

Final Report

SINKING OF TWO HARBOUR CRAFT OSHIO AND YAKUSHI MARU NO 3 RESULTING IN TWO FATALITIES ON 4 SEPTEMBER 2024

TIB/MAI/CAS.179

Transport Safety Investigation Bureau of Singapore
Ministry of Transport
Singapore

4 April 2025

The Transport Safety Investigation Bureau of Singapore

The Transport Safety Investigation Bureau of Singapore (TSIB) is the air, marine and rail accidents and incidents investigation authority in Singapore. Its mission is to promote transport safety through the conduct of independent investigations into air, marine and rail accidents and incidents.

TSIB conducts marine safety investigations in accordance with the Singapore Transport Safety Investigations Act 2018, Transport Safety Investigations (Marine Occurrences) Regulations 2023 and the Casualty Investigation Code under SOLAS Regulation XI-1/6 adopted by the International Maritime Organization (IMO) Resolution MSC 255(84).

The sole objective of TSIB's marine safety investigations is the prevention of marine accidents and incidents. The safety investigations do not seek to apportion blame or liability. Accordingly, TSIB reports should not be used to assign blame or determine liability.

Table of Contents

ABBREVIATIONS	4
SYNOPSIS	5
1 Factual information	7
1.1 Sequence of events	7
1.2 The harbour craft	8
1.3 Crew’s qualifications, roster and roles.	11
1.4 The side-tow arrangement	11
1.5 Towing operation guidance	13
1.6 Additional information	14
1.7 Incidental observations	17
1.8 Cause of death	18
1.9 Environmental condition	18
2 Analysis	19
2.1 Sinking of the craft	19
2.2 Emergency response and preparedness	20
2.3 Risk assessment for towage operation	21
2.4 The Operator’s SOM	22
3 Conclusions	23
4 Safety Actions	24
5 Safety Recommendations	25

ABBREVIATIONS

AIS	Automatic Identification System
AEPC	Eastern Petroleum 'C' Anchorage
COSWP	Code of Safe Working Practices for Merchant Seafarers
ED	Engine Driver
GPS	Global Positioning System
HMD	Head of Marine Department
MOC	Marine Operations Coordinator
MPA	Maritime and Port Authority of Singapore
PPC	Pasir Panjang Control
POCC	Port Operations Control Centre
RA	Risk Assessment
SOM	Standard Operations Manual
VHF	Very High Frequency
YM3	Yakushi Maru No. 3

SYNOPSIS

On 4 September 2024, the workboat, “Yakushi Maru No. 3” (YM3) with an engine issue, was side towed by the tugboat, Oshio from Pandan to Tekong within the Port of Singapore. In the mid-passage, the stern of YM3 took in water and sank. Oshio, which was secured to YM3 by two mooring ropes, sank with YM3.

The sinking occurrence resulted in the loss of lives of the Master and Engine Driver (ED) on board Oshio.

The Transport Safety Investigation Bureau of Singapore classified the occurrence as a very serious marine casualty.

The investigation revealed that the side-tow operation was conducted under windy and rough sea with high swells environmental conditions.

The investigation also revealed that YM3, having a low freeboard, was likely taking in water into the machinery compartment at its stern through openings. A distress alert was not activated at the time of sinking.

The investigation further revealed that both the Master and ED did not wear their personal floatation devices at the time of the occurrence. Emergency drills such as man overboard and sinking of craft were not conducted in the past.

VIEW OF TWO HARBOUR CRAFT



Oshio (left) and Yakushi Maru No 3 (right) (Source: the Operator)

DETAILS OF TWO HARBOUR CRAFT

Name	Oshio	Yakushi Maru No 3
Licence number	ST 1365G	SR 3444D
Ship type	Tugboat	Workboat
Year built	1997	1988
Owner and Operator ¹	Oung Marine Services (S) Pte Ltd	Oung Construction (S) Pte Ltd
Hull	Steel	Steel
Gross tonnage	34.0	12.7
Length overall	12.9m	8.5m
Breadth	5.2m	3.8m
Depth	1.8m	1.4m
Engine power	Yanmar, Twin inboard diesel engines, 671 kW	Yanmar, single inboard diesel engine, 206 kW
Speed	Twin propellers, at maximum of about 10.0 knots	Single propeller, at maximum of about 10.0 knots

¹ Both harbour craft were non-SOLAS type of vessels, the management of the safety and operation was performed by the Operator (herewith named as “the Operator” in this investigation report) The Operator was also the owner.

