IDWAL

TECHNICAL GUIDE

Pollution Control

Idwal 2022

Contents

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Pollution Control

This section largely deals with how the vessel's crew and management comply with the International Convention for the Prevention of Pollution from Ships (MARPOL) and the regulations laid out in its annexes.

Was Pollution Control well implemented within the on-board Safety Management System (SMS)?

Were the procedures and guidance in the vessel's SMS relating to environmental management followed by the crew on board? E.g., Were cleaning substances, paint, oil etc. correctly disposed of? Were SOPEP drills regularly conducted? Was there a robust set of instructions and procedures within the SMS that covered all types of environmental risk from the work and operations conducted on board? Was there guidance and procedures relating to all Annexes or MARPOL? etc.

Is the vessel free of pollution hazards?

Was any evidence received that the vessel was discharging unauthorised materials of any kind to the sea, including petrochemicals (oil, fuel etc), noxious substances (chemicals) and garbage? Also the risk of such an event taking place should be considered, such as save-alls which have oil or fuel in them or badly stored garbage on a weather deck. Were there any potential sources of leakage or pollution that could affect the marine environment or atmosphere?

Yes, with no hazards seen.

Fair with a few hazards- minor issues such as some oil being seen in save alls.

No with serval hazards- more than one issue/ pollution event appears to be imminent.

Selecting the bottom 2 boxes will bring up a free text box to describe the hazard, please ensure clear labelled photographs are placed in the defect folder and in the pollution control folder.

Were scuppers plugged in port as required?

It might be a requirement of the vessel's SMS or a port authority to have scuppers plugged in port or while undertaking bunkering operations or loading chemicals or oil products in bulk. It is considered industry best practice to have scuppers plugged all the time in port in case of incidents such as tanks overflowing. If any hydraulic deck equipment is in use scuppers are expected to be in place. Some ports may allow scuppers to be removed during heavy weather or when no operations are in progress. Selecting 'No' for the answer will bring up a free text box to elaborate with further information. Please ascertain from the crew the reason why scupper plugs have not been used.

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Does the vessel have a Class approved Inventory of Hazardous Materials (IHM)?

An Inventory of Hazardous Materials (IHM) statement of compliance approved both to 2009 Hong Kong convention and the EU Reg. 1257/2013 should be available onboard to be sighted and is an Idwal requested document. Confirmation of IHM approval may also be seen as a Class notation. Please note that we require certification after the confirmation certificate not the inventory itself.

Is an Oily Water Separator (OWS) fitted?

Most vessels use an Oily Water Separator to reduce the oil content of bilge water to below 15ppm before it can be discharged overboard. The OWS and bilge processing systems must be verified and regularly calibrated, and all usage recorded in the Oil Record Book. Oily Water Separators come in two general types, static and centrifugal. Not all vessels are fitted with an OWS, however, as some smaller vessels use a bilge water tank to store bilge water and discharge ashore periodically. Whether the vessel has an OWS can be verified in the Supplement to the International Oil Pollution Prevention Certificate (Form A), as well as being sighted within the engine room.

Static OWS

Centrifugal OWS

Was the OWS reportedly operational?

This can be validated with a conversation with the engineering department as well as being sighted within the Oil Record Book (ORB). All failures or malfunctions of the OWS must be recorded in the ORB.

What was the condition of the OWS?

Were there any leaks or deteriorated pipework and could operational panels and gauges be read? The equipment should be clean and free of any signs of previous leaks or overflows. If the OWS was tested, were there any abnormal sounds or vibrations that may indicate a malfunction.

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Was the OWS tested?

The tests can be either simulated or operational. A simulated test would involve flushing the Oil Content Meter (OCM) with clean water until the display showed 0ppm, then inserting a probe or cleaning brush into the chamber to increase the ppm to above 15ppm and witnessing the automatic three-way valve changing over to the recirculation position.

