

Green Marine
Europe
Environmental
Program

2019



Performance
Indicators for
Ship owners

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1. AQUATIC INVASIVE SPECIES

OBJECTIVE: Reduce the risk of introducing and propagating aquatic invasive organisms and pathogens associated with ballast water discharges and biofouling.

NON-APPLICABILITY: This indicator does not apply to companies operating ships which pose no risk of introducing or propagating aquatic invasive species through the intermediary of ballast water (e.g. ships which do not use ballast, short haul ferries, barges, etc.).

LEVEL 1

Monitoring of regulations

LEVEL 2

2.1. Minimize or whenever possible avoid uptake of ballast water in the following conditions:

- In shallow water;
- In areas close to sewage outflows;
- In areas with known epidemics or infestations;
- In areas where dredging operations are underway;
- In areas where tidal flushing is poor;
- In areas identified by regulatory authorities.

Note: These measures should include any specific regulations applicable in ports or transit areas.

2.2. Uptake only the minimum amount of ballast water required to safely depart the dock, and complete ballasting operations in deeper waters (while always ensuring the safety of the vessel).

2.3. Develop and implement preventive voluntary measures if EU national / EU port authorities determine that a harmful species has established itself in a particular port.

2.4. Periodically inspect vessels' hulls including niche areas, such as sea chests, propeller thrusters, keels, rudders, and dry dock support strips.

Note: Refer to 2011 IMO Biofouling Guidelines Sections 1.4, 7.2, 7.3, and 7.4. A copy can be found in the Members section of the Green Marine website.

2.5. If needed, remove biofouling organisms from the hull, propellers, stern tube, sea chests, and other wetted portions of a vessel.

Note: Cleaning is suggested if biofouling covers over 15% of the wetted surfaces. At 15% coverage, the vessel is considered extensively fouled. Diagrams to help estimate percent coverage can be found in the Members section of the Green Marine website.

2.6. For each vessel, keep a record book on details of all inspections and biofouling management measures undertaken on the ship.

Note: A template of such a record book can be found in the Members section of the Green Marine website.

LEVEL 3

3.1. Maintain a Ballast Water Management plan and Biofouling Management plan for each vessel which includes all the best practices required to achieve Level 2. Have a policy to support scientific research (3.2).

Note: A Biofouling Management plan template can be found in the Members section of the Green Marine website.

3.2. Support scientific research on ballast water or biofouling by providing access to ships for sampling by governmental and research groups.

Note: It is not necessary to actively participate in the research program in order to fulfill this criterion.

3.3. Complete and maintain an annual inventory to evaluate the amount of ballast water taken and discharged by the company's ships by origin/destination.

Note: See Annex 1-A.

3.4. Produce an annual report showing any cases where the Port State Control issues a fine or warning for improper ballast exchange or reporting. For such cases, include root cause(s) and preventive action(s) taken.

For vessels with antifouling coating:

3.5. Within dry-docking specifications, select coating with effective coating lifespan in line with schedule for next dry-docking and anticipating operational wear, such as contact with lock walls or abrasive cleaning.

Note: The effective coating lifespan is determined by the manufacturer based on the vessel-specific application scheme (e.g. coating thickness); it is the age of an anti-fouling coating after which the coating is no longer expected to satisfactorily prevent or deter the attachment and growth of biofouling organisms.

LEVEL 4

Fulfill one of the following 3 criteria:

4.1. Actively participate in the development and trial of a ballast water treatment method (mechanical, physical, or chemical) on one or several of the company's vessels.

OR

4.2. Actively participate in research on reducing the risk of AIS introduction and spread associated with ballast water operations and discharges.

OR

4.3. Actively participate in research for ecofriendly biofouling paints and antifouling systems and on reducing the risk of AIS via biofouling, for example - autonomous underwater cleaning or underwater cleaning reclamation (vacuum or other control technologies).

Note: Active participation is defined as the provision of support by the company, whether through financial means, human resources or equipment and can include an experimental shipboard trial.

LEVEL 5

5.1. Install and use a ballast water treatment system on one or several of the company's vessels. And, for each installed and in-use system, adopt contingency measures, as per MEPC 71/WP.9 Annex 4.

