



# MES

Maritime Engineering & Solutions

# GREEN\_SHIPPING\_ENGINEERING

10/2020

## our services

evaluations & feasibility studies

3D high-resolution laser scan and survey

engineering

project supervision

class & flag state approvals



## our solutions

ballast water treatment

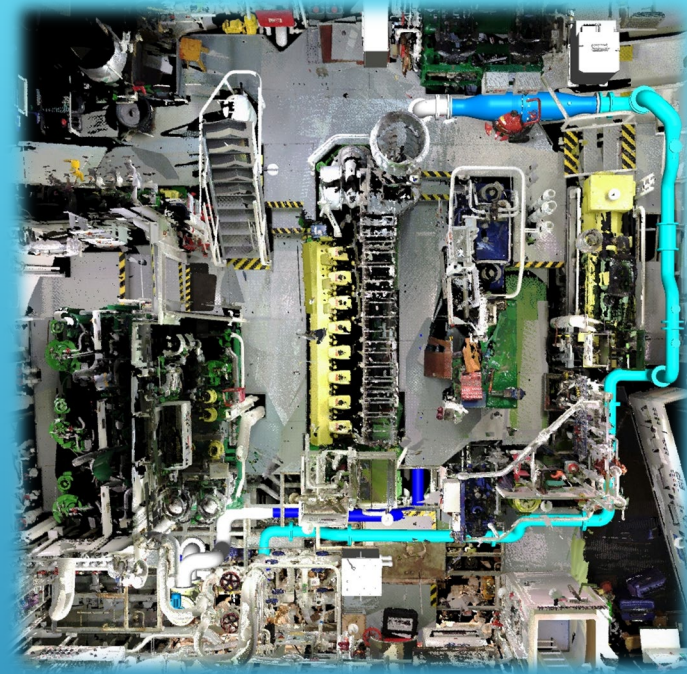
exhaust gas cleaning

energy efficiency

bio fouling

noise pollution

HEPA filter retrofit



## bio fouling – vessel hull

IMO guidelines

Regulatory considerations

Operational considerations



prevention of adverse impacts from the use of **anti-fouling systems** and the biocides they may contain

minimize the transfer of invasive aquatic species

## IMO guidelines

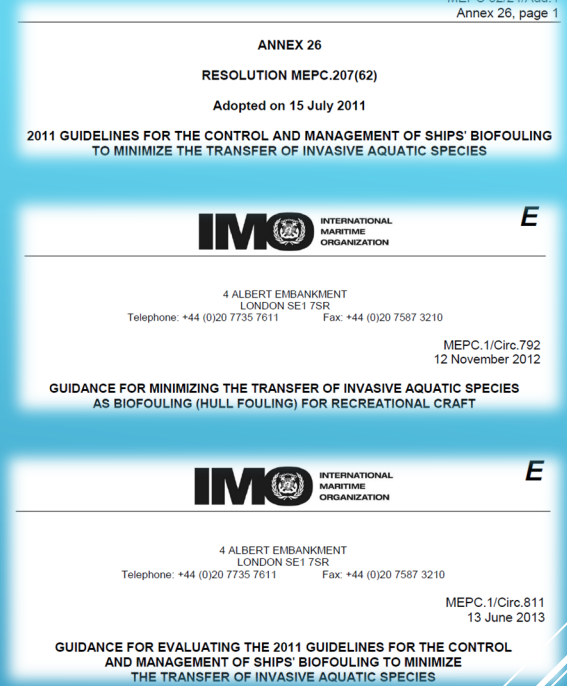
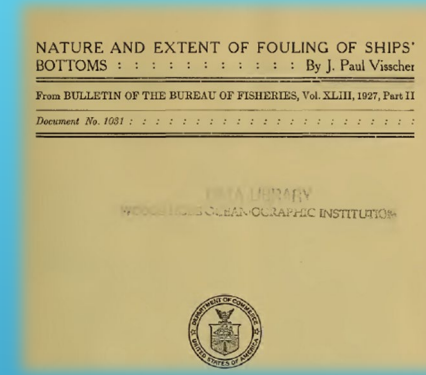
1927: early recognition by e.g. US Navy

2006: issue of the transfer of invasive aquatic species through ships' biofouling

2012: guidance for minimizing the transfer of invasive aquatic species as biofouling (hull fouling) for recreational craft

2013: guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species

2016: additional benefits from managing biofouling



prevention of adverse impacts from the use of **anti-fouling systems** and the biocides they may contain  
 minimize the transfer of invasive aquatic species  
 approving regulatory compliance

## Biofouling Management Plan

The purpose of the Plan is to outline measures for the control and management of this vessel's biofouling to minimize the transfer of invasive aquatic species.

Ship's name	Xxx
Flag	Xxx
Port of registry	Xxx
Gross tonnage	Xxx
IMO number	Xxx
Length	Xxx
Beam	Xxx
Ship type	Xxx
Call sign	Xxx

**Guidance Note**  
 This is a guidance note for the author/editor of this Plan. Please delete the whole text at this page before completing the ship specific Biofouling Management Plan.

Please review IMO Resolution [MEPC.207\(62\)](#), which is a guidance for what to include in a Biofouling Management Plan.

The Biofouling Management Plan shall be ship-specific and it is not recommended to cut/paste voluminous paragraphs from MEPC.207(62) into the Plan. The MEPC.207(62) is a guide on what to include and not what to write letter by letter. For such contents, please consider making references to MEPC.207(62) instead.

