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

Implementation of the 2023 Biofouling Guidelines by ships and application of knowledge gained into the development of the legally binding framework

Submitted by ICS, BIMCO, INTERTANKO and INTERCARGO

SUMMARY

Executive summary:	This document highlights the operational and practical experiences of shipowners and operators with biofouling management. It focuses on the application of the key concepts in the *2023 Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species* and the *Guidance on in-water cleaning of ships' biofouling*. It also identifies some key elements that might be considered during the development of a legally binding framework.
Strategic direction, if applicable:	7
Output:	7.16
Action to be taken:	Paragraph 33
Related documents:	MEPC 80/4/15; MEPC 83/14/1; PPR 7/7/1; PPR 9/7/3, PPR 9/7/4, PPR 9/INF.19; PPR 10/5/9; PPR 12/5/1; resolution MEPC.378(80), MEPC.1/Circ.918 and MSC.1/Circ.1394/Rev.2

Introduction

1 The Marine Environment Protection Committee, at its eighty-third session, agreed to include in its post-biennial agenda an output on "Development of a legally binding framework for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species".

2 The Sub-Committee on Pollution Prevention and Response was instructed to take into account the *2023 Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species* (resolution MEPC.378(80)) (hereafter "the 2023 Biofouling Guidelines") and relevant technical information such as the *Guidance on in-water cleaning of ships' biofouling* (resolution MEPC.1/Circ.918) (hereafter "the IWC Guidance") when developing the legally binding framework.

3 Since 2018, BIMCO has conducted surveys on behalf of industry and submitted the results to the Organization. These surveys and other initiatives carried out by co-sponsors have gathered information on the biofouling management of ships and have highlighted both effective best practices but also several operational and practical challenges that would need to be considered when developing a legally binding framework. The outcomes of these initiatives are covered in paragraphs 7 to 31, although it is noted that the list may not be complete, as gathering experience on implementing the 2023 Biofouling Guidelines by ships is an ongoing process.

4 The co-sponsors believe that practical biofouling management experience gained by industry should be considered to ensure that the framework can support ship operations while minimizing the risk of transferring invasive aquatic species (IAS). Further, restrictions that may lead to a delay to ships and disruption of trade should be avoided and adding extra burdens on the crew should be carefully considered.

5 Although the 2023 Biofouling Guidelines and IWC Guidance are voluntary measures, it should be noted that nearly 50% of the participants in the 2024 BIMCO survey confirmed that they had adapted their biofouling management practices specifically to apply the Guidelines. Furthermore, the general principles of biofouling management that are detailed in the Guidelines are already widely implemented on ships; for example, having a Biofouling Management Plan (77% of survey participants) and conducting regular inspections of the hull and niche areas (74% of survey participants). Therefore, the Guidelines could provide a useful basis for the development of the legally binding framework. It is important to recognize that further industry experience of applying the Guidelines is required to adequately assess the practicability of specific provisions within them.

6 Full results from the 2024 BIMCO survey on biofouling management practices can be found at www.bimco.org/biofoulingsurvey.

Discussion

Anti-fouling coatings (AFC) and operating practices

7 Effective anti-fouling coatings (AFC) are central to avoiding or restricting the growth of biofouling and sustaining optimal hydrodynamic performance. There are numerous options on the market including biocidal self-polishing copolymers, silicone-based fouling release coatings, or hybrid systems. The AFC most commonly applied to ships are fouling release coatings with biocides and are tailored to the ship's profile and service period. The most effective coatings can perform for five years or longer when correctly applied, kept free from damage, and when the ship has been operating in accordance with the designated operating profile. Ships transiting regularly between fresh and salt water can often use a more cost-effective coating, as the alternating environments naturally reduce biofouling. Commercial best practices also ensure that biofouling is managed following idle periods or at the end of a time charter in line with contractual arrangements between owners and charterers.

8 AFC failures can occasionally occur due to improper application or unfavourable environmental conditions during application. This underscores the need to address adherence to manufacturer guidelines on thickness, drying times, and temperature control and collaboration with shipyards. Improper in-water cleaning may also damage the coating.

9 A coating can be damaged by coming into physical contact with, amongst other things, hard and heavy objects such as fenders, tugs, anchor chains, and seabed during low tide. Noting that areas with damaged or missing AFC may no longer be protected against biofouling growth, the regulatory framework should seek to include pragmatic and practical contingency measures which should incorporate some determination of damage which might be negligible, i.e. causes no increased risk of IAS introduction.

Niche area management and marine growth prevention systems (MGPS)

10 Many shipowners are already undertaking targeted management for niche areas that are prone to biofouling using an MGPS. The most common systems are differential coatings, chemical dosing systems, ultrasonic systems and electrolytic systems.