An operational test may involve running the OWS, with the manual three-way valve at the overboard discharge moved to the tank (Recirculating) position, then witnessing the OWS as it reduces the PPM of the bilge water and ensuring that the pumps and sensors are all working correctly.

Was the 15ppm meter calibrated?

Please refer to manufacturer's manual as to required calibration intervals. However, this should not exceed 5 years. Please insert the date of the last calibration. This can be found on the IOPP Supplement, Class status report or a seal/sticker on the OCM. The certificate of calibration should be posted near the OWS.

Was the Bilge Overboard valve secured against unauthorised opening with adequate signage and warnings posted?

It is good practice to ensure that the bilge overboard valve cannot be opened without the knowledge of the Chief Engineer. It is therefore prudent to seal and/or lock the overboard valve to prevent unauthorised opening. Adequate signage should be posted near the overboard valve informing of the consequences of unauthorised opening and discharging of bilge water.

If "No" is selected a free text box will appear, please provide some further information in the box about why the overboard valve was not secured.

Was the oily water treatment system including valves and pipework free of any signs of tampering, bypass, or modifications?

Tampering with the approved system, bypassing the OWS or unapproved modifications can result in extensive fines and sanctions, both for vessels and individuals. Indications of bypass or tampering may include flexible hoses kept near the OWS; portable pumps rigged to transfer between the bilge system and other systems, such as the sewage system; line taps, T-pieces and valves welded on to the existing pipework; Methods of adding clean dilution water to the bilge water stream; And broken anti-tamper seals on flanges and covers.

Use of flexible hose to bypass OWS

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Was the SOPEP locker or box well stocked?

Any shortfalls in type or quantity of equipment should be noted, including the PPE for use in an emergency.

What was the condition of the SOPEP equipment?

The SOPEP equipment should be seen to be checked regularly, normally monthly by a responsible officer, with a list posted near the locker/box. Choose a few items at random from the list to check if they are present in the correct quantity. It is common for items to be borrowed from the SOPEP locker for use in maintenance elsewhere on the vessel.

Was a list of SOPEP equipment posted and accurate?

An inventory of the SOPEP equipment on board should be posted in the locker or box. The inventory should be regularly checked and reflect the quantity of equipment found on board. Any shortfalls in type or quantity of equipment should be noted, including the PPE for use in an emergency.

Was the Oil Record Book (ORB) up to date and correctly filled in?

The ORB should be completed in a timely manner after any oil transfer operations. The records should be completed in ink and signed by the officer in charge of the operation. Each completed page should be reviewed and signed by the Master. Tank totals should add up correctly and weekly summaries should be recorded, as well as any failures or malfunctions of oil processing equipment. A full set of guidance on how to correctly complete the ORB can be found at the front of the book.

Were previous bunkering checklists correctly filled out?

The vessel should have checklists to ensure that bunkering operations are safe and free of pollution hazards. These checklists should be completed in line with company procedures and kept after each bunkering operation. Features of the checklists include, dates and times of transfers, officer in charge of the operations, fuel parameters such as sulphur content, viscosity etc. and tank volumes.

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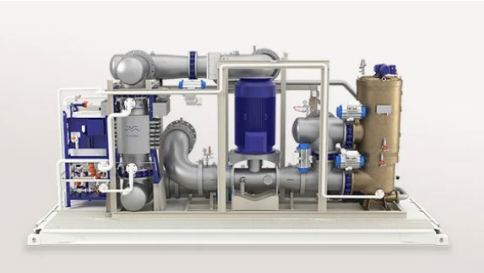
Were bunker samples correctly stored?

