

A Peek Under the Hood



**WHY INSPECTING YOUR SECONDHAND
SHIP IS A MUST BEFORE BUYING**

Every shipowner - past, present and future

will always need to choose between buying an existing ship or building a new vessel. The former allows one to get hold of a deployable asset immediately while the latter enables a ship built to one's specifications with the latest technology.



However, a secondhand ship comprises of many moving parts, machinery and equipment that have undergone some degree of wear and tear; a single loose nut or bolt could lead to a prolonged period of repair that incurs more expense on top of lost operating time and hence, revenue. This holds true especially for vessels that are more than 10 years old.

In theory, buying a pre-owned item comes with risks and the potential new owner making the secondhand purchase on “as-is” value could be met with defective parts inside the vessel. Pre-purchase inspections target these unknown issues and reduce information asymmetry in such transactions by giving potential buyers of older ships more details about the vessel's condition.

Such inspections enable owners to make better asset purchase decisions that protect their outlay along with peace of mind.

While this is non-exhaustive, this overview aims to provide an indication to owners of the key considerations that are important when buying a secondhand ship.

What is a vessel Pre-Purchase Inspection?



A pre-purchase inspection is an extensive, intense process that could take up to a few days and it is a thorough inspection of the vessel's structural and watertight integrity, installed machinery and equipment, operating condition, as well as an assessment of its condition.

A maritime expert who works on behalf of the buyer will check the ship in phases including afloat with all systems operating but not under load, and ashore with full access to the vessel's submerged areas. Through this series of inspections, the

inspector will check that the ship's engines, systems and components are working under actual sea conditions, verify the integrity of sea valves and hull penetration sealants, as well as determine the vessel's structural integrity respectively.

After the inspection is done, a comprehensive and detailed report is produced. The report should provide an accurate picture of the vessel's condition and highlights areas of concern that would require future capital expenditure.

The report assessment should be accompanied with corresponding pictures that supports its findings. A typical report structure will cover the following parts of the ship:

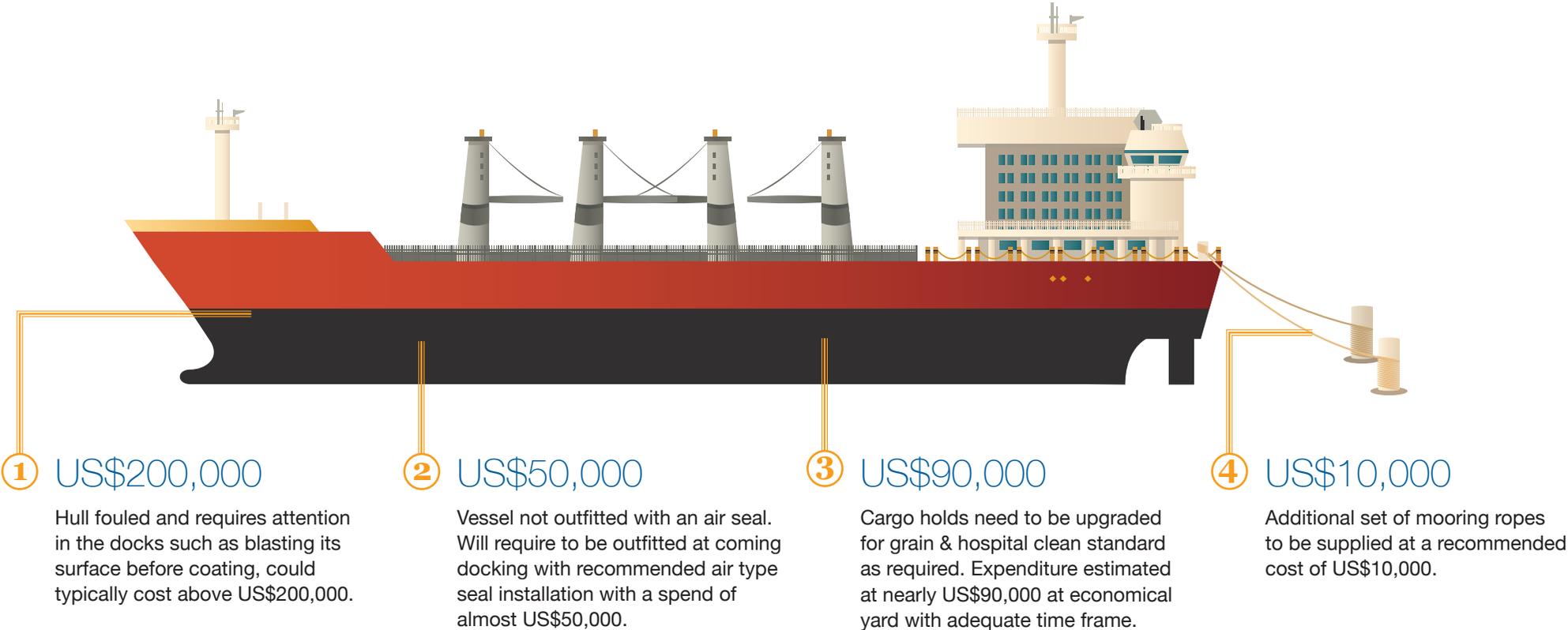
- Hull
- Decks
- Accommodation
- Cargo Tanks/Holds
- Ballast tanks
- Void Spaces
- Engine Room
- Navigation equipment
- Life saving and Fire Fighting equipment
- Control Systems

