INTERNATIONAL MARITIME ORGANIZATION

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SUB-COMMITTEE ON POLLUTION PREVENTION AND RESPONSE
7th session
Agenda item 7

PPR 7/7/1
5 November 2019
Original: ENGLISH
Pre-session public release: ☒

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))

Biofouling management survey

Submitted by BIMCO

SUMMARY

Executive summary:	The document reports on the results of a survey asking shipowners about their biofouling and in-water cleaning management
Strategic direction, if applicable:	Number to be assigned after A 31
Output:	Number to be assigned after A 31
Action to be taken:	Paragraph 37
Related document:	Resolution MEPC.207(62)

Introduction

1 MEPC 73 decided on the new output titled "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)".

2 Biofouling management is an important issue for shipowners because biofouling has the potential to transfer invasive aquatic species (IAS) and to increase the ship's drag in the water. An increased drag significantly reduces the hydrodynamic performance and increases fuel consumption, thereby impacting the ship's greenhouse gas (GHG) emissions.

3 BIMCO is leading a working group to develop both a manual of requirements for approval and certification of cleaning companies plus an in-water hull and propeller cleaning standard. The standard should ensure that:

.1 the result of the cleaning is in accordance with a set of specifications;

.2 the environmental impact of the process and coating damage is controlled; and

.3 the cleaning process is planned, safe and effective.

4 The working group consists of paint manufacturers, shipowners, ports, authorities, in-water cleaning companies, the International Association of Classification Societies and the International Chamber of Shipping.

5 In May 2018, BIMCO launched a biofouling survey to gain insight into how shipowners are managing biofouling and in-water cleaning.

6 This document presents the results of the survey together with possible explanations related to the work of the Sub-Committee.

The survey and participants

7 The survey was conducted over a six-week period starting in May 2018.

8 In order to gauge the size of the fleet, the first question asked for the number of ships the company owned or operated. In the annex to this document, the questions can be seen in full.

9 BIMCO received replies from 38 different companies owning or operating a total of 2,205 ships. The respondents' fleet sizes varied from 1 to more than 500 ships. The companies represented the following cargo sectors: dry bulk, wet bulk, heavy lift, container, ro-ro and offshore.

Anti-fouling systems (AFS)

10 Respondents with large fleets used different anti-fouling systems on different ships according to the ship's trading profile. Thirty-four of the respondents used biocidal coating on their ships. Foul release coating accounted for seven companies while hard coating and others were the least used method: each represented by two respondents.

11 Question three addressed the average planned service life of the antifouling coating system that was applied to the ships. Ships using biocidal coatings, e.g. self-polishing copolymer (SPC) replied three to five years. The age for foul release coating, e.g. silicone, was reported to last between 5 and 10 years on average while hard coating, e.g. biotechnology lasted between 5 and 25 years.

12 Question four asked if the company monitored the performance of the AFS and if so how. Only two respondents replied "no" to monitoring. The replies can be seen in figure 1.

