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EVALUATION AND HARMONIZATION OF RULES AND GUIDANCE ON THE DISCHARGE OF DISCHARGE WATER FROM EGCS INTO THE AQUATIC ENVIRONMENT, INCLUDING CONDITIONS AND AREAS

On the calls to prohibit EGCS discharges – the facts and consequences

Submitted by IBIA

SUMMARY

Executive summary:	This document addresses repeated calls, including at PPR 12, to prohibit overboard discharges from exhaust gas cleaning systems (EGCS) and reiterates the need for clear and objective evidence of harm to the marine environment from the discharge of discharge water. The consequences of such a ban, rather than following a balanced goal-based approach to regulation, and the implications for the work of IMO to address GHG emissions from ships, are highlighted.
Strategic direction, if applicable:	1
Output:	1.23
Action to be taken:	Paragraph 30
Related documents:	MEPC.1/Circ.899; MEPC 82/5/1; MEPC 81/INF.21; MEPC 78/9/3; MEPC 77/16; MEPC 74/INF.24; PPR 12/16, PPR 12/7/4, PPR 12/7/3, PPR 12/7/2, PPR 12/INF.9; PPR 11/18, PPR 11/7/5, PPR 11/INF.11; PPR 9/INF.3, PPR 9/INF.8 and PPR 9/INF.16

Background

1 MEPC 78 approved the *2022 Guidelines for risk and impact assessments of the discharge water from exhaust gas cleaning systems* (MEPC.1/Circ.899). An important piece of work for the Working Group on Prevention of Air Pollution from Ships at PPR 12 was to consider draft terms of reference for the GESAMP Task Team on EGCS related to the development of emission factors that would enable ports and port States to complete a key step in EGCS-related environmental risk assessments, as recommended by MEPC.1/Circ.899.

2 The subject was discussed during PPR 12 under agenda item 7, the title and scope of which MEPC 77 had agreed for output 1.23 as follows: "Evaluation and harmonization of rules and guidance on the discharge of discharge water from EGCS into the aquatic environment, including conditions and areas" (MEPC 77/16, paragraph 5.14). Furthermore, PPR 12 noted that, after the invitation of PPR 11 for further proposals on the topic of identification and development of regulatory measures and instruments on the discharge of discharge water from EGCS, no new proposals by Member States had been submitted on this matter (PPR 12/16, paragraph 7.9).

3 However, rather than discussing the matter at hand, several delegations took the opportunity to call for a ban on EGCS discharges either globally or in certain areas. It was eventually decided that this line of intervention was out of scope and could not continue. Several other delegations noted that, in the absence of a new justification to impose additional requirements, a ban on the use of EGCS could not be supported and, instead, the preferred approach should be to increase the technical performance of EGCS by strengthening and updating the existing framework in the 2021 EGCS Guidelines (resolution MEPC.340(77)) for new ships, and adopting a gradual approach to avoid undue penalization of existing ships. These delegations also stressed that any restriction on EGCS discharge water should be preceded by an impact assessment in line with MEPC.1/Circ.899 and supported by reliable evidence (PPR 12/16, paragraph 7.13).

4 In addition, delegates attending PPR 12 received a presentation given by WWF, supported by the Chalmers University of Technology (Sweden), in which it was stated that the ecotoxicological effects of discharges could not be explained and emission factors were not a solution and so discharges should be banned. Chalmers University had previously attempted to develop emission factors for substances in EGCS discharges based on a literature search, which were originally submitted in document PPR 9/INF.16 (Sweden) and then again in document MEPC 78/9/3 (Germany). The data set has also been used in the European Union EMERGE project.[1] The shortcomings of these emission factors are discussed in documents MEPC 82/5/1 (IBIA) and PPR 11/7/5 (ICS and CLIA).

5 Documents PPR 12/7/4 (CLIA) and PPR 12/7/2 (Norway) also presented emission factors based on quality-assured data that were, for some parameters, several orders of magnitude lower than those set out in documents PPR 9/INF.16 and MEPC 78/9/3 after taking into account background concentrations of substances not originating from the EGCS process.

