

SUB-COMMITTEE ON POLLUTION
PREVENTION AND RESPONSE
13th session
Agenda item 5

PPR 13/5/12
5 December 2025
Original: ENGLISH
Pre-session public release:

**DEVELOPMENT OF A LEGALLY BINDING FRAMEWORK FOR THE CONTROL
AND MANAGEMENT OF SHIPS' BIOFOULING TO MINIMIZE
THE TRANSFER OF INVASIVE AQUATIC SPECIES**

Risk-based biofouling assessment and inspection framework

Submitted by CESA

SUMMARY

Executive summary: This document contributes to developing a legally binding framework for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species. It proposes a risk-based, data-fusion framework that links in-water inspections, AIS-derived exposure/idle risk and performance indicators into a unified trigger and decision model for scheduled and contingency inspections, cleaning interventions, and compliance documentation.

Strategic direction, if applicable: 7

Output: 7.16

Action to be taken: Paragraph 20

Related documents: MEPC 83/14/1, MEPC 83/17; PPR 11/5/7; PPR 13/5; resolution MEPC.378(80) and MEPC.1/Circ.918

Introduction

1 CESA supports in general the development of a legally binding framework for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species.

2 The success of such a framework depends on operational feasibility and the ability to integrate risk-based compliance approaches that reflect real-world conditions for owners, operators and other stakeholders.

Background

3 The 2023 *Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species* (resolution MEPC.378(80)) (2023 Biofouling Guidelines) establish the Biofouling Management Plan (BFMP) and Biofouling Record Book (BFRB) as core instruments, introduce a biofouling rating scale, and outline monitoring and contingency concepts.

4 The *Guidance on in-water cleaning of ships' biofouling* (MEPC.1/Circ.918) operationalizes pre- and post-cleaning activities, evidence quality, reporting, approvals and compatibility-led planning.

5 Document PPR 11/5/7 (CESA) highlighted the need for standardized inspection processes, reference areas and differentiation between scheduled and contingency inspections.

6 Hull and fuel performance monitoring activities can define indicators, including maintenance triggers relevant for biofouling risk management.

Discussion

7 Figure 1 of the 2023 Biofouling Guidelines provides a high-level operational flow chart for the typical biofouling management activities for a ship including a few sub-processes. However, practical implementation requires further outline of data sources and activity planning. No single method (in-water visual inspections, hull performance monitoring, AIS and weather data) can fully suffice to identify all risks posed to ship efficiency or biodiversity. Visual inspections are subjective and limited in coverage; AIS data indicate exposure risk but not actual biofouling growth; performance monitoring is a lagging indicator and subject to data gaps. Furthermore, monitoring of marine growth prevention systems (MGPS) and alternative anti-fouling systems (AFS) should be explicitly included.

8 A data fusion approach can address these limitations by integrating: in-service inspections (scheduled and contingency) for anti-fouling coatings (AFC) and MGPS, and idle time analysis, and hull performance trends (added resistance, power/fuel deviation). Such an approach can support the proactive management of ships' biofouling and enable compliance verification and enforcement from authorities while also enabling more efficient ship operations.

Proposals

9 Aiming to contribute to risk-based compliance and minimum inspection requirements into the development of a legally binding framework for biofouling management, the following proposals are put forward for further consideration and refinement.

Clarify "risk for biofouling accumulation"

10 It is proposed to clarify "risk for biofouling accumulation" in figure 1 of the 2023 Biofouling Guidelines by linking it to risk-based triggers informed by AIS, hull performance monitoring (via noon reports or high-frequency loggers), and visual data from in-service inspections for the AFC and MGPS. Without clearer guidance, there is a risk that ships using different performance systems will have different biofouling management thresholds, which can obscure the compliance process for a legally binding framework. Table 2 of the 2023 Biofouling Guidelines can be used as basis to further clarify the risks and set up thresholds.

