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AIR POLLUTION PREVENTION

Development of a technology neutral goals-based standard using the absence of pollutant discharges under fuel-based compliance as the benchmark for equivalency

Submitted by WWF, Pacific Environment and CSC

SUMMARY

Executive summary:	This document further develops the concept of a goal-based environmental standard under MARPOL Annex VI and invites feedback from Member States and international organizations. The proposed standard would establish the absence of operational pollutant discharges to the aquatic environment associated with fuel-based compliance as the benchmark against which alternative arrangements under regulation 4 would be assessed. The standard would ensure that compliance is not achieved through the transfer of pollution from one environmental medium to another.
Strategic direction, if applicable:	1
Output:	1.23
Action to be taken:	Paragraph 16
Related documents:	MEPC 84/10/4, MEPC 84/16; MEPC 79/5/3 and PPR 11/INF.20

Background

1 At MEPC 84, document MEPC 84/10/4 (WWF and Pacific Environment) was considered in the context of the regulatory matters component (part 3) of output 1.23 on evaluation and harmonization of rules and guidance on the discharge of discharge water from exhaust gas cleaning systems (EGCS) into the aquatic environment, including conditions and areas. The document introduced and invited feedback on the concept of a goal-based environmental standard that could be used to assess whether equivalent arrangements approved under regulation 4 of MARPOL Annex VI achieve an environmental outcome equivalent to that achieved through the use of compliant, low-sulphur fuel as required by regulation 14 of MARPOL Annex VI.

2 During the ensuing plenary discussion, several delegations expressed the view that the proposal warranted further consideration. Some delegations also invited the co-sponsors, together with interested Member States and international organizations, to submit a more detailed proposal for consideration at a future session of the PPR Sub-Committee. The Committee subsequently referred the document to PPR 14 and also agreed to extend the target completion date for output 1.23 to 2027 (MEPC 84/16, paragraphs 5.10 and 5.12).

Conceptual foundation

3 Regulation 4 of MARPOL Annex VI (equivalents) enables maritime administrations to allow for the use of any fitting, material, appliance or apparatus to be fitted in a ship as an alternative to that required by MARPOL Annex VI if it is at least as effective as that required by the Annex. However, MARPOL Annex VI does not establish a framework for evaluating equivalency where compliance is achieved through the transfer of pollution or impacts from one environmental medium to another, such as from air to water.

4 The implications of this gap are particularly evident in the context of EGCS. While both EGCS and the use of low-sulphur fuel can achieve the sulphur-emission reductions required by regulation 14 of MARPOL Annex VI, EGCS may do so by transferring pollutants from exhaust gases to the aquatic environment through the discharge of discharge water. Although only a fraction of the global fleet is fitted with EGCS, scrubber discharge water has become the dominant form of operational ship discharge, accounting for approximately 98% of ship-source operational discharges in EU waters and Canada.[1,2]

5 In the context of regulation 14 of MARPOL Annex VI, a technology-neutral goal-based standard is proposed for assessing the equivalency of alternative arrangements. Under this approach, the environmental outcome achieved through compliance using low-sulphur fuel would serve as the benchmark for equivalency. Compliance through the use of low-sulphur fuel achieves the required sulphur-emission reductions without generating associated pollutant discharges to the aquatic environment. An equivalent technology-neutral arrangement should therefore be required to achieve the same overall environmental outcome.

6 A fuel-based benchmark is appropriate because the use of compliant low-sulphur fuel represents the baseline form of compliance under regulation 14 of MARPOL Annex VI. The environmental outcome achieved through that pathway, namely compliance with the sulphur limits without generating operational pollutant discharges to the aquatic environment, provides an objective benchmark against which the overall environmental performance of alternative arrangements may be assessed to maintain a level playing field between different compliance methods.

7 This approach would constitute an evolution of the MARPOL Annex VI equivalency framework established by regulation 4 rather than a new regulatory concept. It retains the requirement that alternative arrangements achieve at least the same level of emissions reduction while providing a basis for assessing whether those arrangements achieve compliance through the transfer of pollutants or environmental impacts from one environmental medium to another.