How can a Pre-Purchase Marine Survey REALLY help buyers?

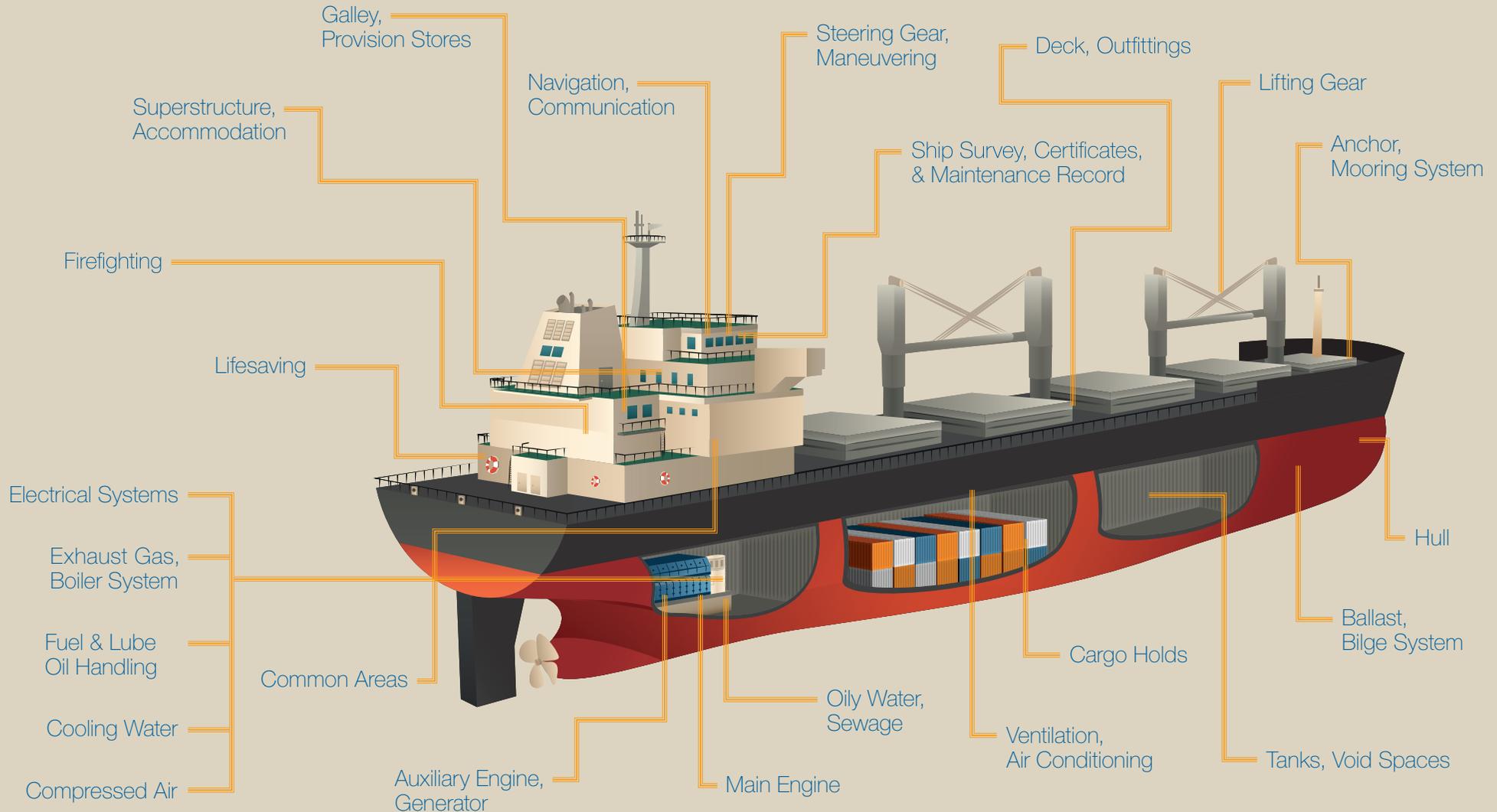


Buyers can utilize their pre-purchase inspection reports to decide whether or not to proceed with the deal. Before the transaction is executed, they can also use it to negotiate for specific repairs or price adjustments with sellers. The document gives a clear and realistic assessment of the ship, giving the new owner the essential facts to make informed, balanced decisions regarding the vessel and to evaluate its general condition, past history and overall operation before purchase. The report also highlights areas where the buyer may need to invest in the future, translating into capital expenditure that forms part of their business case investment analysis.

Using the example of a 50,000 metric ton bulk carrier that was delivered in 2012, a Pre-Purchase Inspection revealed the following areas that called for action by the new owner and the associated costs:



Ship location that are inspected



How extensive is a typical inspection?

From the complement of its crew to the last cargo carried, a pre-purchase survey aims to provide comprehensive, detailed information about any pre-owned ship that's about to change hands.

A typical inspection onboard is exhaustive and usually takes 1 to 2 days onboard. Areas of typical inspection onboard are as in Table 1.

The following section provides an overview of selected key aspects of a bulk carrier vessel that will be checked and examined by maritime experts during the course of an inspection.

Ship Survey, Certificates & Maintenance Plans Record

Overdue conditions, statutory and regulatory standing of the vessel, performance record in the industry and records of any previous damages (PSC/FSC/SIRE/Right Ship etc.).

Lifting Gear

Remote condition, leakage, poor maintenance.

Firefighting

Operational condition, wear and tear, pump and generator.

Lifesaving

Poorly marked plans, less-than-ideal equipment condition.

Auxiliary Engine, Generator

Leaks, gas leak stains, poor securing of insulator material.