Risk assessment and enhanced inspection regime

11 The following proposals aim to contribute to the development of a risk assessment framework and enhance the inspection regime by reducing the operational burden while maintaining biosecurity objectives through identifying high risk ships, improving in-water inspections, clearly defining type of inspections, introducing quality requirements for evidence and standardizing inspections processes.

Introduce a "risk-assessment-first" approach coupled with a risk-rating scale

12 Introduce a "risk-assessment-first" approach coupled with a risk-rating scale. Relevant data for the ships (BFMP, AIS, etc.) could be aggregated from the authorities and only high-risk ships would be required to provide additional in-water inspection reports beyond the scheduled inspections (every 12 or 18 months per the 2023 Biofouling Guidelines). For example, ships less than a year out of dry dock and operating in low-risk trade patterns could demonstrate compliance through remote data only, reducing unnecessary in-water inspections.

Recognize AIS and hull performance monitoring as compliance evidence

13 Recognize AIS and remote hull performance monitoring as compliance evidence to reduce operational burden while maintaining biosecurity objectives. AIS data points relevant for risk assessments include:

- .1 prolonged idle periods in warm-water regions (exact number of days may depend on AFS);
- .2 frequent calls to estuarine or lagoonal ports, and seasonal high-risk zones for biofouling accumulation; and
- .3 overall operational profile including speed and expected port stays.

Introduce a standardized scope for in-water inspections

14 Introduce a standardized scope for in-water inspections with generic principles for all ships. For example, imagery of draft marks (port/starboard, forward/mid/aft), flat bottom when accessible, documentation of mechanical scratches, and all niche areas when accessible (high-risk reference areas if constraints apply). Introduce a ship-specific in-water inspection process integrated in every BFMP (niche areas and hull design mapping).

Clarify differences between scheduled and contingency inspections

15 Clarify differences between scheduled and contingency inspections for AFC and MGPS. The same applies to in-water cleaning actions. Note this is also required for BFRBs which are structured on two sections: Part A includes the scheduled/expected activities and part B the non-scheduled ones. Clarifications for contingency planning can be based on appendix 1 of the 2023 Biofouling Guidelines (table 2 and figure 3).

Define contingency inspection triggers

16 Define triggers for contingency inspections, based on performance deviation, deviation from AFS specifications, or extended idle periods in high risk waters.

- .1 Performance deviation: A contingency inspection would be triggered in case of $\geq 10\%$ fuel deviation over a 90-day period. Such trigger will require ships to adhere to structured hull performance monitoring activities.
- .2 Deviation from AFS specifications and extended idle periods: Increased inspection frequency would be triggered when deviation from AFS specification occurs. On this note, "more frequent inspections" is referenced throughout the 2023 Biofouling Guidelines, though it has not been specified. For a legally binding framework, it is proposed to further define "more frequent inspections" during the time period when the ship deviates from AFS specifications, until either the ship returns to be within AFS specification or the ship's AFS is replaced/repared. This trigger would require coating manufacturers to provide operational guidance and thresholds in BFMPs.

Specify evidence quality for in-water inspection of the AFC

17 Specify evidence quality for in-water inspection of the AFC: For example, HD video $\geq 1280 \times 720$ with date/time stamps and ship markings; include references for the size of biofouling; store imagery and reports until next dry docking or coating application. Where flat bottom access is unsafe or impractical, document and defer with deadline; use inference from vertical sides to estimate the flat bottom growth when appropriate.

Standardize inspections process

18 Standardize the inspection process for AFCs, MGPS and alternative AFS that can be inspected from within the ship in the engine-room.

IMO Compendium

19 When developing the new legally binding framework, consideration should be given to the IMO Compendium of Maritime Data Sets with the aim of enabling biofouling to become a standardized data set alongside AIS, noon reports and fuel data. This will facilitate global interoperability, enhance compliance verification and support digitalization initiatives in shipping.

Action requested of the Sub-Committee

20 The Sub-Committee is invited to consider the information contained in this document and the proposals outlined in paragraphs 10 to 19, and to take action as appropriate.
