Input paper: [[1]](#footnote-1) VTS58-7.2.7

Input paper for the following Committee(s): check as appropriate Purpose of paper:

**□** ARM **□** ENG **□** PAP  Input

**□** ENAV VTS Information

Agenda item [[2]](#footnote-2) 7.2.7

Technical Domain / Task Number 2 N/A

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Report of near misses and accidents related to

machinery failure of vessels in VTS area

# SUMMARY

In response to the document VTS57-7.2.4.1 *Essential Practices for Data and Management in Developing Automated Near-Miss Incident Identification* submitted by Singapore at the VTS Committee 57th meeting and referencing the definition of "near miss" in the *MSC-MEPC.7/Circ.7 ANNEX- Guidance on Near-Miss Reporting*, the China Maritime Safety Administration provides relevant information on machinery failures of vessels occurring in VTS areas over the past three years, aiming to draw the VTS Committee's attention to machinery failures of vessels in VTS waters.

## **2 Relevant documents**

(1) IALA WP VTS57-7.2.4.1 *Essential Practices for Data and Management in Developing Automated Near-Miss Incident Identification*

(2) MSC-MEPC.7/Circ.7 Guidance on Near-Miss Reporting

(3) IALA G1118-Marine Casualty/ Incident Reporting and Recording, Including Near-miss Situation as it Relates to a VTS

# 3 Background

Reviewing and analysis of historical data from China maritime authorities and the official website of the Marine Accident Investigation Branch(MAIB) in UK indicates an increasing prevalence of machinery failures of ships within port waters. Due to dense traffic in port areas, improper handling by crew members can easily lead to near misses or even accidents. The direct impact is reduced navigation efficiency in VTS waters, posing threats to vessel safety, Aids to navigation, and the marine environment. The indirect impact is the heightened demand for VTS providers' emergency response capabilities, increasing the workload of VTS operators in port traffic management.

# 4 Data Statistics

●According to the maritime investigation report data received by MAIB (refer to Fig.1), there were 190 equipment loss incidents and 33 incidents of ship loss during the arrival, departure, and transition of merchant ships with a gross tonnage of over 100 tons in 2022. The annual data were 334 cases (equipment loss) and 48 cases (ship out of control) in 2023. And there were 373 cases (equipment loss) and 43 cases of ship out of control in 2024.

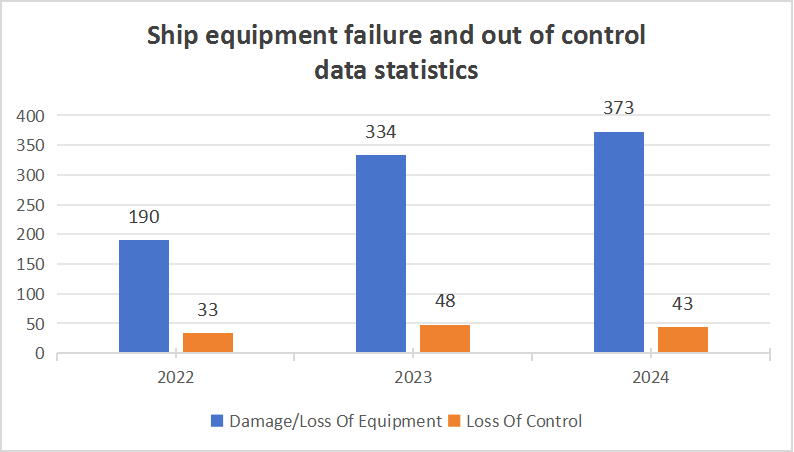


Fig.1 Ship equipment failure and loss of control[[3]](#footnote-3)

● As the largest comprehensive port in northern China in terms of cargo throughput, Tianjin Port mainly berths container ships and bulk carriers. In 2022, there were 73,000 ships entering and leaving Tianjin Port, and 29 ship failures occurred in the port area, with a failure rate of 0.39‰. Among that, there were 27 main engine failures and 3 rudder failures, which caused 8 near misses(The ship involved in the incident was in the traffic flow and dispatched assistance forces, the same below). In 2023, there are 85,000 ships entering and leaving the port, and 40 ship failures occurred in the port area, with a failure rate of 0.47‰. Among that, there were 29 main engine failures and 3 rudder failures, resulting in 10 near misses and 1 accident (collision). In 2024, there were 81,000 ships entering and leaving the port , and 43 ship failures occurred in the port area, with a failure rate of 0.53‰. Among that, there were 36 main engine failures and 4 rudder failures, resulting in 13 near misses.