1 **FACTUAL INFORMATION**

All times used in this report are Singapore Local Time unless otherwise stated. Singapore Local Time is eight hours (H) ahead of Coordinated Universal Time (UTC+8H).

1.1 **Sequence of events**

- 1.1.1 On the evening of 3 September 2024, through a WhatsApp chat group, the Operator of tugboat “Oshio” assigned its master (hereinafter referred to as the Master) to tow workboat “Yakushi Maru No. 3” (YM3) from Pandan to Tekong, within the Port of Singapore on the next day. The Master acknowledged the job order by replying to the same group chat.
- 1.1.2 On 4 September 2024, at about 0930H, Oshio, manned by the Master and an Engine Driver (ED), arrived at Pandan and was alongside YM3. With the assistance of another master², Oshio and YM3 were secured by mooring ropes for side-tow.
- 1.1.3 At about 0954H, the Master took a photo and sent it to the chat group informing the Operator that Oshio had departed Pandan for Tekong.
- 1.1.4 At about 1015H, the Master made a first report to the PPC³ via VHF channel 18, informing PPC that Oshio was departing Pandan river for Tekong which was acknowledged by the PPC.
- 1.1.5 At about 1039H, the Master posted a video on social media⁴ showing windy and high swell sea conditions which Oshio was encountering at the time. The speed of Oshio was tracked by the AIS to be at about 4.7 knots.
- 1.1.6 At about 1048H, the Master made his second report to the PPC informing that Oshio was passing east of Cyrene and changing VHF channel to 68 (to report to next sector control).
- 1.1.7 Between 1054H and 1058H, based on the AIS replay information, the speed

² Working for the same Operator as a crane barge master, was on standby without job assignment at Pandan mooring base at the time.

³ A sector under the Port Operation Control Centre (POCC) of the Maritime and Port Authority of Singapore (MPA).

⁴ A WhatsApp “Updates” on the Master’s personal account showed video footage, which was discovered after the occurrence. The video footage was not sent to the chat group.

of Oshio was between zero (0) and 0.3 knots. At about 1059H, its speed increased to 5.4 knots and continued moving eastwards.

- 1.1.8 At about 1349H, an MOC⁵ from the Operator received a WhatsApp call from the Master, shouting that the stern of YM3 was taking in water and that Oshio was starting to sink. The call lasted about 28 seconds and got disconnected. The last AIS position⁶ of Oshio was at the AEPC.
- 1.1.9 At about 1351H, the MOC reported the incident to his supervisor, the HMD. The MOC tried calling the Master and ED, but the calls were not answered. The last speed was tracked as 3.9 knots at about 1351H.
- 1.1.10 At about 1413H, the MOC reported the incident to the PPC and was directed to the Marine Safety Control Centre of the MPA for assistance.
- 1.1.11 At about 1432H, an MPA patrol craft arrived at the reported incident site but was unable to find Oshio. The search operation for the two missing crew was initiated by the MPA and assisted by the Singapore Police Coast Guard.
- 1.1.12 At about 1521H, an unconscious person was found at the beach area near to the accident site and was identified to be the Master.
- 1.1.13 At about 0751H on 7 September 2024, the ED's body was found on the shoreline of East Coast Park. The sunken Oshio and YM3 were salvaged out of water on the same day.

1.2 The harbour craft

1.2.1 Tugboat Oshio

- 1.2.1.1 Oshio was licenced as a tugboat on 9 July 2024 by the MPA to operate within the Singapore port limits in accordance with the provisions of MPA's harbour craft regulations⁷. Minimum manning requirements for a tugboat comprised one steersman and one Class 2 engine driver.