The European Union EMERGE project

6 Documents PPR 11/INF.11 and MEPC 81/INF.21 (Finland) reported on the findings of the EMERGE project, including comments on the effects of one part per million EGCS discharge water on early life stage sea urchins in adapted non-standard tests and the resulting indirect effects on fish, while other species in standard tests were found not to have the same level of sensitivity.

7 Among the repeated claims that there is "growing scientific evidence of the harmful impact of EGCS discharge water on the marine environment" (e.g. PPR 11/18, paragraph 7.9), the results of tests on sea urchin eggs are often cited when calling for a ban on EGCS discharges, and it was again the case at PPR 12. However, what is not included in documents PPR 11/INF.11 and MEPC 81/INF.21 is the "knowledge gap" given in the EMERGE project's final report[2] that "there is generally insufficient data on the impact of EGCS effluents on the

[1] https://emerge-h2020.eu/about-emerge/

[2] EMERGE Deliverable 9.4, "Final report to the EC summing up achievements of project, including financial report" https://cordis.europa.eu/project/id/874990/results

early life stages of fish and fish were not tested in the EMERGE project. Moreover, for many of the contaminants detected in the EGCS effluent, partly within the EMERGE project, the toxicity is largely unknown."

8 As with a number of earlier studies cited by Chalmers University in document PPR 9/INF.16, ecotoxicity testing in the EMERGE project was conducted using both standard and non-standard test methods and test species using laboratory engine produced scrubber water and samples from just two ships, with the comment "it is very unfortunate that IMO recommends that only standardized protocols be used for ecotoxicological testing of scrubber water" and "IMO may actually produce data of lesser quality and relevance, i.e., data unfit to protect marine life and ecosystems". However, the EMERGE project is also unable to explain its findings.

9 This contrasts with studies by the Danish Hydraulic Institute (PPR 9/INF.8 by CESA), Japan (MEPC 74/INF.24) and Oregon State University (MEPC 81/INF.38). All of these conducted whole effluent ecotoxicity testing including with fish and a risk assessment using internationally recognized standards and concluded that the risks of EGCS discharge water to the marine environment are acceptable.

10 Simply put, to date, there has been no evidence of harm to the marine environment to justify a global ban of EGCS discharges and rather than calling for a ban, it would be appropriate to follow the comment in the EMERGE final report that "extensive research is necessary to fill these critical knowledge gaps". This comment is not included in either of the recent submissions on the EMERGE project.

11 The unilateral use of non-standard tests resulting in outcomes that cannot be fully explained and then simply calling for a ban is not helpful for shipping and the wider international community, particularly when there is an existing framework in the form of IMO risk assessment guidelines that can be used and iterated for the benefit of all. Academia and industry can and should work together with international regulators using sound science, international standards and a goal-based approach to fully assess the risk of EGCS discharges to the marine environment

Benefits of EGCS

12 While IMO and the shipping industry strive to develop a pathway for GHG reduction, it is an inconvenient truth that all diesel engines emit exhaust gases containing undesirable products of combustion regardless of the fuel in use, including so-called "clean" fuels. This includes biofuels, synthesized fuels, gaseous fuels, and crude oil-sourced fuels that will continue to be used by ships for some time to come. Without exhaust gas cleaning, substances in exhaust gases end up in the atmosphere and, in many cases, find their way into the body of water in which the ships ply.

13 The calls to prohibit overboard discharges from exhaust gas cleaning systems are related to the sulphur oxides (SO_x) emission abatement being allowed on board ship as an equivalent means of compliance with regulation 14 of MARPOL Annex VI. However, exhaust gas cleaning is used in other critical safety and emission abatement systems. Since the 1970s, EGCS have been used in systems providing inert gas to fill the head space above the cargo on crude oil tankers. Exhaust gas recirculation (EGR) systems also use EGCS to condition engine exhaust gases for the reduction of nitrogen oxides (NO_x) to Tier III level and to reduce methane slip.

14 As water is the key enabler in all the aforementioned exhaust gas cleaning processes, banning overboard discharges effectively blocks the ability to use wet scrubbing (simple and advanced). If the discharge water is scientifically proven to be harmful to the marine environment, further measures can be considered, but prohibition because a finding in a laboratory cannot be explained is an inappropriate action that obstructs the ability to learn, innovate and where necessary put in place actions to mitigate risk, so the benefits of the technology are not lost.