Main Engine

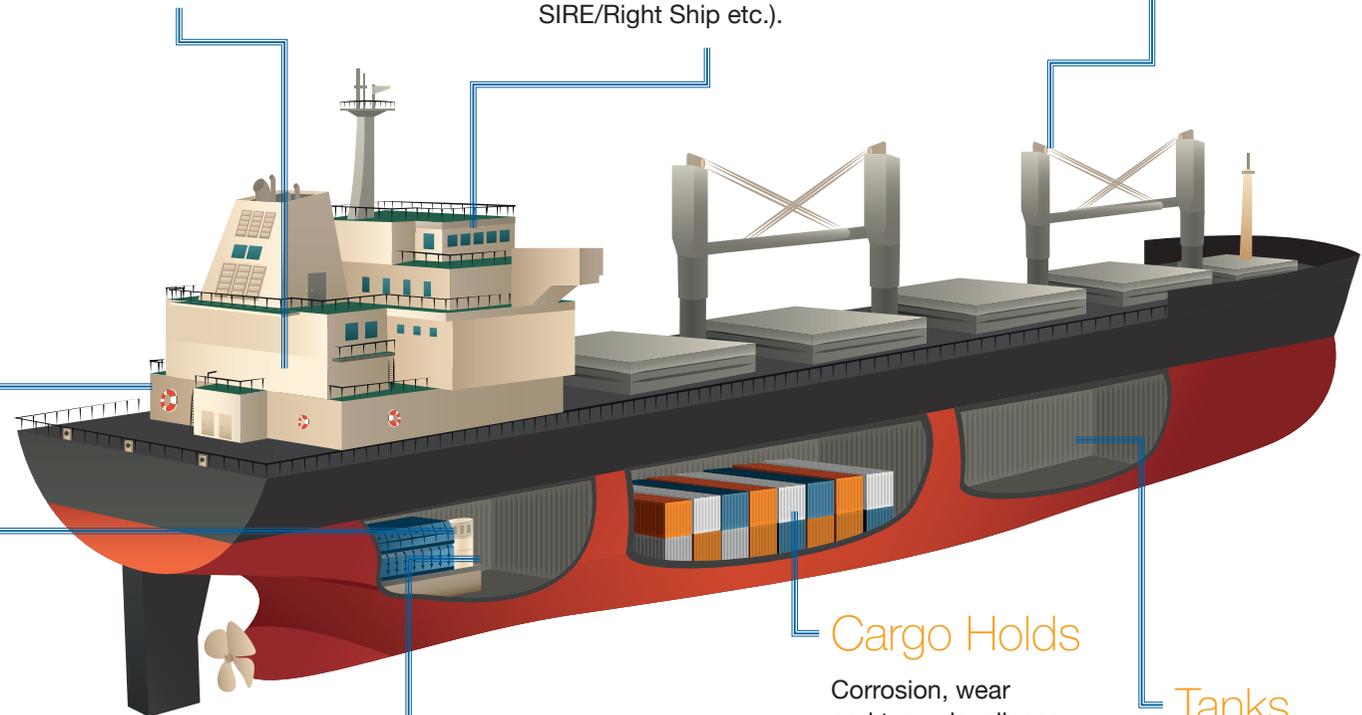
Spare part inventory, operational delay, cleanliness Poor aintenance, wear and tear.

Cargo Holds

Corrosion, wear and tear, cleanliness.

Tanks, Void Spaces

Rust, wear and tear, sedimentation.



Tank and Void Spaces

The general condition of the ship's tanks and void spaces are surveyed; in addition, the inspector will look out for anode protection and structural integrity

This helps provide an indication of the quality of maintenance. It also provides input to buyers for estimating the CAPEX (capital expenditure) required to upgrade or restore the condition.



Below are examples taken in forepeak tank



Paint structure at bow section intact and not much sedimentation.



Anode protection present. All anodes in excellent conditions.



Condition in Tank Valve is satisfactory. Pipes in good condition. Air vents had minor rust staining. Manhole covers in satisfactory condition with gasket in order.



Bell mouth areas clear. Striking plates in good condition.

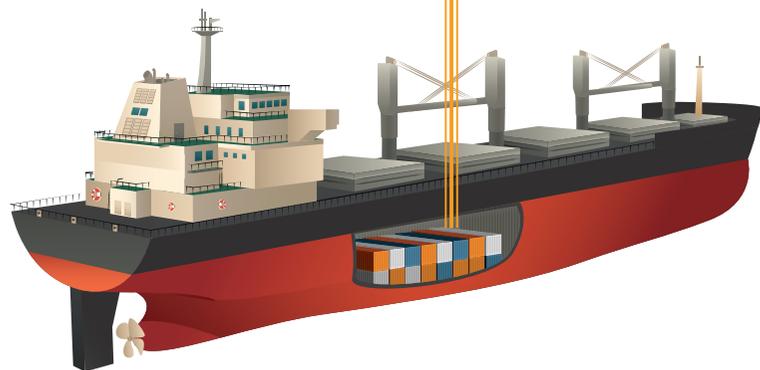
Cargo Holds and Cargoes

The ship's cargo holds will be examined for structural integrity and cleanliness, if they are weather tight, as well as seamless opening & closing

The operational condition of its bilge pumps, if applicable, will be checked along with its hatch opening systems, rubber packings and cleats.

It is very important to evaluate the cargo hold structural strength to ensure the condition is suitable to protect cargo within parameters.

This defines how the vessel can trade and what she is capable of carrying.



Below are examples taken in Cargo Holds of a bulk carrier



Cargo Hold No. 1

Cargo holds inspected, found in satisfactory condition. Tank top was clean but rust staining was observed. Holds reported to be weather tight. Opening and closing was observed to be satisfactory with no leakage observed. Holds required to be upgraded for grain and hospital clean cargoes.