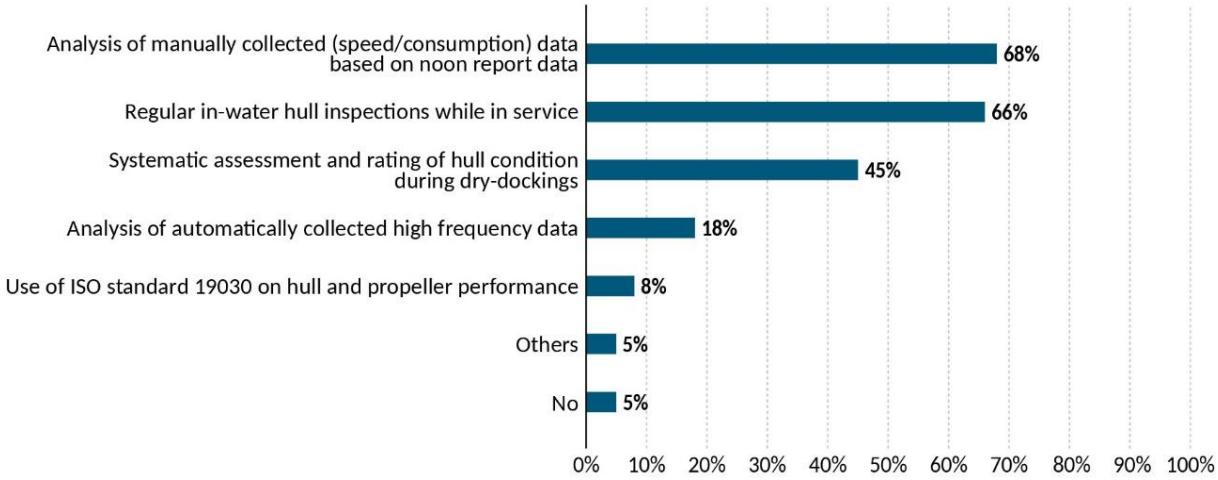

Figure 1: How respondents monitored the performance of AFS

13 There are different ways to collect data on a ship's fuel consumption, which can be used to estimate the level of fouling on a ship's hull. In some cases, the data is collected manually using the ship's position every day at noon, the distance covered, average speed, fuel consumption, weather information, etc. On other ships, data is collected regularly using an automatic data collection system. The system collects the required data automatically from the ship's sensors such as GPS, main engine, weather sensors, etc.

14 Figure 1 shows that manual collection of data is the most popular method among the companies that responded. The 68% of respondents that collected data based on noon reports operated 2016 ships collectively; while the 66% of the respondents that conducted regular in-water hull inspections while in service operated 2,059 ships. Another important way to rate the hull condition was during dry docking. This was done by 45% of the respondents, however they only operated 534 ships. This indicates that respondents with a large fleet are more actively collecting data to determine biofouling than respondents with relatively few ships.

15 One respondent replied to have their own standard for measuring hull performance but did not provide a detailed explanation of what the standard included.

16 Regular in-water cleaning inspection is more reliable and has the advantage that the condition of the AFS can also be observed during the inspection. It is mostly used on ships that are operating on a regular route.

17 It should also be mentioned that the percentages in figure 1 are accumulated and that several of the companies use more than one method. This is probably due to contractual demands by the charterer or the paint manufacturer. Between the four most popular methods mentioned in figure 1: one respondent used four different methods, 12 respondents three, seven respondents two and 12 respondents one method.

Biofouling management plan

18 All the respondents, except one, used a biofouling management plan on board their ships. Figure 2 shows in detail how the ships implemented the biofouling management plan into their shipboard management systems used such as the safety management system (SMS) and/or the planned maintenance system (PMS).

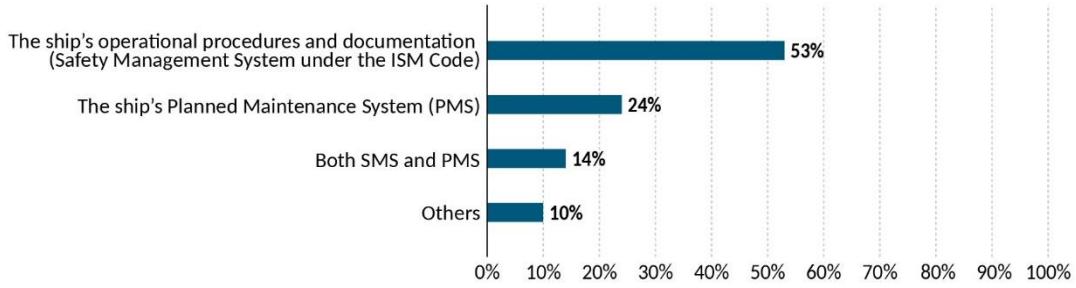

Figure 2: The way in which the biofouling management plan is implemented

19 The percentages in figure 2 are calculated using 51 responses since some companies responded more than once indicating that not all ships used the same systems. Some respondents used both SMS and PMS and the percentage has been added to the graph. The most popular system was SMS. A minority of the respondents had it only due to the requirements of their trade and one respondent had no biofouling management plan.

Regulations and guidelines

20 Question six asked if the biofouling management plan took into consideration the different local regulations dependent on area of trade and the Biofouling Guidelines. Again, the respondents were asked to select all relevant options. Figure 3 shows the result.

