in time and would send a very confusing signal to the industry, which has collectively offered to put forward 5 billion dollars.

Noting the place holder in the draft agenda for ISWG-GHG 12 included in WP.7, we respectfully suggest when the Committee confirms the agenda for ISWG-GHG 12 that consideration of the IMRB is included as a separate agenda item to the further consideration of concrete proposals for mid- and long-term measures."

ITEM 8

Statement by the representative of FAO

"Thank you Chair for this opportunity to present a short statement regarding the marking of fishing gear and an update on FAO work in this area.

Gear marking is an important tool for addressing both Marine Plastic Litter and Illegal, Unreported and Unregulated fishing. Following the endorsement of the Voluntary Guidelines on the Marking of Fishing Gears (VGMFG) in 2018, FAO is pleased to see growing interest for the implementation of gear marking.

Progress by FAO in this respect, includes the following activities:

.1 As a supplement to the Voluntary Guidelines, FAO is developing a technical manual for the marking of fishing gear.

.2 FAO is further developing the risk assessment provided in the Voluntary Guidelines for determining the need, and requirement's for, developing systems for the marking of fishing gear.

.3 FAO is currently working with one Regional Fisheries Management Organization on a project to implement gear marking. It is hoped that this will provide a model for other Regional Fisheries Bodies to follow.

These are some just some examples of FAO activities contributing to gear marking. FAO appreciates the work that has been done to bring this issue to the attention of IMO and the ambition of the proposal from Vanuatu. However, since MEPC 75, FAO has considered the matter further and recognize that implementing a mandatory obligation for the marking of fishing gear at this stage will be a challenge for the following reasons:

.1 The Voluntary Guidelines promotes the marking of fishing gears for all gears types, unless a relevant authority, as a result of risk assessment, deems otherwise.

.2 Recent research conducted by FAO shows that the development of affordable and effective gear markings is at an early stage. Currently there is still much work to be done on the design of gear marking technologies.

.3 The FAO Guidelines for Marking Fishing Gear is global in scope, it would therefore be optimal if the marking of fishing gear can be linked to a global vessel registration system, also for the purposes of combatting illegal fishing. The FAO Global Record of fishing vessels currently holds 12,000 vessels (2020). The latest estimate of total number of motorized fishing vessels is 2.8 million, if you add non-motorized the estimated total is 4.5 million.

.4 Many national vessel registration systems are currently not well developed or well maintained.

FAO is progressing the implementation of gear marking systems through various activities, and is working closely with the IMO secretariat on these and many other matters related to marine plastic litter. FAO remains available to join discussions on how best to work towards a mandatory obligation for the marking of fishing gear.

More information on recently conducted FAO workshops on the development of gear marking and risk assessment, can be found in the 'News and Events' section of FAO website 'Responsible Fishing Practices for Sustainable Fisheries'.

Thank you Chair, that concludes this intervention from FAO.

Useful Links
FAO workshops on gear marking and risk assessment https://www.fao.org/responsible-fishing/en/

Voluntary Guidelines on the Marking of Fishing Gear https://www.fao.org/responsible-fishing/resources/detail/en/c/1316982/

IOTC proposal TOR for a scheme to operationalise the FAO voluntary guidelines on the marking of fishing gear https://www.iotc.org/documents/proposal-terms-reference-developing-scheme-operationalise-fao-voluntary-guidelines-marking

FAO Global Record of Fishing Vessels https://www.fao.org/global-record/information-system/en/

State of World Fisheries and Aquaculture. *Status of the fishing fleet page 41* https://www.fao.org/3/ca9229en/ca9229en.pdf"

Statement by the observer from FOEI

"Delegates this is my first time at the IMO, and a year ago I never dreamt I would be here today addressing you. The sinking of the container ship - the MV X-Press Pearl – and spill of chemical products and plastic pellets into the seas of Sri Lanka caused untold damage to marine life and destroyed local livelihoods. This was not just a one-off incident - up to 230,000 tonnes of pellets are lost to the environment annually.

Plastic pellets are ubiquitous beach contaminants cause numerous negative physiological effects in animals and have the potential to be passed through the food chain including to humans. They also attract and concentrate toxic chemicals present in the water. We believe plastic pellets are likely to meet the IMDG and Annex III criteria for environmentally hazardous substances.

While we welcome the work of the IMO Action Plan on container losses, this will not be enough to ensure ‘zero loss to the environment’. As well as large-scale loss incidents like in Sri Lanka, South Africa, and the North Sea, pellets leak from the supply chain at every stage of handling. It is clear we need a global approach including chain of custody and liability, to ensure these events do not happen in future. It seems that we are not the only people who think so – over 60,000 people have signed a petition calling on the IMO to Stop Plastic Pellet Pollution At Sea.