Cargo Hold No. 3

Heavy weather ballast hold and pontoon is strengthened for helicopter landing. Vessel cargo holds can be operated with emergency pump which is available on board. Hatch opening systems are in good order. Rubber packings and cleats found in satisfactory condition.

Lifting Gear

This is a crucial area that determines a vessel's trade ability

Lifting gear must comply with classification society regulations since newbuild stage and are inspected on an annual basis. In addition to the visual inspection of the equipment, inspectors will access the general conditions including motor and wires by sighting the record book. Evaluation here will indicate the future investment required in the coming years.

Physical condition of the gears should be inspected. For a geared bulker, lifting gear is the critical equipment. A good working gear is critical to it's operation. Cranes and grabs on vessel are checked for operational condition, sighting, maintenance and leakage.

Condition of the installed wire rope should be inspected for signs of crushing, bending, fatigue and abrasion.

Remotes for lifting gears inspected to ensure in good working order. Spares for lifting gears such as hoisting and luffing wires, if available, are examined.



Below are examples of lifting gears and surrounding areas



Operational and Well maintained IHI Cranes – 30 MT SWL.



Inside Crane housing that is operational and wall maintained.



Grab working satisfactorily and last used date observed. All remotes working satisfactorily.



Gangway in good condition and well maintained.

Life Saving Systems

The number of life boats in accordance to flag requirements, type, and engine are inspected for operational purposes and SOLAS compliance

Check for lifeboats, type and quantity.

Lifesaving equipment such as rafts, buoys, immersion suits and buoys should be present and adequately marked.

This ensures the ship meets safety requirements and compliance.



Below are examples of lifesaving systems



2 life raft for 35 person located on side A deck.



Rescue boat for 6 person on starboard side reported to be operational.



A 30 person free fall lifeboat, enclosed type, diesel engine propelled. Reported to be trouble free.



Life raft for 6 persons located on forward deck.

Fire Fighting Systems

Vessel areas are checked if they are each equipped with dedicated firefighting systems and for SOLAS compliance

The emergency fire pump is inspected for it's working condition.

Emergency power plant, if available, is examined for it's operability and power output.

This ensures the ship meets safety and compliance assurance.



Below are examples of fire fighting systems



High Expansion Foam Fixed Type for Engine room, Hyper mist system for Machinery spaces and spray system for paint store.



Emergency fire pump located in aft near steering gear room found to be in satisfactory condition. Does not have a non-return valve on the suction line.

Main Propulsion System

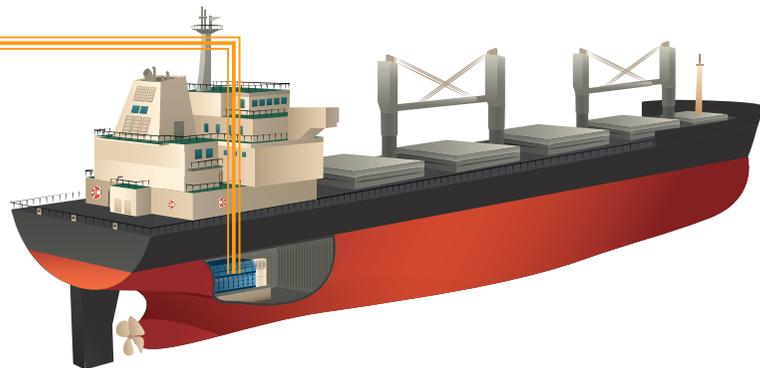
The ship's main engine is examined for leakages, assessment of cylinder and turbocharger overhaul records and observed for technical off-hire and operational delay

Last overhaul and due dates are good indication of maintenance. Any signs of leakages and stains are indicative poor maintenance.

The main engine's cylinder cover/jacket is checked for abnormality as well as cleanliness.

Performance reports should indicate that all performance parameters are within normal conditions.

Main engine's spare parts are inspected to ensure that minimum quantities required are maintained and are in satisfactory condition.