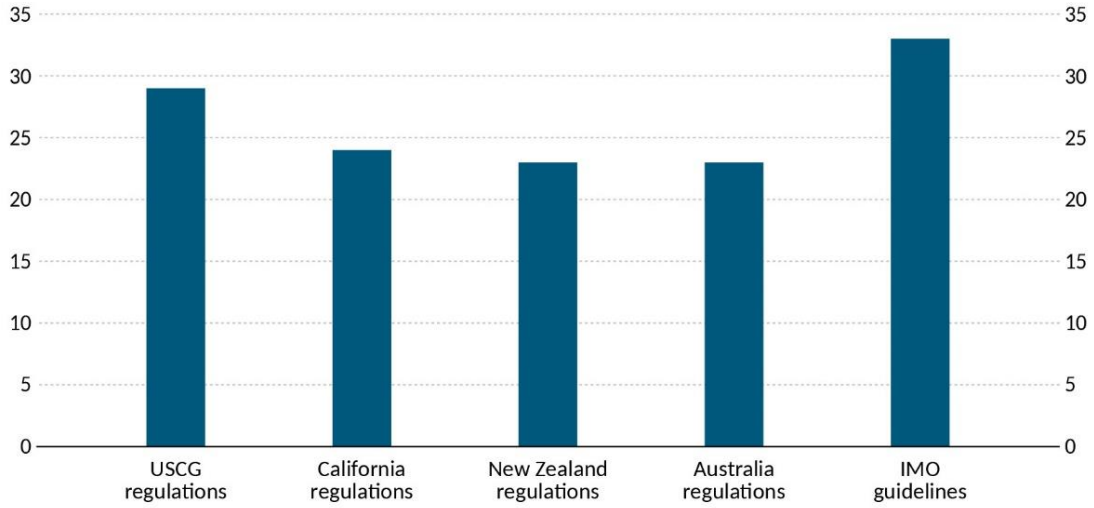

Figure 3: Consideration of local regulations and IMO recommendations in the biofouling management plan

21 It is worth noticing that 33 respondents out of a possible 38 (87%) took the Biofouling Guidelines into consideration.

In-water inspections

22 In question seven, BIMCO asked when shipowners undertook in-water inspections. Several options were given, and the respondents were asked to choose all relevant statements. The results can be seen in figure 4.

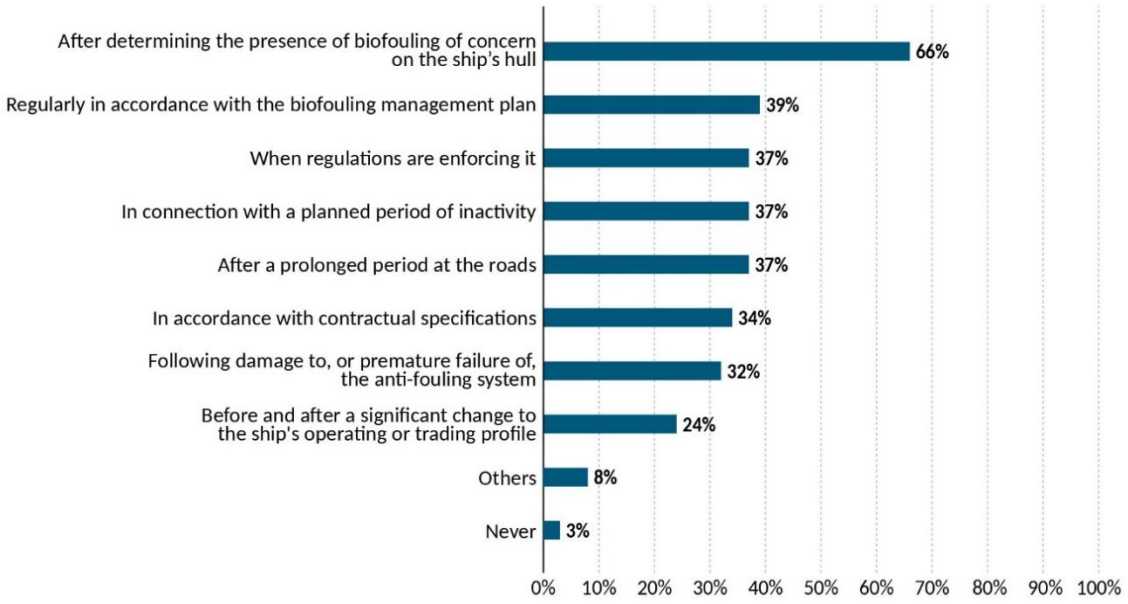

Figure 4: When respondents are carrying out in-water inspections

23 The options given in figure 4 were intended to reflect the operational side of the ship. It is not surprising that two-thirds of all ships called for inspections if a concerning level of biofouling had been determined, but a few of the options may benefit from further explanation.