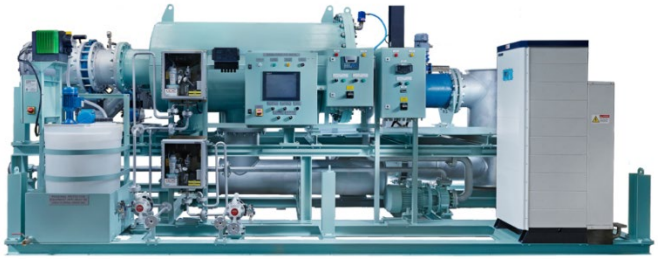
Bunker samples should be stored in cool/ambient temperature, and where they will not be exposed to direct sunlight. The samples should be labelled with the date, location and fuel type. Bunker samples should be stored in an approved area, the paint store is acceptable. Bunkers samples should not be stored near or in the accommodation where any leakage would present a health or fire hazard. A dedicated metal locker is recommended, and sample bottles should be labelled and neat.

Does the vessel have a Ballast Water Treatment System (BWTS) fitted?

A Ballast Water Treatment System is designed to sanitise the ballast water that is pumped on board or discharged to prevent cross contamination of potentially invasive aquatic organisms into incompatible habitats. The systems come in four main types: UV, Electrolysis, Chlorinating and Fine Filtration. These systems have often been retrofitted and are therefore quite obvious. However, newer vessels will have had a BWTS fitted from build. The BWTS is normally found in the Engine Room but may be housed on deck in a dedicated deck house.

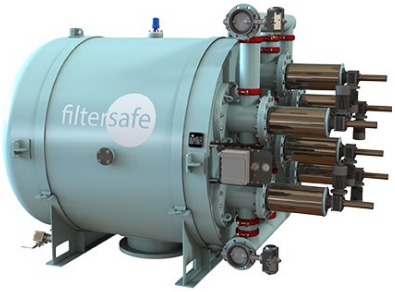


UV BWTS



Electrolysis type BWTS

Chlorinating BWTS



Filtration BWTS

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Ballast Water Treatment System:

Manufacturer and model information can be found in the Ballast Water Management Certificate as well as likely printed on a nameplate on the BWTS itself.

What regulation is listed on the Ballast Water Management Certificate?

There are three types of Ballast Water Management standards:

D1: Ballast Water Exchange Standard - This means that the vessel will perform ballast exchange out of port to avoid contaminating local water etc. The vessel will likely not have a BWTS fitted, or has one fitted, that is not yet commissioned.

D2: Ballast Water Performance Standard - This means the vessel has an approved BWTS fitted and commissioned and should be in use on all ballasting operations.

D4: Prototype Ballast Water Treatment technologies - This is a rare standard, only found in cases where the BWTS fitted is experimental or a prototype, yet to be approved.

Type of BWTS approval:

There are four types of approval that a BWTS can have:

Not approved, IMO approval, USCG approval and USCG Alternate Management System (AMS).

USCG approved and USCG AMS systems are all IMO approved. A full list of the USCG approved equipment can be found via the following link:

https://cgmix.uscg.mil/equipment/equipmentsearch.aspx

Was the BWTS operational?

It may not be possible to witness the BWTS running, therefore a conversation with crew members and a check of the Ballast Water Record Book can be used to verify the operational status of the BWTS.

What was the condition of the BWTS?

A general visual inspection of the equipment, focusing on any current or historic leaks, corrosion, salt build up, malfunctioning gauges and sensors. A cursory check of the systems display panel and alarm log (if accessible) would reveal the presence of any alarms. If any alarms are present then the crew should be able to explain what steps are being taken to resolve them and confirm the systems operational status. Ensure the details are recorded in the checklist.

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Was the Ballast Record Book up to date and correctly filled in?

Guidance on how to correctly fill in the Ballast Record Book can be found at the beginning of the book, but a cursory check that the records are neat and logical and that there are entries within the last two weeks should be sufficient.

Is the Vessel General Permit (VGP) compliant?

The Vessel General Permit is an environmental application and statement that must be completed before entering US waters. To remain VGP compliant, a number of criteria must be met, however in this questions, we are focussing on the stern seal and any bow or stern thrusters. A vessel can be compliant in this regard by using Environmentally Acceptable Lubricants (EALs) at any oil-to-sea interfaces or use an Airseal type stern seal that guarantees no leakage of oil into the sea.