8 The concept is consistent with MARPOL's objective of preventing and minimizing pollution from ships. It is also consistent with the principle reflected in Article 195 of the United Nations Convention on the Law of the Sea (UNCLOS), which provides that measures to prevent, reduce and control pollution should not result in the transfer of damage or hazards from one area to another or the transformation of one type of pollution into another. The approach is further supported by the emphasis placed by the International Tribunal for the Law of the Sea (ITLOS) on consistency and mutual supportiveness between UNCLOS and other applicable rules of international law (e.g. MARPOL).

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1 European Environment Agency (EEA) and European Maritime Safety Agency (EMSA), *European Maritime Transport Environmental Report 2025: Facts and Figures* (Luxembourg: Publications Office of the European Union, 2025), noting that "open-loop EGCS account for 98% of permitted water discharges," with the remaining discharges consisting primarily of grey water, sewage, bilge water and closed-loop EGCS discharges.

2 WWF-Canada, *National Vessel Dumping Assessment II: Changes in Ship Operational Waste in Canada's Marine Protected Areas (2019-2022)* (Toronto: WWF-Canada, 2026), reporting that scrubber discharge accounted for approximately 98% of the total waste discharged by ships into Canadian waters in 2022.

9 It is recognized that some pollutants emitted to the atmosphere may subsequently enter the aquatic environment through atmospheric deposition. However, direct discharge to the aquatic environment and atmospheric emissions are distinct pollution pathways and therefore warrant separate consideration when assessing equivalency under regulation 4 of MARPOL Annex VI.

10 Moreover, the comparison is not necessarily between the same pollutants or pollutant loadings. Exhaust from ships using residual fuels commonly used in conjunction with EGCS generally contains significantly higher concentrations of polycyclic aromatic hydrocarbons (PAHs) and metals than that from compliant low-sulphur fuels, and only a fraction of pollutants emitted to the air end up in the aquatic environment. Consequently, the environmental effects associated with these pathways differ.

Potential options for demonstrating equivalency

11 The co-sponsors consider that two approaches could be used to demonstrate compliance: a zero-discharge approach and a pollutant-free discharge approach. Both approaches have the potential to achieve the desired outcome of preventing pollutants and associated environmental impacts from being transferred to the aquatic environment through the use of an approved alternative arrangement. They differ only in how that outcome is achieved and demonstrated.

12 Under a zero-discharge approach, there would be no discharge arising from the use of an alternative arrangement into the aquatic environment. Water and waste from EGCS could be retained on board (as already done by a few ships) for delivery to reception facilities or managed through other approved arrangements. Equivalency would be demonstrated by the absence of discharge.

13 Under a pollutant-free discharge approach, discharge would be permitted only where it can be demonstrated that pollutants removed from exhaust gases are absent from the discharge water prior to any dilution. This recognizes that dilution may reduce measured pollutant concentrations without reducing the total mass of pollutants discharged to the aquatic environment. Total pollutant mass is particularly important for PAHs and metals, which can bioaccumulate in the food chain. This approach would require objective performance criteria, such as below-detection-limit thresholds for specified pollutants and water quality parameters before dilution, as determined using best available analytical technologies and validated through testing conducted by an accredited reference laboratory. At a minimum, the criteria should include analysis of the pollutants and parameters identified in the *2021 Guidelines for exhaust gas cleaning systems* (2021 EGCS Guidelines) (resolution MEPC.340(77)), including pollutants such as PAHs and nitrates, as well as water quality parameters such as pH and turbidity. Metals, though not explicitly referenced in resolution MEPC.340(77), should also be included.

Implementation

14 The standard should be implemented through an amendment to regulation 4 of MARPOL Annex VI. The amendment would establish the absence of pollutant discharges associated with the compliant-fuel pathway as the benchmark for approval of alternative arrangements.

15 The proposed standard would apply to all equivalent arrangements approved under regulation 4 of MARPOL Annex VI, including both existing and future installations. For ships already fitted with alternative arrangements, implementation could be phased in based on the installation date. In the case of EGCS, research conducted by Chalmers University finds that

more than 95% of ships fitted with the most common EGCS systems reach economic break-even within five years of installation (PPR 11/INF.20 (Sweden)). A transition approach linked to an installation date could therefore provide a reasonable opportunity for investment recovery while avoiding the inequities that could result from applying a single grandfathering period to installations of differing ages.

Action requested of the Committee

16 The Committee is invited to consider the information provided in this document, in particular to provide feedback on the concept of an environmental standard using fuel-based compliance as the benchmark, with the intention of returning to PPR 14 with a more fully developed proposal, and take action as appropriate.