.1 "Regularly in accordance with the biofouling plan" may cover many different aspects. The questions in the survey were not sufficiently detailed to provide data that showed what regularly meant. But it is, for example, quite normal to have divers examine the hull in connection with an in-water cleaning of propeller. Such cleanings are normally performed frequently as fouling of the propeller has a relatively large impact on a ship's fuel consumption.

.2 Some AFS work only when there is a certain amount of water flow around the ship's hull. Fouling will emerge if the ship stays in waiting areas, ports, anchorages and/or berths for prolonged periods. In some cases, undertaking a sea passage with a certain speed and duration will be enough to remove the marine growth but not always. When the ship has been idle for a certain period, it is common to perform an in-water inspection. A charter party may stipulate how many days the ship can be idle before an inspection should be carried out. Normally, it is also agreed and specified in a charter party about which of the parties will bear the cost of any such cleaning.

.3 In-water inspections are also carried out to ensure compliance with the recent unilateral regulations, which require ships entering the waters of the coastal state to be free of marine growth. If entry into the destination port is denied by authorities due to biofouling growth on a ship's hull, the shipowner faces severe financial consequences, especially if the coastal State has no hull cleaning facilities. Furthermore, if a ship is forced to sail to another location to perform a hull cleaning, it will increase fuel consumption and greenhouse gas (GHG) emissions.

.4 Under others, respondents wrote increased resistance and inspections every 2.5 years during a ship's intermediate survey.

In-water cleaning

24 In response to question eight, "when is an in-water cleaning undertaken", a few options were given. Figure 5 shows the results received from the respondents.

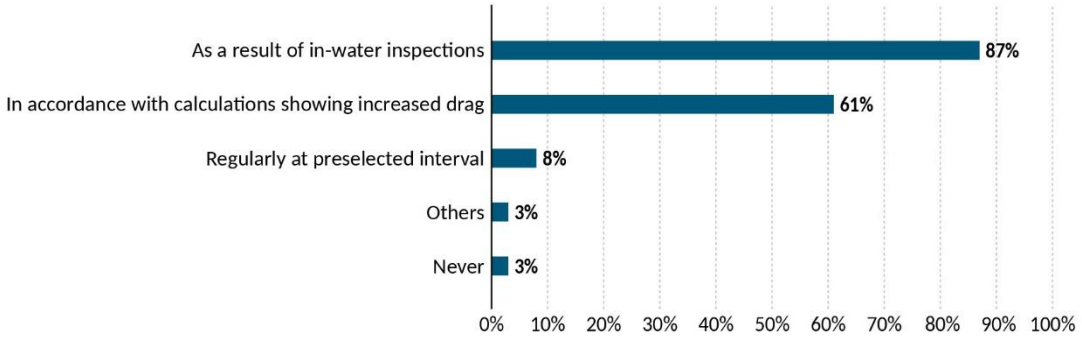

Figure 5: When an in-water cleaning is being undertaken

25 In general, the shipping industry uses two different approaches to determine when to clean the hull. The first approach is responsive cleaning: reacting to observations made during inspections and/or when fuel consumption has increased due to more frictional resistance between the hull and water. The other is proactive cleaning that is being done based on preselected intervals regardless of the presence of fouling. As can be seen, most of the respondents are using responsive cleaning and only 8% of the respondents use proactive cleaning.

26 One respondent stated that most of their ships had a five-yearly paint scheme application. They would get the hull cleaned depending on drop in performance or every 2.5 years, during the statutory in water survey as required by Administrations.