Note: See "Links to Ballast water Regulations" document in the Members section of the Green Marine website for reference and links to regulations.

2. POLLUTANT AIR EMISSIONS - SO_x AND PM

OBJECTIVE: Reduce pollutant air emissions of sulphur oxides (SO_x) and particulate matter (PM).

LEVEL 1
Monitoring of regulations
LEVEL 2
<p>2.1. Implement a systematic control policy for documenting fuel (bunker notes). <u>Note:</u> Bunker notes must be conserved and annual consumption notes must be kept for each ship.</p> <p>2.2. Use climatology and weather forecasting to take advantage of tidal currents and avoid storms. Plan voyages to reduce running hours and idling time.</p> <p>2.3. Optimize trim for fuel efficiency when loading ships and barges.</p> <p>2.4. Follow voluntary slow speed measure in specific zones, as identified by port or governmental authority. <u>Note :</u> the identified zones are Particularly Sensitive Sea Areas (PSSA) : http://www.imo.org/en/OurWork/Environment/PSSAs/Pages/Default.aspx</p> <p>2.5. Implement a preventive engine maintenance system in order to optimize performance.</p> <p>2.6. Identify optimal engine speed or engine load for fuel efficiency. Inform crew and ensure awareness of this optimal 'economic' speed or engine load. Transit at this speed or load to the extent practicable.</p> <p>2.7. Implement a replacement program for LED or other energy efficiency light upgrades.</p> <p><u>Tugs Only:</u></p> <p>2.8. Reduce tug idling with dispatch scheduling and/or providing tie-up locations where awaiting tow or escort.</p>
LEVEL 3
<p>3.1. Complete an annual inventory of SO_x and particulate matter (PM) emissions for all the company's ships. <u>Note:</u> See Annexes 2-A, 2-B, and 2-D.</p> <p>3.2. The average sulphur content by mass of the total amount of fuel consumed annually by all of the company's vessels is less than 2.5%. <u>Note:</u> Fuel sulphur limit is 0.1 % within an ECA and 3.5 % outside ECAs. <u>Note:</u> the requirement is not applicable for ship owners operating in ECAs only. <u>Note:</u> ship owners can use equipment or alternative fuel allowing for the attainment of the same level of sulphur emissions as above.</p> <p>3.3. In ports: use a fuel with a sulphur content equal to or less than ≤ 0.5 % (or equivalent by scrubbing) or shore power for one or more of the company's ships when such ships are docked.</p>
LEVEL 4
<p>4.1. The average sulphur content by mass of the total amount of fuel consumed annually by all of the company's vessels is less than 2.2%. <u>Note:</u> ship owners can use equipment or alternative fuel allowing for the attainment of the same level of sulphur emissions as above.</p> <p>4.2. In ports: use a fuel with a sulphur content equal to or less than ≤ 0.5 % (or equivalent by EGCS) or shore power for at least 50%+1 of the company's ships (50%+1 of the ships representing at least 30% of the gross tonnage).</p> <p>AND (all ship owners), fulfill one of the following 2 criteria:</p> <p>4.3. Sample PM emissions for one of the fleet's main engine types (slow-speed, medium-speed, high-speed, gas or steam turbine). <u>Note:</u> Sampling must be repeated every five (5) years. The sampling test plan must be consistent within the fleet, comparable with prior tests, and a recognized methodology, such as ISO 8178 or 40 CFR 51 Appendix M and 40 CFR 60 Appendix A.</p> <p>OR</p> <p>4.4. Actively participate in research and development on reducing the impact of SO_x and PM emissions, for example – improving inventory tools, developing hybrid or blended fuels, or conducting a pilot project on emission reduction technologies. <u>Note:</u> Active participation is defined as the provision of support by the company, whether through financial means, human resources or equipment and can include an experimental shipboard trial.</p>
LEVEL 5
<p>5.1. The average sulphur content by mass of the total amount of fuel consumed annually by all of the company's vessels is less than 1.5%. <u>Note:</u> shipowners can use equipment or alternative fuel allowing for the attainment of the same level of sulphur emissions as above.</p> <p>5.2. In ports: use a fuel with a sulphur content equal to or less than ≤ 0.5 % (or equivalent by EGCS) or shore power for 100% of the fleet.</p> <p>5.3. On board one or more of the company's owned ships, compared to no treatment, achieve a 75 % or greater reduction of PM emissions per ship by (i) applying pre-treatment and on-engine measures, (ii) applying after-treatment measures, such as a diesel particulate filter (DPF), diesel oxidation catalysts (DOCs), or other exhaust gas cleaning system (EGCS), (iii) using wind propulsion, or by (iv) using LNG or other energy-solutions having low SO_x&PM emissions</p>