The first step would be to verify the type of stern seal. A “Simplex” seal is not and airseal, and an airseal would have a control unit similar to the below:

Airseal Control Panel

It is important to add a photo of the air seal control unit to the Pollution Control photograph section to assist with verification. Other sources of verification can be the dry dock report or machinery/equipment list.

If the vessel does not have an air seal, then the lube oil analysis report should be checked to verify the type of oil in the stern tube. If it is an EAL, then the stern tube is VGP compliant.

If the vessel does not have an air seal or uses EALs, then it is not VGP compliant with regard to the stern tube.

If the vessel also has any thrusters or has CPP propulsion, then the oils used in these systems/equipment must also be EALs to be VGP compliant.

*How is the vessel VGP Compliant? *Environmentally Acceptable Lubricant”.*

As with the above, this questions asks how the vessel maintains the VGP compliance. Either through the use of EALs or Airseal or combination of both for vessels with thrusters or CPP.

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Was a Sewage Treatment Plant fitted?

Most vessel will have a sewage treatment plant fitted, though some smaller vessels may only have a storage tank.

Aerobic Marine Sewage Treatment plant

Sewage treatment plants generally look like tanks, though they also have air blowers fitted, as well as some pumps. This can also be verified on the Sewage Prevention Certificate.

Was the Sewage Treatment Plant operational?

The sewage treatment plant will likely be running if the vessel is not laid up or in dry dock. Many plants have a waste return tube that is clear on the top of the tank, and there should be visible signs of water moving through this tube. The function of the plant can also be confirmed by conversation with engineering crew members. Additionally, the integrated machinery management system will most likely monitor relevant fault outputs from the treatment system so a check of the engine room alarm list will reveal any current faults on the plant. If the plant is not fully functional, please provide plenty of detail as to the cause of the problem and any potential repair measures being done by the crew.

What was the condition of the Sewage Treatment Plant?

Were there any leaks, temporary repairs, or temporary piping arrangements? Was there any damage or indents to machinery? Were operating panels clear to read and operate?

Does the vessel have a sewage holding tank?

This refers to a dedicated sewage tank as listed on the Sewage Pollution Prevention certificate, and not the tank that is part of the sewage treatment plant. Smaller vessels may only have a dedicated tank and no treatment plant.

What was the condition of the Sewage Holding Tank?

Where there any leaks? any temporary repairs or temporary piping arrangements?

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Does the vessel have a garbage management plan?

A Flag State approved garbage management plan should be on board all vessel over 100 gross tons and is expected to be stowed within a ship's office or where the vessel holds its certification.

How was the condition of Garbage segregation?

All vessels should segregate their garbage in to the following categories:

- A - Plastics
- B - Food wastes
- C - Domestic wastes
- D - Cooking oil
- E - Incinerator ashes
- F - Operational waste
- G - Animal carcass(es)
- H - Fishing gear
- I - E-waste

Appropriate garbage segregation should be seen across the vessel. This will normally form a section of the SMS and an appropriate labelling system should be in places.

Were Garbage containers of approved, non-combustible type?

All garbage containers should be made of non-combustible materials with no openings in the sides or bottom I.e., not wood, with closable lids as per SOLAS Chapter II-2 Regulation 4.4.2.

Was the Garbage Record Book (GRB) up to date and correctly filled in?

Guidance on how to correctly fill in the Garbage Record Book can be found at the beginning of the book, but a cursory check that the records are neat and logical and that there are entries within the last two weeks should be sufficient.

Does the vessel have a valid International Air Pollution Prevention (IAPP) certificate?

This is an Idwal requested document however it should also be sighted on board.

Is the vessel compliant with IMO 2020 Sulphur cap regulations?