15 An example of technology and innovation in action is onboard carbon capture and storage (OCCS), which could significantly reduce CO_2 emissions from ships. There are a number of technologies to achieve this. The most likely leading technology is to use a solvent to capture and hold CO_2 from the exhaust gas. In order to operate that technology, the exhaust gases must be thoroughly cleaned, and advanced wet scrubbing is the only currently known technology that is capable of achieving this.

16 Pioneering ship operators and marine technology providers are already investing in OCCS.[3] The efforts of these leaders and innovators must not be unnecessarily hindered; otherwise, the potential benefits will not be realized, confidence will be lost and investment wasted.

17 The exhaust gases from a diesel engine also contain fine and ultrafine particles and it is the number of these smaller particles rather than the overall mass that is particularly important for human health. Oeder et al.[4] demonstrated how the higher number of elemental carbon (soot) particles from "clean" diesel fuel combustion in a ship's engine could have fundamental effects on the lungs when compared with heavy fuel oil (HFO) combustion.

18 Fine and ultrafine particulate is present in all diesel engine exhaust, no matter what fuel is used. For large marine diesel engine applications, removal after combustion is the only practical and certain way to achieve significant reductions. While current EGCS do reduce fine and ultrafine particles, the primary design function is to remove sulphur oxides (SO_x). Whereas advanced exhaust gas cleaning techniques, using wet electrostatic precipitation for example, have the potential to provide a step change in the control of Particulate Matter, including Black Carbon (BC), which is another urgent concern of the Sub-Committee.

Changing fuel

19 IMO and the shipping industry are charting a course of GHG reduction and although consumptions will reduce, the use of fossil fuel oils will not disappear as an energy source for deep-sea shipping any time soon. It is therefore vital to examine closely how GHG emissions can be best mitigated during the transition to practical and sustainable alternatives that are available in quantity at a workable price.

20 Simply switching to a low-sulphur fuel will, on a lifecycle basis, significantly and unnecessarily increase the CO_2 contribution to the atmosphere as desulphurization and fuel quality improvements at the refinery require hydrogen, typically produced from methane, and more energy-intensive processes. It will also not resolve the issue of particulate emissions.

21 Approximately 20-25% of marine bunkers currently consumed is high sulphur fuel oil on ships with exhaust gas cleaning systems.[5] Document PPR 9/INF.3 (CLIA) presents a CE Delft study that shows a clear benefit of at least 5% to 10% lower well-to-wake CO_2 footprint when using high-sulphur fuel oil (HSFO) with an EGCS compared to using low sulphur fuels. The impact of switching away from HSFO and the other emissions that would result should be balanced against the effects

3 https://solvangship.no/2025/01/16/world-first-with-full-scale-ccs-on-board/

4 https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0126536

5 Argus Media (2025) *Argus Marine Fuels Outlook: Issue 25-2*, 26 February 2025, p.9.

of EGCS discharge water and the option to apply technical solutions to mitigate any evidenced risk.

22 A switch to low sulphur fuel will also incur greater costs for shipping. It should not be forgotten that ships move cargo and passengers around the world and, in the main, this is to ultimately meet the needs and demands of ordinary citizens. For the movement of cargo, it is typically charterers, not shipowners and operators, that pay for the fuel and in the cruise and ferry market, it is the passenger via the price of their ticket. Increased fuel prices mean the cost of goods and services will rise which in turn means higher prices for the consumer.

23 There are currently over 6,000 ships with EGCS installed. Document MEPC 81/INF.21 on the EU EMERGE project comments that "most of the global fleet has already amortized the cost of EGCS installation, and over 90% of ships do so within five years of EGCS installation". This suggests that because the costs of the equipment and installation have depreciated, it is now acceptable to prohibit the use of EGCS without grandfathering what was an approved equivalent means of compliance. This, of course, sets a dangerous precedent for the future that could undermine trust in the IMO process, as shipowners and technology providers will be reluctant to invest in technology that may subsequently be banned.