3. POLLUTANT AIR EMISSIONS - NO_x

OBJECTIVE: Reduce pollutant air emissions of nitrogen oxides (NO_x).

LEVEL 1
Monitoring of regulations
LEVEL 2
<p><i>The use of specialized software or of any other verifiable procedure can serve as evidence that the practices below have been implemented.</i></p> <p>2.1. Implement a systematic control policy for documenting fuel (bunker notes). <u>Note:</u> Bunker notes must be conserved and annual consumption notes must be kept for each ship.</p> <p>2.2. Use climatology and weather forecasting to take advantage of tidal currents and avoid storms. Plan voyages to reduce running hours and idling time.</p> <p>2.3. Optimize trim for fuel efficiency when loading ships and barges.</p> <p>2.4. Follow voluntary slow speed measure in specific zones, as identified by port or governmental authority. <u>Note :</u> the identified zones are Particularly Sensitive Sea Areas (PSSA) http://www.imo.org/en/OurWork/Environment/PSSAs/Pages/Default.aspx</p> <p>2.5. Implement a preventive engine maintenance system in order to optimize performance.</p> <p>2.6. Identify optimal engine speed or engine load for fuel efficiency. Inform crew and ensure awareness of this optimal 'economic' speed or engine load. Transit at this speed or load to the extent practicable.</p> <p>2.7. Implement a replacement program for LED or other energy efficiency light upgrades.</p> <p><u>Tugs Only:</u> 2.8. Reduce tug idling with dispatch scheduling and/or providing tie-up locations where awaiting tow or escort.</p>
LEVEL 3
<p>3.1. Complete an annual inventory of NO_x emissions for all the company's ships. <u>Note:</u> See Annexes 2-C and 2-D.</p>
LEVEL 4
<p>4.1. Conduct sampling of NO_x emissions on at least one of the company's ships within the last five (5) years. The sampling test plan must be consistent within the fleet, comparable with prior tests, and a recognized methodology, such as ISO 8178 or IMO NO_x Technical Code 2008.</p> <p>4.2. On board one or more of the company's owned ships, install a higher tier engine than required or use and maintain on-engine or after-treatment NO_x emission reduction technologies, like selective catalytic reduction (SCR) or exhaust gas recirculation (EGR), or methods that result in a 15% reduction of NO_x emissions below the permitted limits. <u>Note:</u> Permitted limits are published in the document 'NO_x emission permitted limits' in the Members section of the Green Marine website.</p>
LEVEL 5
<p>Fulfill one of the following 2 criteria:</p> <p>5.1. On board the majority (50%+1 representing at least 30% of the gross tonnage) of the company's owned ships, install a higher tier engine than required or use and maintain on-engine or after-treatment NO_x emission reduction technologies or methods that result in a 15 % reduction of NO_x emissions per ship below the permitted limits. <u>Note:</u> Permitted limits are published in the document 'NO_x emission permitted limits' in the Members section of the Green Marine website. <u>Note:</u> Under the designation of these NECAs, marine diesel engines installed on board ships built on or after 1 January 2021 and operating in the North Sea and Baltic Sea should comply with the Tier III NO_x emission limits</p> <p>OR</p> <p>5.2. On board one or more of the company's owned ships, achieve a 50% or greater reduction of NO_x emissions per ship below the permitted limits by installing a higher tier engine than required or by using and maintaining NO_x emission reduction technologies.</p>

4. GREENHOUSE GAS EMISSIONS

OBJECTIVE: Reduce greenhouse gas (GHG) emissions.