Verification on the type of bunker fuel used onboard can be found on the bunker analysis reports or on engine performance reports.

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How does the vessel comply with IMO 2020 regulations?

There are four options here, please select the correct one:

1. Open loop exhaust gas cleaning system (ECGS)
2. Closed loop or hybrid Exhaust gas cleaning system (ECGS)
3. Use of very low sulphur fuel oils (VLSFO, MGO, DO tec.
4. other- this will bring up a free text box

ECGS' are normally obvious as they require a lot of structure on both the deck and engine room. The type can be found in the IAPP supplement.

Does the vessel use Ozone Depleting Substances (ODS) as Refrigerant Gas?

Verification can be found on the International Air Pollution Prevention Certificate supplement. A vessel is also required to carry an ODS record book onboard and this can be used to verify if, what type and where an ODS may be used.

Does it have approved record of ODS equipment?

Where ODS is on board an approved log should be kept and available for inspection. Guidance on how to complete the log can be found at the front of the ODS logbook.

Was an Incinerator fitted?

Verification can be found on the International Air Pollution Prevention Certificate. Photographs of the Incinerator should also be taken clearly showing the condition of the equipment.

These photos are of common incinerators which are often found on the upper deck levels of the funnel casing and/or near the garbage stores.

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Was the Incinerator operational?

Verification can be made verbally with ship's crew and evidence can be sighted with Oil and Garbage Record Books where entries of the last use of the incinerator may be found. It is also not uncommon for an incinerator to be decommissioned by Class or at the request of the owners. In this instance a Class memo may be present or may be reported by the crew.

What was the condition of the Incinerator?

Were there any leaks, temporary repairs or temporary pipework? Was the refractory in good condition? Was the burner sighted to be clean? Were operational panels clear and in working condition? Were incinerator door seals and handles in good condition?

Does the vessel have an Emission Control Area (ECA) change-over log?

Every vessel must carry an approved logbook to record the vessel's entry into and out of and Emission Control Areas (ECAs). This Record book should also state the times and position of the vessel when the vessel changed over to the required fuel before entering the area. For example, an entry would be made showing when the vessel changed over form Heavy Fuel oil to Diesel Oil when entering an ECA, the positions of the vessel at the start and end of the changeover and the sulphur content of both fuels.

EEXI

Does the vessel have an EEDI score assigned at build?

If the vessel is built after 2015, it is highly likely it will have an EEDI score assigned. This score can be found on the International Energy Efficiency certificate supplement and the EEDI Technical File. If possible, please take a digital copy of the EEDI technical file for reference.

What fuel type does the vessel run on for the majority of the time?

If the vessel is not designed to run on an alternative fuel such as LNG, Ammonia, Methanol or Ethanol, then the vessel will be using either Heavy Fuel Oil or Diesel Oil for the majority of the time. Vessels trading coastally will be running on Diesel Oil for the majority of the time, with other vessels running on HFO, apart form when in port or Emission Control Areas. Heavy Fuel Oils include both High Sulphur Fuel Oil and Low Sulphur Fuel Oil. Light Fuel Oils (LFO) is a blend of Diesel and HFO, and is not commonly in use. This information will be included on the Bunker Delivery Note if further clarification is needed.

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Does the vessel have any energy efficiency technologies installed?

Energy Efficiency technologies, as apply to EEXI, come in two types: those fitted to the Hull or Main Engine to reduce the Power required from the Main Engine, or those fitted to the electrical or power distribution systems to reduce the power required from the Auxiliary Engines.

If the vessel is fitted with any of these technologies, it is essential to gather as much information about them as possible. In particular, how often is the technology available for use, and how much power reduction is achieved by the technology. This information may be available in the vessel's Ship Energy Efficiency Management Plan (SEEMP) or from installation and commissioning reports for the technology installed.

This question is linked to the additional design features list in the 'Design and Construction' section of the checklist, therefore, if it is stated that the vessel is fitted with energy efficiency technologies in that section, then this question must also be answered with the required data included.