It is recommended that MEPC.207(62) is attached as appendix to the ship-specific Biofouling Management Plan.

Reference is made to USCG Regulation 33 CFR Part 151 ([link](#)). USCG requires as of 21 June 2012 the following:

33 CFR §151.2050 (e) and (f)  
 (e) **Remove anchors and anchor chains** when the anchor is retrieved to remove organisms and sediments at these places of origin.  
 (f) **Remove fouling organisms from the vessel's hull, piping, and tanks** on a regular basis and dispose of any removed substances in accordance with local, State and Federal regulations.

33 CFR §151.2050 (g)  
**Maintain a ballast water management (BWM) plan** that has been developed specifically for the vessel and that will allow those responsible for the plan's implementation to understand and follow the vessel's BWM strategy and comply with the requirements of this subpart. **The plan must include:**  
 (1) ...  
 (2) ...  
 (3) **Detailed fouling maintenance** and sediment removal procedures.

The vessel's procedures for fouling maintenance can be described directly in the BWM Plan and such procedures then should focus on the items highlighted above.

A second option is to have a separate Biofouling Management Plan, and refer to such in the BWM Plan. The ship management has to decide these approach (if trading to US ports).

Please review all text and change as found appropriate. Yellow highlights indicate information to be added. Grey text indicates guidance from MEPC.207(62) on what to include.

DNV GL  
 Maritime Approval Centre, Høvik, Norway  
 Environmental Protection ([MCANO335@dnvgl.com](mailto:MCANO335@dnvgl.com))

## regulatory considerations

biofouling management plan (MEPC.207(62))

corrosion protection as a safety aspect

various projects, e.g. DNV-GL GloFouling Partnership project

specific class note; e.g., DNV-GL 'ENVIRONMENTAL CLASS - CLEAN'

type-approved solutions

anti-fouling system installation and maintenance

Certificate number	Product name	Expires	Company
✓ TAK00001YT	EgisMaster	2025-10-13	KCC Corporation, Ulsan Plant
✓ TAK00001YK	KÖSTER MPC Antifouling	2025-10-06	KÖSTER BAUCHEMIE AG
✓ TAK00001Y9	Intersmooth 7200Si SPC	2025-09-17	International Paint Limited
✓ TAK00001Y3	SeaQuantum AF 393	2025-09-16	Jotun A/S
✓ TAK0000021	SEAFLO NEO-S PREMIUM	2025-09-15	Chugoku Marine Paints, Ltd. (Hiroshima Head Office)
✓ TAK00001XN	FASTAR I, FASTAR II, FASTAR XI, FASTAR XII,...	2025-08-30	Nippon Paint Marine Coatings Co., Ltd.
✓ TAK00001WR	Intersleek 970	2025-08-10	International Paint Limited
✓ TAK00001VD	SeaQuest Endura	2025-02-13	Jotun A/S
✓ TAK00001V7	SeaQuantum Pro Ace	2025-02-02	Jotun A/S
✓ TAK00001V6	SeaForce Active Ace	2025-02-02	Jotun A/S

prevention of hull and ship efficiency losses

prevention of hull & propeller corrosion

prevention of adverse impacts from the use of **anti-fouling systems** and the biocides they may contain

minimize the transfer of invasive aquatic species

In-water inspections, cleaning & maintenance

## operational considerations

vessel hull, propeller, sea-water pipes, ballast tanks, boiler, cooler, etc.

Biofouling Management Plan (MEPC.207(62))

corrosion protection

biofouling and biofilm protection

compliance

proof of solution

CAPEX / CAPEX / RoI

hull & maintenance operations at **drydock**

- hull preparation
- hull treatment
- hull painting
- sacrificial anodes
- propeller & bow thrusters
- sea chest

silicone vs. antifouling coatings

ultra-sonic biofilm prevention

anodes

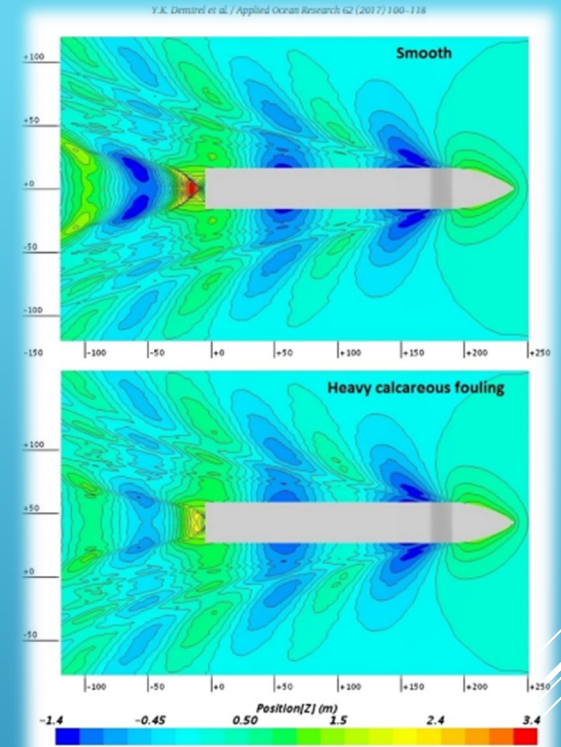


Fig. 16. Wave pattern around the KCS for smooth and heavy calcareous fouling conditions ( $V=24$  knots).



# MES

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