LEVEL 1
Monitoring of regulations
LEVEL 2
<p><i>The use of specialized software or of any other verifiable procedure can serve as evidence that the practices below have been implemented.</i></p> <p>2.1. Implement a systematic control policy for documenting fuel (bunker notes). <u>Note:</u> Bunker notes must be conserved and annual consumption notes must be kept for each ship.</p> <p>2.2. Use climatology and weather forecasting to take advantage of tidal currents and avoid storms. Plan voyages to reduce running hours and idling time.</p> <p>2.3. Optimize trim for fuel efficiency when loading ships and barges.</p> <p>2.4. Follow voluntary slow speed measure in specific zones, as identified by port or governmental authority. <u>Note :</u> the identified zones are Particularly Sensitive Sea Areas (PSSA) : http://www.imo.org/en/OurWork/Environment/PSSAs/Pages/Default.aspx</p> <p>2.5. Implement a preventive engine maintenance system in order to optimize performance.</p> <p>2.6. Identify optimal engine speed or engine load for fuel efficiency. Inform crew and ensure awareness of this optimal 'economic' speed and/or engine load. Transit at this speed to the extent practicable.</p> <p>2.7. Implement a replacement program for LED or other energy efficiency light upgrades.</p> <p><u>Tugs Only:</u> 2.8. Reduce tug idling with dispatch scheduling and/or providing tie-up locations where awaiting tow or escort.</p>
LEVEL 3
<p>3.1. Complete and disclose an annual GHG emissions inventory (totals and intensity) for the company's entire fleet, including voyages outside Europe. <u>Note:</u> For more information on the calculation of GHG emissions, see the Commission Implementing Regulation (EU) 2016/1927 on templates for monitoring plans, emissions reports and documents of compliance pursuant to the EU MRV Regulation https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R1927&from=EN</p> <p>3.2. Adopt an Energy Performance plan that has quantifiable objectives and which formally incorporates the best practices required for achievement of level 2. <u>Note:</u> See Annex 3-A.</p>
LEVEL 4
<p>4.1. On the basis of the inventory made in 4.3.1, achieve an annual average reduction in GHG intensity (GHG emissions per tonne-nautical mile or per hour for tugs, passenger vessels, or other non-cargo ships) of 1.0% since 2008. <u>Note:</u> For more information on the calculation of GHG emissions, see the Commission Implementing Regulation (EU) 2016/1927 on templates for monitoring plans, emissions reports and documents of compliance pursuant to the EU MRV Regulation https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R1927&from=EN</p>
LEVEL 5
<p>5.1. On the basis of the inventory made in 4.3.1, achieve an annual average reduction in GHG intensity (GHG emissions per tonne-nautical mile or per hour for tugs, passenger vessels, or other non-cargo ships) of 2.0% since 2008. <u>Note:</u> For more information on the calculation of GHG emissions, see the Commission Implementing Regulation (EU) 2016/1927 on templates for monitoring plans, emissions reports and documents of compliance pursuant to the EU MRV Regulation https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R1927&from=EN</p>

5. OILY DISCHARGE

OBJECTIVE: Minimize risk of oily water discharges.