Below are examples of a Main engine: Mitsui-MAN B & W 6S50MC-C (Mark 7)

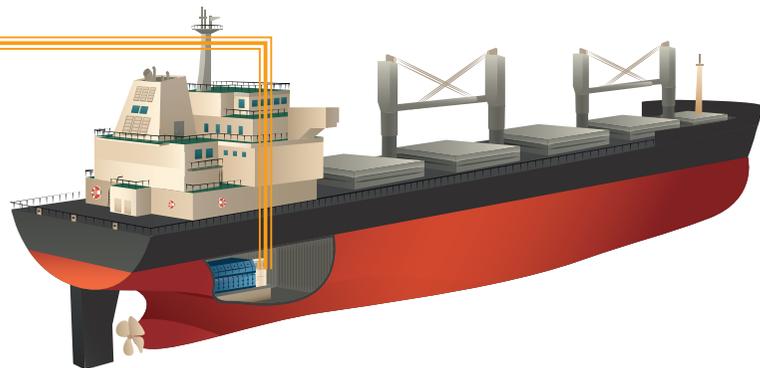


No abnormality observed for cylinder cover/jacket and frame. In clean condition. Control system, alarm monitoring device found in satisfactory condition.

Auxiliary Engines and Generators

Vessel's auxiliary engines and generators are inspected for total running hours, maintenance status, number of running hours since last overhaul of pistons, turbochargers, governors, as well as list of major spare parts available on board

In this area, inspector will try to access the generator's condition including the load that they have been carrying recently. Updated maintenance dates are checked and also if overhauling is needed on turbochargers.



MAKER: YANMAR
Type: 6EY18AL
550kW x 900RPM x 3SET x Bore
180mm x Stroke 280mm
ALTERNATOR AC 450V x 60HZ x
480KW x 3PHASE



Auxiliary engine: Yanmar Type 6EY18AL
All three engines well maintained and in good condition.

