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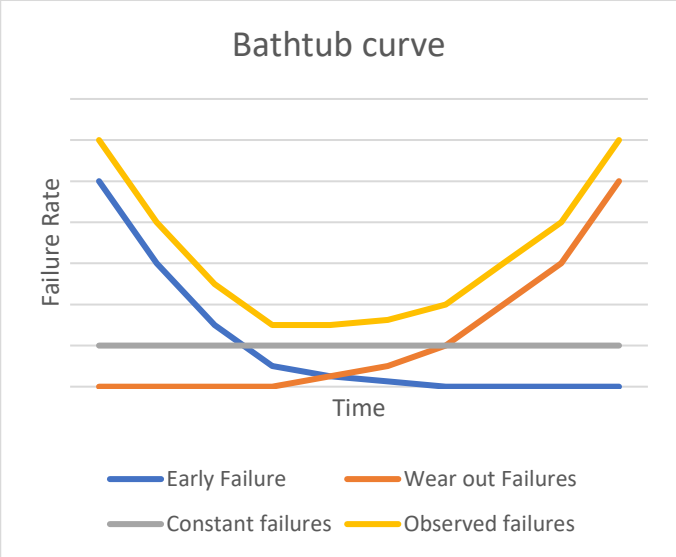
BUYING NEW SHIP

Purchasing a new or second-hand ship is always a daunting task. From selecting the right vessel and ensuring proper documentation to finally stepping aboard, the process is long and demanding—especially for first-time buyers. Given the complexity of this undertaking, it is easy to overlook critical details. This document focuses on the final stage: boarding the vessel. While it may seem like the conclusion of the journey, it marks the beginning of the true challenge—operating the ship effectively and safely.

Operating a vessel might seem straightforward, but initial unfamiliarity with the ship can lead to unforeseen complications. It is similar to purchasing a car—mechanical issues are most likely to arise soon after acquisition. This phenomenon can be explained by the bathtub curve, a reliability engineering concept that illustrates how failure rates change over time.



The bathtub curve describes the likelihood of failures at different stages of a product's lifecycle. In the initial phase, failures are more frequent due to early defects, misconfigurations, or user errors. After this phase, failure rates decrease and remain low during the vessel's operational life. As the vessel ages, the failure rate begins to rise again due to wear and tear. The graph depicting this pattern resembles the shape of a bathtub, hence the name.

Early failure rates, often referred to as "infant mortality" failures, are common in newly acquired vessels. In the case of new ships, these failures are typically due to crew unfamiliarity with the vessel's systems. Mistakes such as opening the wrong valve, using incorrect settings, or failing to understand the ship's unique characteristics can lead to serious issues. Purchasing a used vessel adds further complications, as ships are usually bought "as is," meaning that not all systems can be fully checked or tested prior to acquisition. To make matters worse, previous owners often remove crucial documentation, leaving new owners with little operational history. It is safest to assume that no maintenance has been carried out and to perform all necessary inspections and servicing as if the ship were completely unmaintained.

A ship can be divided into three primary operational areas: the engine room, the bridge, and the deck. Each area has specific risks and essential checks that must be performed to ensure safety and reliability.

The engine room is a complex and vital part of the vessel, responsible for propulsion and power generation. Two of the greatest short-term risks in this area are flooding and fire. Preventing flooding starts with identifying all potential points of water ingress. Since external sources are the primary concern, a thorough inspection of pipes, valves, and any openings is essential. Before

operating any system, it is necessary to understand what each pipe and valve controls. Any unidentified or corroded piping must be inspected carefully, as a mistake could result in water entering the engine room.

Fire is another ever-present danger due to the use of flammable materials. Despite modern safety regulations under SOLAS (Safety of Life at Sea), risks remain high if fuel-related systems are not properly maintained. All pipes, tanks, and fuel-handling machinery, including separators and centrifuges, should be checked for leaks or damage. When operating the engine room for the first time, only essential machinery should be started, and crew members should ensure they fully understand each machine's operation before use.

Among the most failure-prone components in the engine is the cylinder assembly. Special attention should be given to the valvetrain, as there have been numerous cases where valvetrain failures led to valve collisions with pistons, destroying the engine. This risk is particularly significant for interference engines, making early inspections crucial.

The bridge serves as the command centre, housing a complex network of instruments used for navigation and vessel control. Given the variety of equipment, it is critical for the crew to familiarize themselves with all essential systems as soon as possible. However, time constraints often mean that full training before departure is not feasible. In such cases, officers should focus on the most important instruments required for safe navigation and daily operations.

One of the most critical systems on the bridge is the Electronic Chart Display and Information System (ECDIS), which greatly enhances navigation safety. Unfortunately, not all vessels are equipped with ECDIS, but when it is available, the Master and Chief Officer must ensure they understand its operation immediately. The most important aspect to learn is the configuration of safety alarms, which significantly reduce the risk of groundings and collisions. In one notable case, both the Master and Chief Officer were unfamiliar with the ECDIS system and had unknowingly set all alarms to silent mode. Without warnings, they failed to realize they were approaching shallow waters and ran aground shortly after. This incident highlights the importance of fully understanding ECDIS safety features from the start.

Another essential yet sometimes misleading instrument is the echo sounder. Although simple in design, improper settings can create serious risks. One crucial distinction to understand is the difference between depth below keel and depth below waterline. Depth below keel is straightforward, but depth below waterline includes the vessel's draft and often requires manual input. If this input is incorrect or omitted, the system may display misleading depth readings, giving the crew a false sense of security. For example, the system might indicate ten meters of water below when, in reality, there is only one meter beneath the keel. To avoid such errors, the echo sounder should always be set to display depth below keel as early as possible.

Radar operation presents another area where misinterpretation can lead to serious consequences. Radar systems typically offer two motion modes: relative motion, which shows the movement of objects relative to the vessel, and true motion, which represents the actual movement of objects over the ground. Additionally, the radar display can be oriented in two ways: North Up, where north remains at the top of the screen, and Heading Up, which aligns the display with the ship's forward direction. Confusing these settings can lead to navigational errors, with potentially deadly results, as history has shown.

Cargo operations are essential for a vessel's profitability, but the biggest structural risk to any ship is water ingress. The most obvious entry points are hatches, which must be thoroughly inspected to ensure that their rubber seals are watertight. However, another less immediately apparent risk comes from bilges. Under normal conditions, bilges are used to pump out accumulated water, often from hold washing, and discharge it overboard. If these systems are poorly maintained or improperly operated, they can allow water to enter instead of being pumped out. Every bilge should be checked to confirm it is watertight before departure.
Other openings to the outside, such as ventilation systems, also pose a risk. Many vents can be sealed to make them weathertight, but the crew must be trained on how to operate these closures properly. During early voyages, all external openings should be identified, tested for weathertightness, and sealed if necessary.

Given the heightened risk of operational failures during a vessel's first voyages, carrying water-sensitive cargoes should be avoided. This is especially important for cargoes that are corrosive, toxic, or reactive with water, as they could create dangerous conditions if exposed to moisture.

The early phase of operating a new or newly acquired vessel should be treated as a test period. Since maintenance records may be unreliable or incomplete, it is best to assume that no servicing has been done and conduct thorough inspections accordingly. Crew training should be prioritized, with particular emphasis on learning the ship's unique characteristics. Navigational safety systems, including alarms and sensor settings, should be verified to ensure they function correctly. Finally, all precautions must be taken to maintain the vessel's watertight integrity, as undetected leaks or improperly sealed openings could lead to serious structural damage.