5.A. OILY DISCHARGE: SHIPS \geq 400 G T

LEVEL 1
Monitoring of regulations
LEVEL 2
<p>Implementation of 6 of the following 9 best practices on all company ships:</p> <p>2.1 Ensure performance of each oily water separator (OWS) by:</p> <p>a) Conduct annual calibration of the oil content meter; or</p> <p>b) Sample treated water monthly and have it analyzed by an accredited lab; or</p> <p>c) Use a secondary calibrated monitoring unit (e.g. white box).</p> <p>2.2. Periodically test oil content alarm prior to operating the oily water separator and in any case at least once a month if the equipment is not used.</p> <p>2.3. Use seals or locks on all overboard discharge valves.</p> <p>2.4. Post signs in the vicinity to clearly indicate who is responsible for opening any of the OWS overboard discharge valves, for operating oily water separation equipment and for oil transfer procedures.</p> <p>2.5. Lock out or seal the oil content meter so that the calibration cannot be tampered with.</p> <p>2.6. Maintain proper coordination with the navigation bridge when opening the overboard discharge valve so a designated officer can also record the activity and the vessel's position.</p> <p>2.7. When feasible, only operate the oily water separator during the daytime.</p> <p>2.8. Regularly clean the applicable bilges and remove any solid material that may reduce the performance of the OWS.</p> <p>2.9. Reduce as much as possible the use of emulsifying cleaners and agents that can degrade the performance of the OWS.</p>
LEVEL 3
<p>3.1. Adopt an Oily Water Management plan that formally incorporates all the best practices itemized in level 2. <u>Note:</u> See Annex 4-A.</p> <p>3.2. Complete an inventory of treated bilge water and sludge. <u>Note:</u> See Annex 4-B.</p>
LEVEL 4
<p>4.1. Adopt a modernization policy for oily water separators and all related control and verification equipment. Systematic application of this policy on all new buildings and all ships undergoing major modifications. <u>Note:</u> See Annex 4-C.</p> <p>Implementation on at least one ship in the company's fleet:</p> <p>4.2. Vessels built after January 1st, 2011: Implement of an integrated bilge treatment system such as that defined in the IMO's revised guidelines (MEPC.1/Circ.642, 12 November 2008).</p> <p>OR</p> <p>4.3. Vessels built before 2011: Demonstrate of an integrated bilge treatment system approach by respecting the requirements defined in Annex 4-D. <u>Note:</u> See Annex 4-D.</p>
LEVEL 5
<p>On the majority of the company's ships (50%+1 of vessels representing at least 30% of the gross tonnage) :</p> <p>5.1. Vessels built after January 1st, 2011: Implement an integrated bilge treatment system such as that defined in the IMO's revised guidelines (MEPC.1/Circ.642, 12 November 2008).</p> <p>OR</p> <p>5.2. Vessels built before 2011: Demonstrate an integrated bilge treatment system approach by respecting the requirements defined in Annex 4-D. <u>Note:</u> See Annex 4-D.</p>

5.B. OILY DISCHARGE: SHIPS < 400 GT

LEVEL 1	
Monitoring of regulations	
LEVEL 2	
<p>Vessels using an Oily Water Separator (OWS) on board: <u>Implementation of 6 of the following 9 best practices on all company ships:</u></p> <p>2.1. Ensure performance of each oily water separator (OWS) by: a) Conduct annual calibration of the oil content meter; or b) Sample treated water monthly and have it analyzed by an accredited lab; or c) Use a secondary calibrated monitoring unit (e.g. white box).</p> <p>2.2. Periodically test oil content alarm prior to operating the oily water separator and in any case at least once a month if the equipment is not used.</p> <p>2.3. Use seals, locks or automatic shut-off device on all overboard discharge valves of vessels.</p> <p>2.4. Post signs in the vicinity to clearly indicate who is responsible for opening any of the OWS overboard discharge valves and for operating oily water separation equipment.</p> <p>2.5. Lock out or seal the oil content meter so that the calibration cannot be tampered with.</p> <p>2.6. Maintain proper coordination with the navigation bridge when opening the overboard discharge valve so a designated officer can also record the activity and the vessel's position.</p> <p>2.7. When feasible, only operate the oily water separator during the daytime.</p> <p>2.8. Regularly clean the applicable bilges and remove any solid material that may reduce the performance of the OWS.</p> <p>2.9. Reduce as much as possible the use of emulsifying cleaners and agents that can impact the performance of the OWS equipment.</p>	<p>Vessels NOT using Oily Water Separator (OWS) on board: <u>Implementation of 5 of the following 9 best practices on all company's ships:</u></p> <p>2.10. Regularly inspect and perform preventative maintenance of equipment using oil (an engine, burners, pumps, heaters, filters, etc.) or water (condensers, boilers, pumps, etc.) to prevent leaks. <u>Note:</u> inspections should be done at least in line with manufacturers recommendations</p> <p>2.11. Regularly inspect and maintain stern tube seals and bearings to prevent water from entering. <u>Note:</u> inspections should be done at least annually.</p> <p>2.12. Stop leaks of oil or water in the engine room as soon as possible.</p> <p>2.13. Clean up oil and water spills as soon as possible after maintenance and repair operations.</p> <p>2.14. Regularly clean and inspect bilge pump system to ensure proper functioning. <u>Note:</u> inspections should be done at least annually.</p> <p>2.15. Regularly clean bilges and remove any solid material. <u>Note:</u> inspections should be done at least annually.</p> <p>2.16. Post signs in the vicinity to clearly indicate who is responsible for bilge water transfer procedures.</p> <p>2.17. Give staff proper training on bilge water transfer procedures.</p> <p>2.18. Keep available on board oil absorption pads to intervene in case of minor oil spills.</p>
LEVEL 3	
<p>3.1. Adopt an Oily Water Management plan that formally incorporates all the best practices itemized in level 2. <u>Note:</u> See Annex 4-A.</p> <p>3.2. Complete an annual inventory of bilge water (produced, treated, discharged to sea, and off-loaded to shore, as applicable) and of oil residue (sludge) on a vessel by vessel basis and for the fleet as a whole. <u>Note:</u> See Annex 4-B.</p>	
LEVEL 4	
<p>4.1. Set reduction targets (for the fleet as a whole or by vessel category) for bilge water produced.</p> <p>4.2. Implement effective measures to reduce the quantity of bilge water and sludge produced on 50 % of the company's vessels targeted for reduction. Examples: Separate drainage systems for water and oil drains, installation of drip trays or coamings under equipment, use less water for maintenance and cleaning, replacement and repair of stern tube seals, etc.).</p>	
LEVEL 5	
<p>5.1. Implement effective measures to reduce the quantity of bilge water and sludge produced on 75 % of the company's vessels targeted for reduction. Examples: Separate drainage systems for water and oil drains, installation of drip trays or coamings under equipment, use less water for maintenance and cleaning, replacement and repair of stern tube seals, etc.).</p> <p>5.2. Demonstrate an annual reduction of the quantity of bilge water and/or sludge produced (intensity unit is to be determined by the company, e.g. tonnes/hour of operation).</p>	