3 Sets generator condition satisfaction with Yanmar NZ61plus governor.

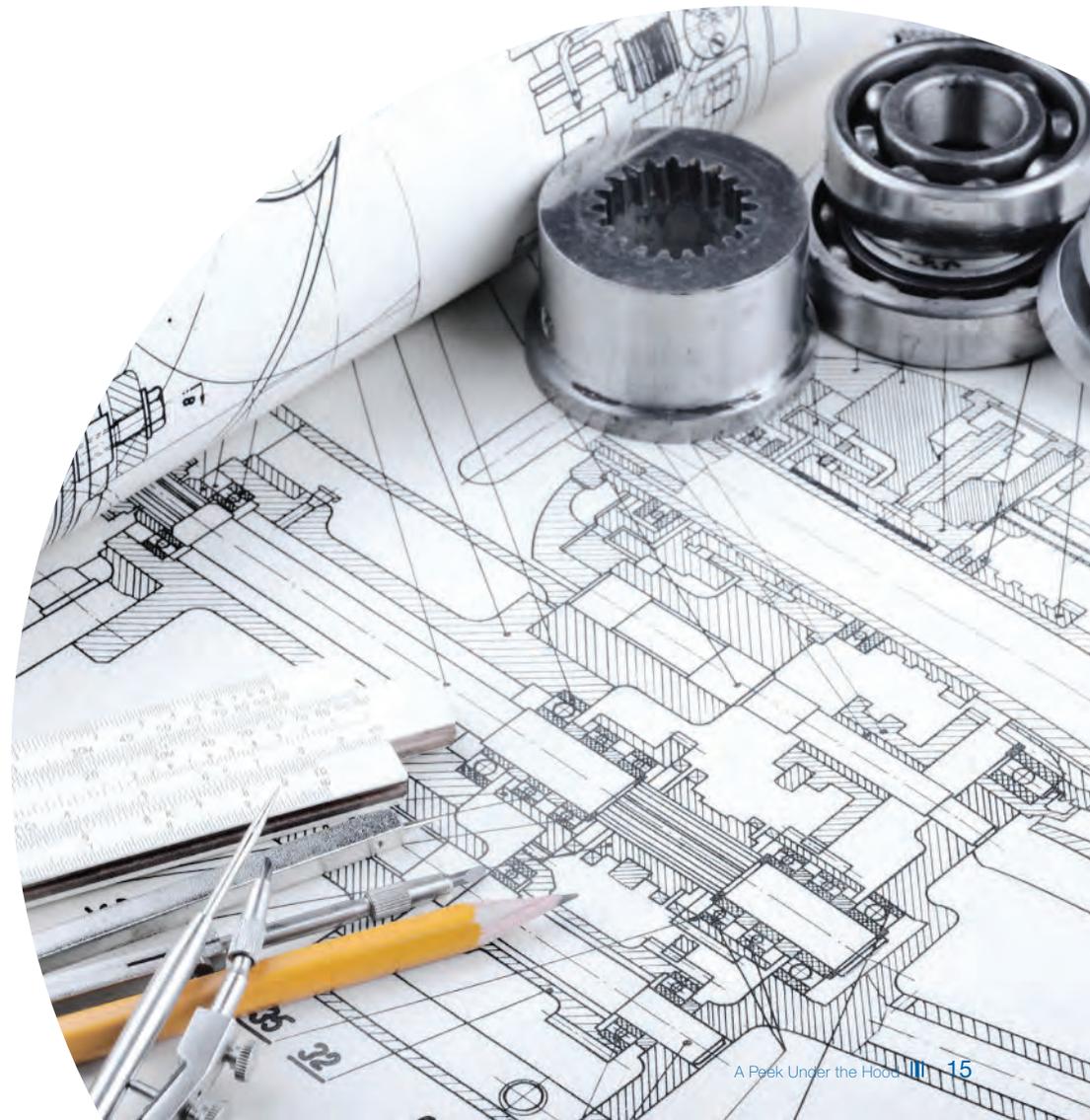


Survey, Certificates & Maintenance Record Plans

The ship's Survey, Certificates and Plans are inspected for anything that's overdue or outstanding

This indicates vessel compliance and what survey cycles are due, which will translate into cost basis outstanding items.

Historical data are also accessed to gauge if there is any previous issues encountered.



In Conclusion...



The pre-purchase inspection of an existing vessel is an exacting, thorough and rigorous process that every owner should be aware of if they are keen to buy their assets. It is also imperative that the inspection should be done in consideration to comply with the upcoming regulation that will be enforced such as Ballast Water Management System and IMO 2020 Sulfur Cap.

Buying and selling a ship in the secondhand market is a two-way

street and pre-purchase surveys give the trade credibility and objectivity while ensuring the interests of all parties are protected. Not every potential ship owner can afford to buy a new ship or wait for a newbuilding to be completed; hence, pre-purchase checks can help the secondhand trade thrive and stay relevant. Nobody likes to buy a defective product and the inspection goes a long way to eliminate any possible information asymmetry, as well as any potential sourness in such transactions.

About the team

Ajit Kurup

General Manager – Ship Inspection Services

Ajit Kurup leads the ship inspection division at Wilhelmsen Ship Management and plays a large role in ensuring quality and accuracy of the ship inspections. Ajit has nearly 4 decades of experience in this field ranging from ship management to ship inspections. Prior to joining Wilhelmsen, Ajit was the Managing Director of SeaTec Inspection, under his leadership – they have managed