27 One of the big concerns regarding in-water cleaning is that the AFS may be damaged due to the mechanical impact of brushes or waterjets used during the in-water cleaning. Question nine asked if this was taken into consideration when ordering the in-water cleaning: 81% did and 19% did not.

.1 If parts of the AFS surface are damaged or removed, biofouling could grow faster, which means hull cleaning will have to be performed more often.

28 Several respondents provided comments to this question:

.1 systems that were used to avoid impact were soft brushes, water and air jet systems;

.2 two respondents mentioned that the trade of the ship did not always make it possible to choose between different cleaning systems;

.3 one respondent mentioned that a country had stipulated requirements regarding which cleaning tools to use; and

.4 one respondent mentioned that cleaning was made at the microfouling stage as much as possible.

29 When asked about niche area cleaning (question 10), 82% of the respondents confirmed that they cleaned niche areas. Niche areas are normally cleaned during dry docking, but the comments made by the respondents to this question show that it also takes place during in-water cleaning.

.1 The niche areas mentioned in the comments were rudder, sea chests, bow thrusters, sea suctions, chain lockers and propellers. One respondent mentioned that only the gratings of the niche areas were cleaned.

.2 One respondent mentioned that an increased schedule of hull cleaning had had the effect that niche areas were being cleaned more frequently.

.3 Two respondents commented that the cleaning of niche areas was done to accommodate local regulations.

Biofouling record book

30 Question 11 asked if the respondents used and maintained a biofouling record book. If the answer was "yes", they were asked to provide information about the content. Three respondents answered "no" to the question and one respondent had delegated the task to a technical management company. The result of the "yes" replies can be seen in figure 6.

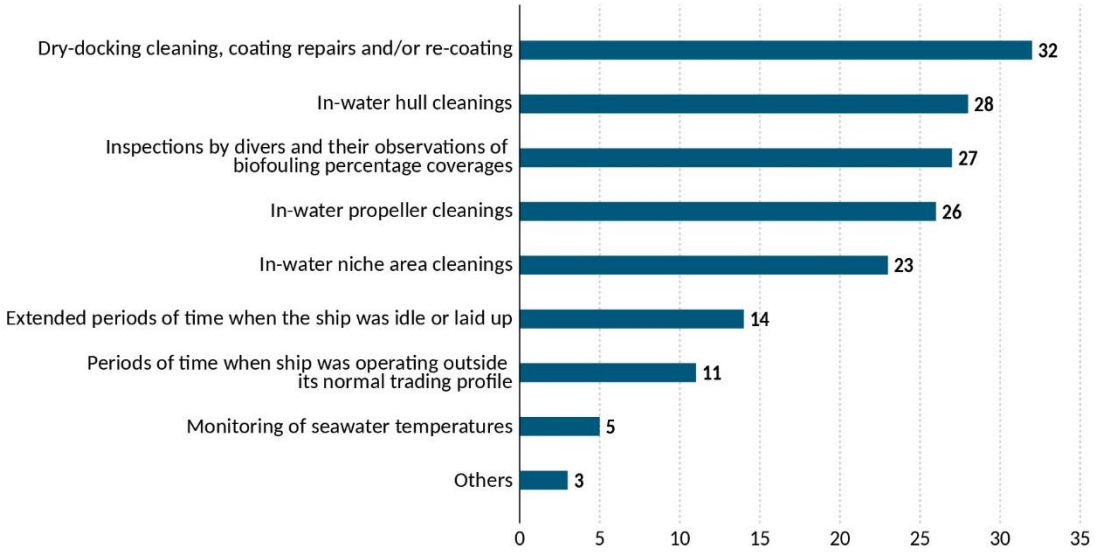

Figure 6: content of the biofouling record book information

31 Under others, respondents mentioned that the task had been given to technical managers and that details were captured in the PMS or in the statement of facts given by class after in-water inspections.

32 Most categories mentioned in figure 6 have, in a generalized form, been taken from annex 2 to the Biofouling Guidelines, which describes the biofouling record book form.

33 From the general comments, the following are worth mentioning:

.1 environmental cleaning options are not easily available;

.2 environmental cleaning is generally too expensive;

.3 hull fouling is on the rise with eco speed sailing and same paint specs as used earlier;

.4 as ships trade worldwide, the problems are mostly related to the availability of approved locations and availability of cleaning techniques at such locations; and

.5 international criteria should be established for assessing the fouling marine growth limits for ships that will call at ports where biofouling regulation has been adopted.