E.g.,

The vessel is fitted with a Pre-swirl duct:

Pre-swirl device e.g. Mewis Duct	☑ Yes ☐ No	Please provide more information: Pre-swirl duct reduces Main Engine power required at sea by approx 4%, therefore reduction is 385kW.

Then the power reduction due to the Pre-swirl duct must be found and the information completed as follows:

Does the vessel have any energy efficiency technologies installed?	☑ Yes ☐ No	Power reduction due to Energy Efficiency Technologies fitted to the Main Engine(s) or Hull (Peff) (kW):	385.0
		Aux power reduction due to energy efficiency technologies (PAEeff) (kW):	
		What percentage of the time is the energy efficiency technology available? (feff):	%

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Is the vessel ice classed?

The Ice Classes that affect the Vessel's EEXI score are:

IA Super, IA, IB and IC. The Vessel's Ice Class can be found via the Class notations, noted on the Class certificate or the Class Status Report.

Different Class societies have different notations for these Ice Classes, and the following table can assist in identifying the relevant notation:

Classification Society	Ice Class				
Finnish-Swedish Ice Class Rules	**IA Super**	**IA**	**IB**	**IC**	**Category II**
Russian Maritime Register of Shipping (Rules 1995)	UL	L1	L2	L3	L4
Russian Maritime Register of Shipping (Rules 1999)	LU5	LU4	LU3	LU2	LU1
Russian Maritime Register of Shipping (Rules 2008)	Arc 5	Arc 4	Ice 3	Ice 2	Ice 1
American Bureau of Shipping	Ice Class I AA	Ice Class I A	Ice Class I B	Ice Class I C	D0
Bureau Veritas	ICE CLASS IA SUPER	ICE CLASS IA	ICE CLASS IB	ICE CLASS IC	ID
CASPPR, 1972	A	B	C	D	E
China Classification Society	Ice Class B1*	Ice Class B1	Ice Class B2	Ice Class B3	Ice Class B
Det Norske Veritas	ICE-1A*	ICE-1A	ICE-1B	ICE-1C	ICE-C
DNV GL	Ice(1A*)	Ice(1A)	Ice(1B)	Ice(1C)	-
Germanischer Lloyd	E4	E3	E2	E1	E
IACS Polar Rules	PC6	PC7	-	-	-

Korean Register of Shipping	IA Super	IA	IB	IC	ID
Lloyd's Register of Shipping	Ice Class 1AS FS (+) Ice Class 1AS FS	Ice Class 1A FS (+) Ice Class 1A FS	Ice Class 1B FS (+) Ice Class 1B FS	Ice Class 1C FS (+) Ice Class 1C FS	Ice Class 1D Ice Class 1E
Nippon Kaiji Kyokai	NS* (Class IA Super Ice Strengthening) NS (Class IA Super Ice Strengthening)	NS* (Class IA Ice Strengthening) NS (Class IA Ice Strengthening)	NS* (Class IB Ice Strengthening) NS (Class IB Ice Strengthening)	NS* (Class IC Ice Strengthening) NS (Class IC Ice Strengthening)	NS* (Class ID Ice Strengthening) NS (Class ID Ice Strengthening)
Polski Rejestr Statków	L1A	L1	L2	L3	L4
Registro Italiano Navale	ICE CLASS IA SUPER	ICE CLASS IA	ICE CLASS IB	ICE CLASS IC	ID

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Main Engine(s) Specific Fuel Oil Consumption (SFOC) (g/kWhr):

This figure should populate itself from the figure inputted in the Machinery section here, for the Main Engine:

Main Engine(s)

Was the engine built under license or by designer?