11 Ultrasonic systems are increasingly being used either as an alternative or to complement biocidal coatings. However, these systems may contribute to high-frequency noise emissions, which may affect marine fauna especially in sensitive habitats. Alignment should be considered with the *Revised guidelines for the reduction of underwater radiated noise from shipping to address adverse impacts on marine life* (MEPC.1/Circ.906/Rev.1) to balance anti-fouling benefits with noise mitigation as recognized by the terms of reference of the output.

12 Industry has initiated work to develop and improve the design of niche areas; however, there may be limitations to the effectiveness of such designs. As this initiative will not benefit existing ships, it will be necessary to differentiate regulations between new and existing ships. An MGPS may not remove the treated biofouling, so consideration to allow higher fouling rates in such areas should be considered.

Biofouling condition of the hull

13 Shipowners are regularly assessing the condition of the ship's hull primarily through performance monitoring, which involves tracking indicators such as fuel consumption and speed loss. This analysis, and particularly the relationship to biofouling, is promising but rather complicated as other factors, e.g. mechanical failures in the propulsion system, can influence speed and fuel consumption. The relationship between performance monitoring for efficiency and biofouling will need to be better clarified. Current methods include high-frequency sensor data collection, semi-automated calculations from noon reports and comparative speed trials. These insights often trigger targeted inspections, either by trained crew using remotely operated vehicles (ROVs), visual inspection from the quayside, divers or independent inspectors. In the context of a legally binding framework, such monitoring should form part of a compliance regime by linking performance data to inspection schedules.

14 It is also essential to define the biofouling condition threshold that triggers an intervention, and this should be supported by transparent and consistent determination methodologies including fouling rating, fouling extent and verification. These processes should be pragmatic and based upon best available science.

Planning and record-keeping

15 Biofouling Management Plans and Record Books (BFMPs and BFRBs) provide a structured approach for shipowners to document biofouling management including anti-fouling system (AFS) installations, cleaning events, etc. Many shipowners have already integrated BFMPs and BFRBs into their operational procedures either in line with the 2023 Biofouling Guidelines or to ensure compliance with regional rules. Standardization of BFMPs and BFRBs is considered important to support uniform enforcement. These documents are also likely to be a useful tool to facilitate proactive maintenance and optimize hull performance, and to provide evidence of the relationship between performance monitoring and fouling. Efforts such as providing clear guidelines and incorporating the necessary training should be taken to ensure that an unnecessary burden is not placed on crew. Consideration should be made as to how to align planning and recording-keeping with the wider efforts across the Organization related to digitalization. It is important that BFMPs and BFRBs can integrate with existing systems such as voyage management or planned maintenance record-keeping arrangements that are already covered by other requirements to avoid duplicate entries.

Inspections

16 A globally harmonized inspection regime including criteria, methods and data reporting will be needed to provide certainty for all stakeholders. Any mandatory inspection framework should include safety aspects of underwater diving operations and should balance environmental objectives with operational realities noting that sub-sea inspections are time-consuming and depend on external variables such as weather conditions. It should be considered whether inspections should follow fixed intervals, i.e. be time-based, or be risk-based, i.e. triggered by robust monitoring data or operational conditions.

17 Lack of availability of inspectors competent to undertake inspections in line with the 2023 Biofouling Guidelines will need to be addressed, as will the lack of the practical elements necessary for an inspection (such as ports with suitable water quality, access to divers and ROVs). The added administrative burden for authorities ashore, and the importance of not causing undue delay to ships, means that there may only be a few States where inspections can be undertaken. The co-sponsors believe that this potentially could undermine the global nature and application of the new regulatory framework.

18 Today, BFMPs specify under which circumstances in-water inspections may be conducted. Some inspections are prescheduled in accordance with the ship's planned maintenance system (PMS) while others are planned in accordance with the operational profile of the ship and are carried out during statutory and class in-water surveys between dry dockings. This practice should be allowed under the mandatory scheme to keep administrative burdens and costs low.

19 The co-sponsors are of the opinion that a risk-based inspection regime based on the likelihood of biofouling growth, real-time data, operational conditions, and in parallel with existing industry practices as per examples in paragraphs 13 and 18, is more effective than a fixed interval approach.

20 Clear standards should be established for all inspectors from crew members using an ROV to external inspection companies. This should be established alongside an approval or certification scheme for technologies such as ROVs used to undertake such inspections.

Proactive in-water cleaning

21 Proactive in-water cleaning is increasingly being seen as a practical way to maintain hull cleanliness, removing microfouling to realize efficiency gains. Such systems are still emerging and are not yet available at the necessary commercial scale should they become a requirement under a mandatory framework. Nonetheless, these technologies are developing fast, and operational experience is being gained.

22 In future, many of these systems are envisioned to be devices that may be operated by the ship's crew while the ship is under way in open waters and outside sensitive sea areas. As the systems would be carried on board, the ship crew's work burden and additional responsibilities would need to be considered as would training in the use of these systems. Challenges relating to the maintenance and operation of these devices would also need to be addressed.