6. WASTE MANAGEMENT

OBJECTIVE: Reduce ship generated waste.

APPLICABILITY: This performance indicator only applies to the company's owned vessels.

LEVEL 1
Monitoring of regulations
LEVEL 2
<p>2.1. Equip all of the company's ships with recycling bins and give staff proper training on established user procedures and the waste management hierarchy (reduce, reuse, recycle, recovery, disposal).</p> <p>2.2. Favor suppliers that use less packaging.</p> <p>2.3. Encourage the use of reusable, and/or recyclable supplies. <u>Note:</u> Biodegradable supplies could be considered if no other possibility.</p> <p>2.4. No shipboard incineration at port.</p> <p><u>Applicable only to vessels carrying cargoes not in bulk and performing regularly consecutive voyages:</u></p> <p>2.5. Reuse as much as possible dunnage, lining and packaging material.</p>
LEVEL 3
<p>3.1. Produce an annual inventory of different types of garbage generated in the company's entire fleet, and indicate the company's actual garbage management practices. <u>Note:</u> Garbage types refer to the categories defined in MARPOL Annex V, but each company can include additional categories.</p>
LEVEL 4
<p>4.1. Develop and implement a garbage management strategy defining targets, tools and measures for reducing garbage generated, reducing discharge at sea and increasing recycling. <u>Note:</u> See Annex 5-A.</p> <p>4.2. Provide in-house training and raise awareness for crew and ground personnel on waste prevention to facilitate waste reduction, sorting, reuse and possible recycling.</p> <p><u>Passenger ship only:</u></p> <p>4.3. Implement an awareness campaign for passengers on waste prevention to facilitate waste reduction, reuse and possible recycling.</p>
LEVEL 5
<p>5.1. Demonstrate continual improvement by achieving targets defined in the garbage management strategy.</p> <p><u>Ships using EGCS only:</u></p> <p>5.2. Implement one of the two following best practices:</p> <p>a) Participate in a study to assess the environmental impacts of waste water discharged from open loop EGCS, including measures to address possible impacts,</p> <p>b) Waste generated by EGCS to be discharged ashore via approved suppliers</p>

7. UNDERWATER NOISE

OBJECTIVE

Reduce underwater noise made by ship operations to reduce impacts to marine mammals.