⁵ MOC passed down job orders and instructions given by the Operator to masters or crew of harbour craft. The deployment of all harbour craft managed by the Operator was also overseen by MOC.

⁶ Latitude 01 17-50N and Longitude 103 59-04E

⁷ The Maritime and Port Authority of Singapore (Harbour Craft) Regulations.

1.2.1.2 Oshio was built with two wheelhouses⁸, the lower wheelhouse was used by the Master at the time of departing Pandan. A GPS chart plotter⁹, with built-in Class B AIS transponder, was installed at the upper and lower wheelhouses each on 1 August 2023, to display Oshio's position in relation to other vessels in its vicinity. Three sets of VHF¹⁰ (see figure 1) were installed on board Oshio for communication with other vessels and the MPA POCC. All VHF sets had a quick distress button for sending distress alerts. There was no distress alert sent from Oshio nor VHF report made to the MPA POCC at the time of craft taking in water and sinking.



Figure 1 – One of the three VHF sets inside the wheelhouse with annotation of the distress button (*Source: the TSIB*)

1.2.1.3 All harbour craft licenced by the MPA had to be inspected at its first registry and its subsequent annual renewal. The last inspection carried out on board Oshio was at its mooring base on 5 July 2024. Based on Oshio's inspection records, the hull condition was satisfactory, six lifejackets and four lifebuoys were placed on board as part of the life-saving appliances. All these life-saving appliances were found on board Oshio after it was salvaged (see **figure 2**).

⁸ Either the upper or the lower wheelhouse was able to steer the tugboat. Changing over to the upper wheelhouse would be necessary if the view at the lower wheelhouse was blocked.

⁹ ONWA, KP-38A.

¹⁰ Very high frequency, Icom model.



Figure 2 - Lifejackets inside wheelhouse (left) and the resting compartment below deck (right) of Oshio (*Source: the TSIB*)

- 1.2.1.4 According to the Operator, Oshio had undergone a docking from 12 February 2020 to 2 March 2020. During the docking, both its port and starboard hull were renewed and re-painted, engines were fully overhauled, tail shaft and propeller were repaired and reinstalled.
- 1.2.1.5 Oshio, as a tugboat, had a towing system (see **figure 3**) comprising two winch drums, driven by hydraulics, for connecting a tow line, and a quick release arrangement for disconnecting the tow line in an emergency. The towing system was tested and found in operational condition at the last docking. The tugboat was capable of towing harbour craft like YM3.



Figure 3 - View of the towing system located at the aft of Oshio (*Source: the TSIB*)

- 1.2.1.6 According to the Operator, the towing arrangement, i.e. whether the harbour craft was to be towed by a tow line at the stern or by two mooring lines at the side, was at the master's discretion and professional judgement. The MOC recalled that the side-tow arrangement was used as reported by the Master before departing Pandan on the day of occurrence. The Master also used the side-tow arrangement for a harbour craft from Tekong to Pandan a day prior

to the occurrence.

1.2.2 **Workboat YM3**

1.2.2.1 YM3 was last inspected and issued a workboat harbour craft licence by the MPA on 5 April 2024. Its registered mooring base was at Pulau Ubin / Tekong worksite.

1.2.2.2 YM3 was reported having issues starting its engine in July 2024. The Operator planned to rectify the engine issues after it was towed to Tekong. There was no job order scheduled for YM3.

1.3 **Crew's qualifications, roster and roles.**

1.3.1 At the time of occurrence, the Indonesian Master and ED were the only crew on board Oshio. Table 1 indicates both crew's qualifications and experience.

Rank	Age	Qualification	Service with Operator	In-Rank experience	Working hours
Master	39	Local Trade Master ¹¹	2.7 months	> 5 years	On 12H shift including 1H lunch
Engine Driver	35	Class 4 Engineer ¹²	2 years	>5 years	On 12H shift including 1H lunch

Table 1

1.3.2 According to the Operator, the Master was the overall in charge of the towing operation, performing steering of the tugboat and communicating with the port controls in the Port of Singapore via VHF and the Operator via WhatsApp. The Operator also shared that the Master and the ED did not report that they were unwell or unfit for work on the occurrence day.