to achieve 1000 ship inspections within 2 years. He was also one of the pioneers that developed a web based portal which increases the efficiency of inspection reports to be ready within a short time frame for financial investors and ship brokers to access the information they need.



Siwe Ping, Hee

Operations Manager – Ship Inspection Services

With more than 12 years of operational and technical experiences in her hands, Siwe Ping is Wilhelmsen Ship Management's resident expert in ship inspections operations. She maintains a network of trained and qualified ship inspectors and is the core reason for the seamless coordination and operations of this business. Prior to joining Wilhelmsen, Siwe Ping was with V.Ships holding the position as operations controller.

Siwe Ping holds a Bsc in Sustainable Maritime Shipping for University of Plymouth.



Ship Inspection Service division - Ship Management

Ship inspection services provide timely and accurate assessment of your asset condition. We provide high quality ship inspection assessments to ship owners, managers, banks, financial institutions, fund houses, and investors.

Ship inspection services is a division of Wilhelmsen Ship Management, a Wilhelmsen group company. Wilhelmsen is a global maritime industry group, and a leader within the industry.

With the world's largest maritime network on call 24/7, we can deliver products and services on the ground practically anywhere you have a ship or a maritime related industry. We make the maritime industry spin.

Quality service delivery is the hallmark of success in our business. We are committed to deliver bespoke inspection service with purpose built reports, delivered through a web access portal within a short turnaround time.

Contact us for an accurate and professional assessment of your potential asset:

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