● As one of the busiest ports in the world, Shanghai Port ranks among the world's top in terms of container and cargo throughput, and the total number of ship machinery failures occurring in dense traffic waters is also large. In 2022, there were 0.96 million ships entering and exiting the Shanghai Port area annually, with 253 ship failures and a failure rate of 0.26‰. The average age of the faulty ships was 12.77, including 203 main engine failures and 33 rudder failures, resulting in 37 near misses and 1 accident (grounding). In 2023, there were 1.12 million ships entering and leaving the Shanghai Port area, with 190 ship failures and a failure rate of 0.17‰. The average age of the faulty ships was 13.0, including 138 main engine failures and 21 steering gear failures, resulting in 48 near misses. In 2024 , there were 1.07 million ships entering and exiting the Shanghai Port area, with 164 ship failures and a failure rate of 0.15‰. The average age of the faulty ships was 13.43, including 126 main engine failures and 18 rudder failures, resulting in 30 near misses and 2 accidents (collisions).

● As a hub in China and a large global port, Ningbo-Zhoushan Port's cargo throughput exceeded 1.37 billion tons in 2024, and incidents affecting traffic safety due to ship machinery failures in the port waters are also frequent. In 2022, there were 0.58 million ships entering and leaving the Ningbo-Zhoushan Port area, with 127 ship failures and a failure rate of 0.22‰. Among that, there were 102 main engine failures and 13 steering gear failures, resulting in 29 near misses. In 2023, there were 0.75 million ships entering and exiting the Ningbo-Zhoushan Port area each year, with 128 ship failures and a failure rate of 0.17‰. Among that, there were 74 main engine failures and 17 steering gear failures, resulting in 31 near misses. In 2024, there were 0.65 million ships entering and exiting the Ningbo-Zhoushan Port area, with 153 ship failures and a failure rate of 0.24‰. Among that, there were 118 main engine failures and 14 steering gear failures, resulting in 35 near misses.

● As one hub port in the south of China, the cargo throughput of Guangzhou Port reached 680 million tons in 2024, and the incidents that affect traffic safety in port waters due to ship machinery failures are also frequent. In 2022, there were 1.16million ships entering and leaving Guangzhou Port, with 28 ship failures and a failure rate of 0.02‰, including 24 main engine failures and 2 steering gear failures, which led to 18 near misses and 1 accident. In 2023, there were 1.23million ships entering and leaving Guangzhou Port Area, with 37 ship failures occurred and a failure rate of 0.03‰, including 34 main engine failures and 2 steering gear failures, which led to 30 near misses and 3 accidents. In 2024, there were 1.52million ships entering and leaving Guangzhou Port, and 91 ship failures occurred, with a failure rate of 0.06‰, including 78 main engine failures and 10 steering gear failures, which led to 56 near misses and 9 accidents.

**5 Outline of Typical near misses and accidents**

**5.1 near misses**

Case 1: On June 11, 2024, at 2008 LT, Marshall Islands flag bulk carrier "**VALIANT**" departed from Tianjin Port and sailed towards buoy Number 44 in the channel. The steering gear jammed, causing loss of control and drift towards a buoy. Emergency anchoring was executed to arrest the drift. At 2012 LT, a tugboat was dispatched to assist in controlling the vessel's position. At 2020 LT, the vessel's position was under control, and temporary traffic control was implemented in the channel. At 2042 LT, the anchor was weighed and navigation resumed under tug escort outbound, with normal traffic flow restored.

Case 2: On September 1st, 2024 and at 1500 LT, Panamanian flag bulk carrier "**ASIAN PEARLS**" experienced a complete blackout while entering the port from the south side of Buoy No.83 on the Baobei channel in Shanghai Port, causing the rudder to jam and leaving the vessel out of control, posing a threat to the safety of ships anchored in the anchorage to the south. Tugboats were dispatched for emergency response, and the vessel berthed at the dock at 1715 LT.