1.4 **The side-tow arrangement**

1.4.1 The side-tow arrangement was to position YM3's port side to Oshio's starboard

¹¹ A Singapore Harbour Craft Manning Licence issued to the Master on 21 June 2024 and was valid till 6 June 2026. The Licence was valid to use within Singapore Port Limits only.

¹² A Singapore Harbour Craft Manning Licence issued to ED on 8 August 2024 and was valid till 5 July 2025. The Licence was valid to use within Singapore Port Limits only.

side. As per the recollection of the crane barge master, Oshio and YM3 was tied side-by-side with a single loop mooring rope through two pairs of bollards on board both Oshio and YM3 (see **figure 4**).

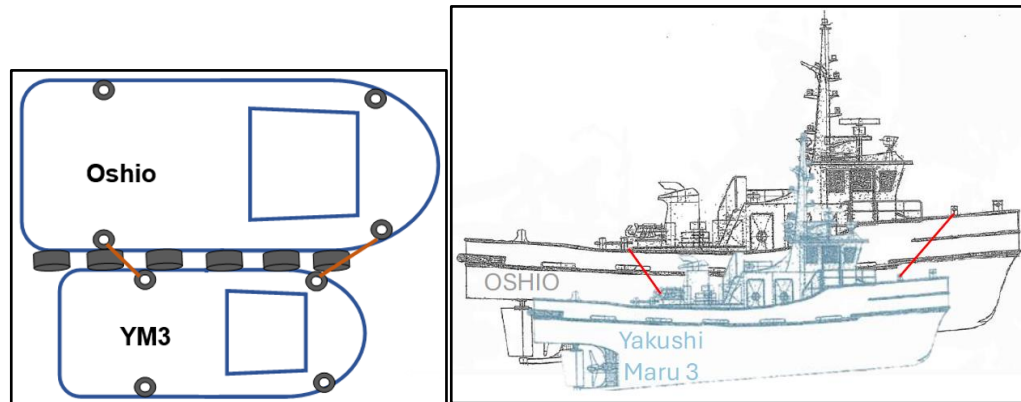


Figure 4 – Sketch illustration on side-tow arrangement (top and side view) (*Source: side view from the Operator*)

- 1.4.2 The video posted on his own WhatsApp Updates by the Master indicated additional loops of the mooring rope (see **figure 5**) had been secured onto the bollards after departing Pandan.

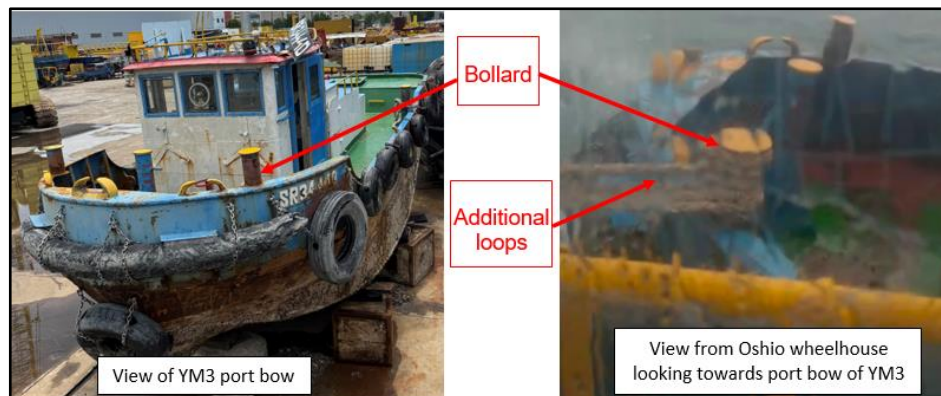


Figure 5 - YM3 at yard (left) and screenshot (right) of the video on the Master's WhatsApp (*Source: the TSIB*)

- 1.4.3 Two mooring ropes with the same specifications¹³ were used to secure the pair of bollards on board both Oshio and YM3 for the side-tow. One of the ropes (see **figure 6**) was found floating on water surface in the vicinity of the sinking site, which was identified by the Operator, to be the one securing the aft

¹³ Polypropylene material, 10m in length and 6 inches in diameter.

bollards.