23 The removal of biofouling from the hull during a ship's voyage represents a promising approach to minimizing the introduction of invasive aquatic species, given that the associated biosecurity risk in open sea is minimal. Accordingly, when the ship is more than 12 nautical miles from land, such cleaning should be permitted globally to be carried out "without capture". As such, the co-sponsors consider that this method should be incorporated within the legally binding framework.

Reactive in-water cleaning

24 The BIMCO surveys show that most operators only use reactive cleaning as a mitigation or correction measure, for example after prolonged idling or when performance monitoring has indicated efficiency losses that are attributed to fouling. There are also several documented cases when cleaning has had to take place prior to entering waters to comply with local regulations.

25 While proactive cleaning technologies are still in development and not available commercially at the necessary scale, reactive cleaning accounts for most in-water cleaning events, often performed at anchorage using divers with brushes or water jets. At present, ROV use is limited and usually supplementary to divers. As with inspection, the regulatory framework should include the safety aspects of underwater diving operations and should balance environmental objectives with operational realities.

26 Reactive cleaning as a management approach is costly, time-consuming, and heavily dependent on port approvals and service availability. Current availability is limited and fragmented and is likely to create significant compliance challenges for ships operating internationally. To prepare for prolonged idling and stringent local regulations, the legally binding framework should support global availability and access to in-water cleaning and ensure that cleaning services can be carried out in a safe way. This will require a framework that supports the development of cleaning technology, approvals and certification, enabling wider adoption and reducing uncertainty for in-water cleaners and ships using their services.

27 A regime mandating frequent hull cleanings could have significant implications for trade and shipping schedules, primarily due to operational delays and port congestion. At present, the surveys illustrate that most operators realize efficiency and emission-reduction benefits from cleaning. However, under a mandatory regime, such benefits may be offset by delays, port entry bans, diversion voyages to use approved cleaning facilities, etc. Should only a few ports permit cleaning, this limited availability would force ships to wait for slots at these ports, creating bottlenecks and cascading delays across supply chains.

28 In-water cleaning is the most feasible cleaning solution. Cleaning in dry dock will not be a feasible option where dry-dock availability (primarily centred in Asia) would dictate cleaning schedules. Dry docks often have long lead times (three to six months would be common), especially during peak seasons where there may be bottlenecks. Additionally, larger or specialized ships may require specific docks, which are in higher demand. Even if the operator has the option to be flexible, on-location waiting times could be at least one month. Treating biofouling as an emergency could result in prioritization, but this would be extremely costly and highly disruptive for other ships needing for example more urgent repairs for safety reasons.

29 A practical approach to waste capture based on technological capability and risk and management of generated waste should be considered. The downstream management of waste and the wide availability of adequate port reception facilities would also need to be discussed, and experience with other legal instruments that extend beyond the regulation of the ship should be utilized.

30 Any cleaning procedure should not be conducted in a manner that impairs the current and future performance of the AFS. Damage to the AFS may not be immediately visible but may later result in accelerated biofouling growth. The performance of an impaired AFS should not be expected to be the same as before the cleaning operation. A cleaning requirement that is too frequent, therefore, is likely to have a detrimental impact, reducing the effectiveness of the AFS and its ability to minimize biofouling.

31 The legal framework should accommodate both in-water cleaning approaches, incentivizing proactive measures for efficiency and IAS prevention and ensuring safe and environmentally sustainable reactive cleaning as a contingency measure is readily available. Certification or approval schemes for cleaning companies should consider the importance of ensuring global in-water cleaning capacity and consider including a phase-in period to ensure the availability of sufficient cleaning systems with capture.

Summary

32 Paragraphs 7 to 31 identify some key elements that might be considered during the development of a legally binding framework:

.1 AFCs and operating practices, including effective AFCs, proper application, adherence to operating profiles, and damage prevention;

.2 niche area management and MGPS, including use of MGPS and design improvements, which may necessitate different rules for new and existing ships;

.3 biofouling condition of the hull, whereby regulation on performance monitoring should combine with existing operational practice;

.4 planning and record-keeping, whereby the framework should support compliance, proactive maintenance and digital integration, and align with existing administrative systems to avoid duplication and minimize crew burden;

.5 inspections, noting that a globally harmonized inspection regime is needed, balancing safety and operational realities with risk-based inspections;

.6 proactive in-water cleaning, whereby the legally binding framework should permit cleaning beyond 12 nm from the shore; and

.7 reactive in-water cleaning, whereby the framework should balance efficiency, environmental goals and operational feasibility, noting that a mandatory cleaning regime potentially risks disrupting trade.

Action requested of the Sub-Committee

33 The Sub-Committee is invited to consider the points in paragraphs 7 to 31 in its work on the legally binding framework and, in particular, the main elements in paragraph 32.