34 These comments reiterate the answers in the survey and indicate that standardization in biofouling and more in-water cleaning facilities are needed.

Conclusion

35 It is encouraging to note that most of the respondents are following the Biofouling Guidelines. Further, almost every respondent had biofouling management in place and many respondents have taken niche area cleaning into consideration.

36 To attain the right balance with in-water cleaning frequency, ships are dependent on access to safe and environmentally sustainable cleaning facilities on a global basis. If cleaning is not conducted frequently enough there is a risk of spreading IAS and increasing GHG emissions owing to the build of drag. On the other hand, if cleaning is conducted too often there is a risk of wasting resources and decreasing the performance of the ship's AFS. It is thus essential that coastal States provide the necessary in-water cleaning facilities.

Action requested of the Sub-Committee

37 The Sub-Committee is invited to note the above information and take action as appropriate.

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ANNEX

BIOFOULING SURVEY QUESTIONNAIRE

The following questions were asked to the participants of the survey:

Q 1: How many ships do your company manage, own and/or operate?

Q 2: What antifouling coating system(s) do you use? Please select all the ones that apply.

- Biocidal coating, e.g. Self-Polishing Copolymer (SPC)
- Foul release coating, e.g. silicone
- Hard coating, e.g. biotechnology
- Others (please specify)

Q 3: On average, what is the planned service life of the antifouling coating system applied? Please state the number of years in the below sub-questions

Q 3.1: Biocidal coating, e.g. Self-Polishing Copolymer (SPC)
Q 3.2: Foul release coating, e.g. silicone
Q 3.3: Hard coating, e.g. biotechnology
Q 3.4: Other systems

Q 4: Does your company monitor the performance of the antifouling coating systems on ships? If yes: please indicate how the performance is monitored. Please select all that apply.

- No
- Regular in-water hull inspections while in service
- Analysis of manually collected (speed/consumption) data based on noon report data
- Analysis of automatically collected high frequency data
- Systematic assessment and rating of hull condition during dry dockings
- Use of ISO standard 19030 on hull and propeller performance
- Others, please specify

Q 5: Do your ships have a biofouling management plan? If yes, is it part of:

- The ship's operational procedures and documentation (Safety Management System under the ISM Code)?
- The ship's Planned Maintenance System (PMS)?
- Others, please specify

Q 6: Does the biofouling management plan take trade into consideration local regulations/recommendations etc.? Please select all that apply.

- USCG regulations
- California regulations
- New Zealand regulations
- Australia regulations
- IMO recommendations
- Others, please specify

Q 7: When are you undertaking in-water inspections? Please select all that apply:

- Never
- Regularly in accordance with the biofouling management plan
- In accordance with contractual specifications
- When regulations are enforcing it
- In connection with a planned period of inactivity
- Before and after a significant change to the ship's operating or trading profile
- After a prolonged period at the roads
- After determining the presence of biofouling of concern on the ship's hull
- Following damage to, or premature failure of, the antifouling system
- Others, please specify

Q 8: When are you undertaking in-water cleaning of the hull? Select all that apply:

- Never
- As a result of in-water inspections
- In accordance with calculations showing increased drag
- Regularly at preselected interval
- Others, please specify

Q 9: Do you choose cleaning techniques that minimize degradation of the antifouling coating and/or biocide release?

- Yes
- No
- Comments

Q 10: Do you clean niche areas?

- Yes
- No
- Comments

Q 11: Do you use and maintain a Biofouling Record Book? If yes, does it include information about:

- Dry-docking cleaning, coating repairs and/or re-coating?
- Inspections by divers and their observations of biofouling percentage coverages?
- In-water hull cleanings?
- In-water niche area cleanings?
- In-water propeller cleanings?
- Extended periods of time when the ship was idle or laid up?
- Periods of time when ship was operating outside its normal trading profile?
- Monitoring of seawater temperatures?
- Others, please specify

Finally, what is the name of your company?
What is your position in the company?
Do you have other comments you want to share?