Figure 6 - Mooring rope used for securing Oshio and YM3
(Source: the Operator)

1.5 Towing operation guidance

- 1.5.1 According to the port regulator (MPA), side-tow of a harbour craft by a tugboat was common and accepted as an industry practice in the Port of Singapore. Prior to carrying out a side-tow operation, the harbour craft operator, or master of the tugboat, was expected to carry out proper assessments of the side-tow operation. Factors to be considered, among others, included the securing arrangement between the two boats, weather and sea condition, etc.
- 1.5.2 A chapter on “Port Towage Industry” in the COSWP provided general guidance on the management of risk involving towage operation, not specific to side-tow. Among others, the guidance highlighted some relevant factors to be taken into considerations when preparing a towage plan and before starting the towage, as follow:
- a) The weather and sea state;
 - b) The visibility;
 - c) The condition of the (towing) equipment, and whether it was in place and fixed correctly;
 - d) Which personnel to allocate to the task;
 - e) The position of tug points, bollard pull and the limits of bitts and bollards; and
 - f) The contingencies in case of emergency.
- 1.5.3 The guidance further highlighted that, after considering the relevant factors and

the findings of a RA, the towage operation was to be planned with appropriate control measures incorporated to protect everyone who may be at risk. For example, the control measures included ensuring no flooding of compartments by closing all watertight openings during towing, ability to release towing mechanism (for a tow connected by a tow line) in an emergency and a clear communication between the tug master and crew.

1.6 Additional information

1.6.1 The passage from Pandan to Tekong

1.6.1.1 Oshio's AIS track records indicated that its highest speed was at about 8.7 knots between 1101H and 1103H, the rest of journey was frequently adjusted at between 2.8 knots and 5.9 knots.

1.6.1.2 The relatively low draft, about one meter and less, allowed Oshio and YM3 to navigate in most places within the port waters. The passage (see **figure 7**) to Tekong typically followed the common route, which involved crossing several anchorages at the eastern side on a north-easterly route.

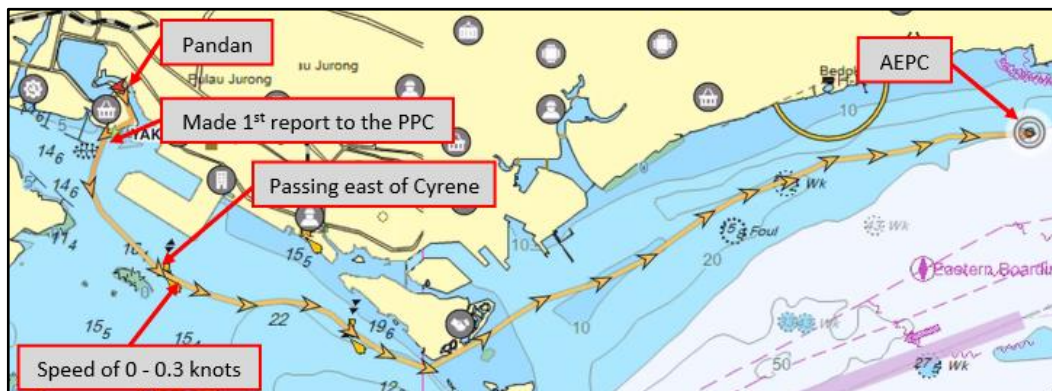


Figure 7 – Overview of the passage taken during the side-tow operation (the light orange coloured track line with arrows) (Source: the MarineTraffic)

1.6.2 Wreck status at seabed

1.6.2.1 Prior to lifting the sunken Oshio and YM3 from the seabed, which was at about 30m deep, several diving operations were carried out to search for persons, but no body was found inside the two craft. The stern of YM3 was found to be deep in the seabed mud. An inspection was also performed and found that both Oshio and YM3 were secured together with mooring rope at the forward

bollards. Mooring rope was not seen at the aft bollards of Oshio and YM3.