☐ Under licence ☐ Designer

Designer: ☐ MAN B&W ☐ Sulzer ☐ Wartsila
☐ Caterpillar ☐ Mitsubishi ☐ Cummins
☐ Rolls-Royce ☐ Yamaha ☐ Doosan
☐ Yanmar ☐ Daihatsu ☐ Hyundai Heavy Industries
☐ Other:

Model:

Cylinders: Power (MCR) (kW):

Speed (RPM): Stroke (mm):

Bore (mm): Specific Fuel Oil Consumption (SFOC) (g/kWhr):

NOx Tier: ☐ Tier 1 ☐ Tier 2 ☐ Tier 3

Auxiliary Engines Specific Fuel Oil Consumption (SFOC) (g/kWhr):

and here, for the Auxiliary Engines:

Diesel Generators / Auxiliary Engines

Number of Auxiliary Engines:

Designer: ☐ MAN ☐ Sulzer ☐ Wartsila
☐ Caterpillar ☐ Mitsubishi ☐ Cummins
☐ Rolls-Royce ☐ Yamaha ☐ Doosan
☐ Yanmar ☐ Daihatsu ☐ Hyundai Heavy Industries
☐ Other:

Model:

Cylinders: Power (MCR) (kW):

Speed (RPM): Stroke (mm):

Bore (mm): Specific Fuel Oil Consumption (SFOC) (g/kWhr):

NOx Tier: ☐ Tier 1 ☐ Tier 2 ☐ Tier 3

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These figures should be taken from the test report included in the NOx technical files for the respective engines and should be the figures corrected to ISO conditions. I.e., At 75% load for the Main Engine and at 50% load for the Auxiliary Engines. If this is not available, then the SFOC specified by the Manufacturer in the shop test report or the Engine Manual can be used.

Does the vessel have a shaft motor (Power Take-In)?

A shaft motor can be used to provide propulsion from the Electrical switchboard by de-coupling the shaft form the main engine and setting the system to act like a Propulsion Electric Motor. These systems may be reversible, I.e. the system may be a Shaft Generator that can be back-fed to be used as a propulsion motor. If this is the case, then the device should be taken as being a Shaft Generator or Power Take-off, and the relevant questions in the checklist should be answered.

It is important to gather the rated power consumption of the Shaft Motor by consulting the vessel or machinery particulars as well as gathering the rated average efficiency of the Auxiliary Engines. This information may be found on the electrical power table, machinery particulars, the Energy Efficiency Certificate supplement or by consulting with the Engine Room crew.

What is the expiry date of the International Air Pollution Prevention (IAPP) certificate?

This information can be found on the IAPP certificate itself and also on the Class Status Report.

What is the vessel's latest Carbon Intensity Indicator (CII) Score? (From the IMO DCS data):

The CII score will be a requirement from 2023, and can be calculated from the following simple formula:

$$CII = \frac{(HFO\ consumed \times 3.114) + (LFO\ consumed\ \times 3.151) + (DO\ consumed\ \times 3.206)}{Distance\ travelled\ in\ a\ year\ \times Deadweight}$$

The units of the score is grams of CO_2 per ton nautical mile (gCO_2/t.nm).

The information required to calculate the score must be supplied to the IMO Data Collection Service (DCS) every year since 2019. The data for the previous year must be submitted by the 31st March the following year. E.g., the total distance travelled, total fuel consumed and type of fuel consumed for the year 2021 must be provided to the IMO DCS by the 31st March 2022.

If the CII (sometimes known as the AER) is not calculated on board, please ensure to request the data that is provided to the IMO DCS. If this data is also not on board, please ask the Master to request it from the managers. The score can be easily calculated as long as the data is provided.

A number of vessels also calculate a similar score called the EEOI (Energy Efficiency Operational Index). This score is similar, but differs in that it does not divide by deadweight, but instead divides by the total amount of cargo carried in the year. This score is therefore a different number to the CII score, though has the same units. Please ensure that the score reported in the checklist is the CII score and NOT the EEOI (though this can be noted in the "Surveyor Comments" box at the end of the section, if it is provided).