**5.2 accidents**

Case 3: On February 25th, 2023, "**WAN HAI235**" with a Taiwan, China registry, while departing from the port of Tianjin, experienced a rudder failure for 3 minutes. After the rudder was restored, the ship's maneuverability was compromised. An emergency was declared, and the vessel dropped both anchors to brake. It subsequently collided with the berthed ship "**SHEN HUA512**".

Case 4: On May 24th, 2023, Chinese flag ship "**RENJIAN JINGTANG**" had a main engine failure when leaving Tianjin Port near Dagu Lighthouse. After becoming uncontrollable, the ship conducted an emergency anchoring near Dagu Lighthouse to stabilize its position. The anchor was deliberately abandoned during retrieval attempts.

Case 5: On May 12th, 2024, Panamanian flag ship "**AVIGATOR**" entered the port and reported a main engine failure near the No.9 Buoy in the north channel of Shanghai Port. When maneuvering out of the channel, the ship lost steering effectiveness due to slow speed. The attempt to anchor on the northeast side of the buoy failed. During anchor retrieval, the anchor chain fouled with the buoy, causing the buoy to shift.

Case 6: On June 10th, 2024,at 1750 LT, liquefied gas carrier flying Panamanian flag "**CALYPSO 7**" suffered a complete blackout when leaving one Shipyard located at Guangzhou Port . After the ship lost control, the stern touched the No.11 Buoy, causing the Buoy to shift to the south by 2700 meters. Finally, the ship executed emergency anchoring in the channel. At 2110 LT, three tugboats assisted collectively to relocate the ship outside the channel and escorted her to the anchorage.

A key similarity across the aforementioned near miss incidents and casualties lies in their causation by the ship's machinery failure that impaired the normal manoeuvring capability of the ship, coupled with the limited water area, leaving the crew or pilot with critically limited reaction time, ultimately causing safety threat or damage to nearby ships or Aids to navigation.

**6 Safety analysis**

The statistics show that the age of ships with machinery failure is distributed around 13-14 years. According to data from the United Nations Conference on Trade and Development (UNCTAD) in 2023, the average age of the global fleet has reached 18 years, with the average age of LNG ships exceeding 15 years, except for LNG ships which have an average age of 12 years[[4]](#footnote-4). According to the failure information reported by the ship and the investigation by the maritime authorities, the underlying causes of machinery failure of the ship in the port area include, but are not limited to:

● In response to the competitive pressures in the shipping market, shipowners or ship companies increasingly prioritize cost-cutting in maintenance, leading to reduced willingness to perform necessary upkeep or update aging equipment;

● Crew selection by ship companies or agents tends to focus excessively on minimizing crew costs, overlooking the adverse effects of high crew turnover, such as a decrease in ship maintenance awareness and lack of proficiency in operating key equipment;

● Due to the pressure during the voyage, the main machinery is not warmed up, checked and prepared enough before the ship leaves or enters the port.

In order to reduce the risk of ship machinery failures, as the competent authority of Port State government, China Maritime Administration has taken countermeasures based on the above reasons:

●Where multiple ship machinery failures occur within a fleet, the shipowner or ship company is required to review and improve the safety management system (SMS), focusing on ship maintenance, equipment updates, and crew management, to the satisfaction of the competent authority.

●Ships flying the flag of China are required to conduct pre-departure safety self-inspection using the "Safety self-inspection list of China-registered ships before sailing", in order to reduce ship failures caused by human negligence. Additionally, ship agents are directed to carry out publicity to foreign ships intending to enter China, reminding the maintenance of machinery equipment and potential hazard check.

# 7 Action requested of the Committee

The committee is requested to:

1 be aware of the trend of dangers and accidents in VTS waters due to ship machinery failure, and encourage States to share relevant reports or data to form a comprehensive report;

2 invite the Secretariat to note the information in this document, and prepare a comprehensive report to submit to IMO if necessary.

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-1)
2. Leave open if uncertain [↑](#footnote-ref-2)
3. 3 According to the statistics from the MAIB official website.https://maps.dft.gov.uk/maib-data-portal/web-pages/pbi\_dashboard.html [↑](#footnote-ref-3)
4. Refer to https://unctadstat.unctad.org/datacentre/dataviewer/US.PortCalls [↑](#footnote-ref-4)