To comprehensively tackle this issue, better labelling, containment, handling and emergency response protocols are urgently needed. We welcome document MEPC 77/8/3 from Sri Lanka and would encourage the Committee to accelerate efforts to manage pellet loss into the environment."

ITEM 9

Statement by the delegation of the Russian Federation

"Мы хотели бы обратить внимание на то, что авторами используются в качестве обоснования данные четвертого исследования ИМО по парниковым газам в части выбросов черного углерода, которые не подтверждены практическими изменениями, а основаны только на теоретическом анализе.

Как вы помните, на КЗМС75 в ходе одобрения результатов исследования делегации отмечали наличие очевидных ограничений по использованию данных по выбросам черного углерода с судов из четвертого исследования для обоснования каких-либо решений, это отражено в п. 7.58 отчета КЗМС75. А в данном случае мы в тексте документа и в параграфах 3 и 5 резолюции видим как раз пример подобного использования.

Далее, в параграфе 4 документа авторы ссылаются на документ PPR 8/5/1, в котором были представлены результаты исследования о зависимости содержания ароматических компонентов в топливе и выбросов черного углерода. Но мы все помним результаты обсуждения этого документа на PPR8 и критику делегаций относительно использованных в исследовании методов, которые не обеспечивают возможность распространить их результаты на все виды топлива и двигателей. Это отражено в п.5.7 отчета PPR8.

Поэтому мы считаем, что некорректно ссылаться на это исследование в качестве обоснования принятия резолюции.

Таким образом, в целом мы не можем поддержать проект, где в качестве обоснования призыва в параграфах 3 и 5 используются неподтвержденные данные. Мы полагаем, что ИМО как техническая организация не имеет права использовать сомнительные данные в принимаемых документах. Это подрывает авторитет ИМО как технической организации.

Подобная резолюция могла бы быть уместной в ситуации, когда имеются все достоверные и проверенные данные, и ИМО находится в процессе разработки соответствующих мер регулирования. В нашем случае нельзя говорить, что мы находимся на этом этапе. Комплексная работа продолжается в рамках PPR, и она в данный момент направлена на то, чтобы получить надежные механизмы изменения выбросов черного углерода с целью оценки их объемов и фактического воздействия на окружающую среду. В этой связи мы считаем подобную резолюцию преждевременной."

"We would like to draw your attention to the fact that the authors of the draft resolution use as a justification the data of the fourth IMO study on greenhouse gases in terms of black carbon emissions, which are not confirmed by practical measurements, but are based only on theoretical analysis.

As you recall, during the endorsement of the study, delegations noted at the MEPC75 that there were obvious limitations on the use of data on black carbon emissions from ships from the fourth study to justify any decisions, as reflected in paragraph 7.58 of the MEPC75 report. And in this case, in the text of the document and in paragraphs 3 and 5 of the resolution, we see just an example of such use.

Further, in paragraph 4 of the document, the authors refer to document PPR 8/5/1, which presented the results of a study on the dependence of the content of aromatic components in fuel and black carbon emissions. But we all remember the results of the discussion of this document at PPR8 and the criticism from delegations regarding the methods used in the study, which did not provide an opportunity to extend their results to all types of fuels and engines. This is reflected in paragraph 5.7 of the PPR 8 report.

Therefore, we believe that it is incorrect to refer to this study as a justification for the adoption of the resolution.

Thus, in general, we cannot support a project where unconfirmed data are used to justify the call in paragraphs 3 and 5. We believe that IMO, as a technical organization, has no right to use dubious data in the documents to be adopted. This undermines the credibility of IMO as a technical organization.

Such a resolution might be appropriate in a situation where all valid and verified data are available and IMO is in the process of developing appropriate regulatory measures. In our case, we cannot say that we are at this stage. Comprehensive work continues under the PPR, and it is currently aimed at obtaining reliable mechanisms for measurement of black carbon emissions in order to assess their volumes and the actual impact on the environment. In this regard, we consider such a resolution to be premature."

Statement by the delegation of Saudi Arabia

شكرا السيد الرئيس
يوم سعيد لكم جميعا

اولا نقدم التعازي لاهالي الضحايا في الحادث الماساوي اللذي حدث للمهاجرين في المانش امس
هذا الحادث يؤكد لنا باننا يجب ان نقوم بعمل كل شي ممكن لمواجهة هذه المعضله التي تحدث يوميا بمناطق مختلفة من العالم

السيد الرئيس نشكر مقدمي الوثائق تحت البند 9
نحن ندعم مداخلات مندوبين روسيا الصين اليابان المحترمين
حيث اننا لاندعم استصدار قرار الا بعد ان تقوم المنظمة بعمل المطلوب من تقديم البيانات الدقيقة
الحلول مطلوبة لهذه المشكلة المهمه والتي يجب ان تبنى على بيانات دقيقه
ونطلب ان تضاف مداخلتنا للتقرير النهائي