1.6.2.2 The diving inspection also made several observations on the sunken Oshio and YM3 as follow:

- a) The mooring rope securing both craft at the forward bollards had two more loops in addition to the single loop made at the departure of Pandan.
- b) All lifejackets and lifebuoys (an example, see **figure 8**) remained on board Oshio.



Figure 8 – Oshio starboard side forward lifebuoy with line and self-igniting light was on (*Source: the diving company*)

- c) The hatch of the resting compartment at forward deck was prevented from closing fully by a bar (see **figure 9**).

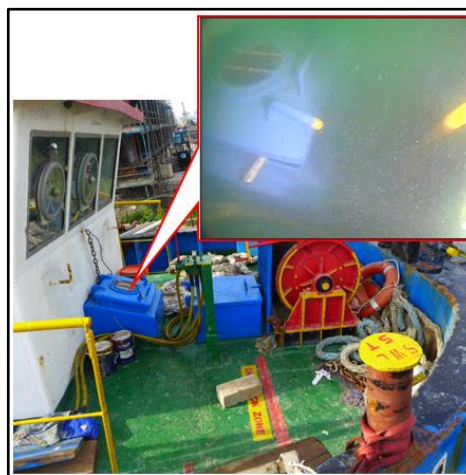


Figure 9 – Oshio's forward hatch was prevented from closing fully by a bar
(Source: the diving company)

- d) On board YM3, the hatch at the midship, the entrance doors at the port and starboard sides were found open (see **figure 10**).



Figure 10 – View of hatch and entrance door
(Source: the diving company)

1.6.3 Wreck inspection at yard

1.6.3.1 The investigation team inspected both wrecks at a yard. The following observations were made:

- a) Both Oshio and YM3 had no visible cracks or damage on their hulls and propeller shaft.
- b) The hydraulic steering system indicator at the aft of Oshio indicated a helm order of starboard 28° (see **figure 11**), which corresponded to a starboard alteration of course from 007° to 035° between 1348H and 1351H on the occurrence day.

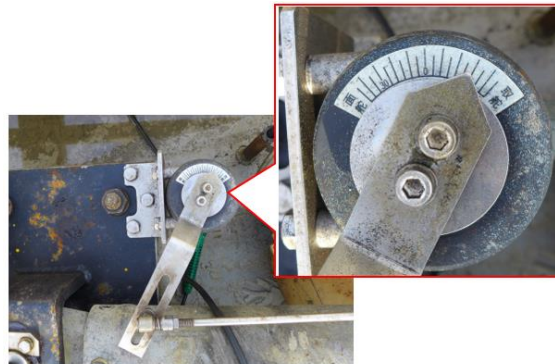


Figure 11 – View of hydraulic steering system indicator (*Source: the TSIB*)

- c) A hanging flexible pipe in the machinery compartment on board YM3 linking to the bilge pump was disconnected (see **figure 12**). The pipe was used for pumping bilge water overboard.



Figure 12 - View of the disconnected bilge pipe inside engine compartment of YM3 (*Source: the TSIB*)

1.7 Incidental observations

1.7.1 The Operator's Standard Operations Manual (SOM)

- 1.7.1.1 The Operator's SOM incorporated the COSWP for safe working practices for its fleet of vessels, and a copy of the COSWP was required by the Operator to be placed on board its fleet of vessels for reference. The investigation team noted that the COSWP was not provided on board Oshio.
- 1.7.1.2 The SOM provided to the investigation team, among others, included following procedures:
- a) navigation and watchkeeping;
 - b) communications;
 - c) preparation for sea;
 - d) operation in port and at anchor;
 - e) duties and responsibilities during emergency;
 - f) shipboard emergency response plans; and
 - g) shipboard emergency drills.
- 1.7.1.3 The procedures listed in the SOM were largely for ocean-going vessels and were not relevant to harbour craft operating within port waters. For example, the procedures indicated that the officer of the watch was required to make the