NOTES:

- Green Marine recognizes that underwater noise may potentially impact a broader range of aquatic species other than just marine mammals. While the initial objective of this indicator covers marine mammals, future development of this Performance Indicator may expand its scope.
- Green Marine recognizes that for most ships, under most operational conditions, cavitation is the main source of underwater noise.
- Applicable only for vessels transiting in salt water.

LEVEL 1
Monitoring of regulations
LEVEL 2
<p>2.1. Conduct regular hull cleaning and propeller blade maintenance. The candidate must keep a record of these actions for each vessel in their fleet. <u>Note:</u> Hull cleaning and propeller maintenance should at least be done during dry dock.</p> <p>2.2. Review the list of sensitive areas in Canadian, US and EU waters to determine whether the candidate's vessels transit through or have operations in such areas. Ensure that this information is communicated to each vessel. <u>Note:</u> See Annex 6-A.</p>
LEVEL 3
<p>3.1. Actively participate in providing whale sighting data in European waters through a logbook, a recognized application such as a European version of the US app Whale Alert or the REPCET system (outside mandatory zones for French ship owners). <u>Note:</u> If sightings are recorded in a logbook, the data should be shared with a recognized central database.</p> <p>3.2. Develop and adopt a Marine Mammal Management plan (MMMP) in order to reduce the potential adverse effects of vessels, especially within known sensitive marine areas, as identified in Criterion 2.2. <u>Note:</u> See Annex 6-B.</p>
LEVEL 4
<p>4.1. Incorporate applicable vessel quieting technologies during retrofits and new vessel construction. <u>Note:</u> Refer to published documents like the IMO and the SNAME MVEP Guidelines, available in the Members section of the Green Marine website. This criterion is applicable only for ship owners ordering/designing new vessels (keel laid after Jan 2018) or conducting retrofits of propulsion systems or other equipment that contributes significantly to underwater noise.</p> <p>AND, fulfill one of the following 3 criteria:</p> <p>4.2. Work with ports to estimate relative ship noise levels for at least one vessel in their fleet. It is recommended to start by the oldest vessels of the fleet (by year of construction) or by sisterships.</p> <p>OR</p> <p>4.3. In line with IMO recommendations, estimate relative ship noise levels of at least one vessel in their fleet by using a dedicated hydrophone. It is recommended to start by the oldest vessels of the fleet (by year of construction) or by sisterships. <u>Note:</u> Collaboration with a bioacoustician is essential to obtain reliable data.</p> <p>OR</p> <p>4.4. Support / collaborate on scientific research on underwater noise allowing the estimation of relative ship noise levels for at least one vessel in their fleet.</p> <p>AND, fulfill the following criterion:</p> <p>4.5. Determine the cavitation inception speed (CIS) for each vessel in the fleet. <u>Note:</u> This criterion is only applicable for vessels equipped with a Fixed Pitch Propeller (FPP).</p>

LEVEL 5

Fulfill one of the following 3 criteria:

5.1. Work with ports to estimate relative ship noise levels for 15% of the vessels in their fleet representing at least 10% of the gross tonnage, with a minimum of 3 vessels measured. It is recommended to start by the oldest vessels of the fleet (by year of construction) or by sisterships.

OR

5.2. In line with IMO recommendations, estimate relative ship noise levels of 15% of the vessels in their fleet representing at least 10% of the gross tonnage, with a minimum of 3 vessels measured, using a dedicated hydrophone. It is recommended to start by the oldest vessels of the fleet (by year of construction) or by sisterships.

Note: Collaboration with a bioacoustician is essential to obtain reliable data.

OR

5.3. Support / collaborate on scientific research on underwater noise allowing the estimation of relative ship noise levels for 15% of the vessels in their fleet representing at least 10% of the gross tonnage, with a minimum of 3 vessels measured.

AND, fulfill the following criterion:

5.4. Proceed to an in-depth analysis of vessel noise footprint on at least one ship in order to identify main noise sources. It is recommended to start by the oldest vessels of the fleet (by year of construction) or by sisterships. Solutions to be identified and implemented to reduce noise output.

Note: ISO 17208-2:2019 underwater noise standard measurement methodology should be used where at all possible.