24 Document MEPC 81/INF.21 concludes that "Continued use of EGCS and high sulphur fossil fuels are likely to delay the transition to more sustainable fuels. The investments made on EGCS enable ships to continue using fossil fuels instead of transitioning away from them as soon as possible."

25 It is not EGCS that is relevant here. As stated above, for deep-sea shipping in particular, it is the production and availability of practical and sustainable alternative fuels in quantity at a workable price. This is outside the remit and control of the shipping industry. Shipowners and operators are commercial organizations in highly competitive markets and ships will naturally be equipped to provide a service to meet the needs and demands of charterers and passengers that is relevant, cost-effective and profitable at the same time. When alternative fuels become globally available and customers are willing and able or have to pay for them, shipowners and operators will adapt accordingly.

26 It should be noted that while not included in either document PPR 11/INF.11 or document MEPC 81/INF.21, the European Union's EMERGE project final report that these documents report on recognizes a project "knowledge gap" that "there is a lack in understanding of the basis for decisions made by ship owners regarding fuel choice and use of abatement measures".

Assessment and evidence

27 Paragraph 6.6.1 of MEPC.1/Circ.899 states that if a background concentration of a chemical substance in a sea area exceeds the predicted no-effect concentration (PNEC), it can be assumed that unacceptable risk already exists from exposure to that chemical. Coastal States can therefore prohibit EGCS discharges in their sea areas where the water quality is deemed poor, not from exhaust gas cleaning but from other sources such as industrial wastewater discharges and agricultural run-off. Some European Baltic coastal States have taken this approach.

28 Poor water quality in territorial waters due to causes unrelated to EGCS is not an appropriate or sufficient justification for a global ban on EGCS discharges to be imposed on others, as has been repeatedly called for. As identified in paragraph 10 of document PPR 12/7/3 (ICS), it is for individual coastal States to undertake their own risk assessments using the internationally accepted methodology and then, based on clear and objective evidence, conclude if the risk is acceptable or not. For example, document PPR 12/INF.9 (Brazil) is a recent example of an assessment that found the risk to be acceptable.

29 The Sub-Committee is specifically invited to consider the following:

.1 ships have been operating diesel engines with residual and diesel fuels for over 70 years, during which time emissions have been entering the waterbody via the atmosphere with no apparent negative effects recorded. Despite the claims of increasing evidence of harm to the marine environment from EGCS discharge water, there has also been no independently verified scientific data to support these claims and no evidence of harm to the marine environment. With the lack of empirical evidence from past and current waterbody research that confirms a causal link between EGCS discharges and any detrimental conditions observed outside the laboratory, the Sub-Committee should consider requesting interested parties to submit independent and verifiable data which has explicitly identified such links;

.2 in the event that science does provide a significant indication of harm to the marine environment, adjusted discharge limits should remain the primary option, enabling technology to provide the solutions, rather than employment of a total ban. In line with sub-paragraph 4 below, the Sub-Committee is invited to restate the Organization's goal-based approach which encourages the application of mitigating technical solutions as an alternative to prohibition;

.3 noting the Organization's ambition on reducing GHG emissions from international shipping, the Sub-Committee is invited to consider the development of a procedure that takes a more balanced goal-based approach than simply considering Well-to-Wake emissions to air from shipboard energy sources, with the outcome resulting in an overall benefit and value that takes into account any possible negative impacts from other emissions including those to water; and

.4 the technical, commercial and societal impacts of maritime decarbonization are very significant. Opportunities to mitigate those impacts with technology and science ought not to be jeopardized. The Sub-Committee is therefore invited to recognize the risk of unsubstantiated claims about EGCS discharges that result in calls for unnecessary bans. The consequence of such bans will be the loss to shipping of OCCS technologies and thus, as EGCS is a key component of these systems, the ability to substantially contribute to and even exceed the IMO Net-Zero Framework's GHG reduction goals.

Action requested of the Sub-Committee

30 The Sub-Committee is invited to consider the information provided in this document, in particular the consequences of EGCS discharges being prohibited set out in paragraph 29, and take action as appropriate.