most effective use of all navigational equipment at the officer's disposal; the composition of watch arrangement on the bridge had to be adequate and appropriate at all times and to consider factors such as use navigational aids like radar. The Master was the sole person on board Oshio for navigating the tugboat, the ED was assisting the Master in areas of engine related matters and mooring to a berth or a mooring buoy and there was no radar installed on board Oshio. The procedures also listed emergency duties assigned to different designations, such as Chief Officer, Second Officer, Second Engineer and Oiler, and these emergency duty designation assignments were not applicable to Oshio.

- 1.7.1.4 An RA for operation and maintenance of tug and barge was created by the MOC and two operation staff ashore on 1 March 2019 and was last reviewed on 1 August 2023. The RA included 21 areas relating to operation and maintenance such as mooring / unmooring of tug and barge, towing of tug and barge, bollard pull test and hot work. There was no RA for side-tow of another harbour craft.
- 1.7.1.5 There was no evidence indicating that both the Master and ED were briefed about the SOM procedures including the RA, nor involved in the RA review.
- 1.7.1.6 The SOM required emergency drills to be carried out regularly, but it did not specify the types of emergency drills and frequency. There was no evidence indicating that emergency drills, such as man overboard and sinking of craft, were conducted in the past involving the Master and the ED.

1.8 **Cause of death**

- 1.8.1 The death certificates for both the Master and ED indicated that the cause of death as drowning. Preliminary investigation carried out by the Police did not suggest any foul play to the death of the Master and ED.

1.9 **Environmental condition**

- 1.9.1 There was no weather or sea condition records found on board Oshio or YM3 for the passage. The 49 second video recording found in the Master's WhatsApp account showed an overcast sky, windy weather, moderate to rough sea conditions with swells and sea spray seen coming on deck.

2 ANALYSIS

2.1 Sinking of the craft

- 2.1.1 The two craft, Oshio and YM3, were on side-tow and experienced windy and high swell environment as shown in Master's video after departing Pandan. The two more loops of mooring rope, as observed during the underwater inspection, could have been added by the Master after experiencing the windy and high swell environment.
- 2.1.2 The wreck inspection indicated that both Oshio and YM3 had no visible cracks or damage on their hulls and propeller shaft. Hence, it is unlikely that the taking in of water was due to hull failure or water leaking through propeller shaft.
- 2.1.3 The depth of Oshio and YM3 was 1.8m and 1.4m respectively. With one metre or less draft, the freeboard of Oshio and YM3 would be about 0.8m and 0.4m respectively. With windy weather, moderate to rough sea condition as well as swells and sea spray, the low freeboard of YM3 could have caused the ingress of water at the stern of YM3 as reported by the Master of Oshio.
- 2.1.4 The following areas on board YM3, had possibly further allowed sea water to enter the compartments of YM3:
- a) The hole (overboard) at the side of YM3 was connected to a flexible pipe used for pumping bilge water out from the machinery space. However, the flexible pipe was found disconnected. As such, sea water could enter the machinery compartment through this hole, though the hole was small; and
 - b) The hatch at the midship and the entrance doors at the port and starboard sides which were found open.
- 2.1.5 The ingress of water into YM3 could have started much earlier as the weather enroute from Pandan to Tekong was windy and high swell seas but not noticed by the Master and ED as the amount of sea water taking in was gradual.
- 2.1.6 The hydraulic steering system indicator shown at starboard 28° revealed that Oshio was executing a starboard turn prior to the sinking. The starboard turn could have exacerbated YM3 taking in more water as the starboard hull of YM3 would be relatively lower facing the rough seas and high swells as moving

ahead during the turn. More sea water could have entered through the starboard entrance door and even the midship hatch at this time.

2.1.7 As reported by the Master, YM3 had taken in water first and followed by Oshio. The sinking YM3 could have pulled down Oshio as both harbour craft had been secured together at the forward and aft bollards. This sequence of sinking occurrence collaborated with the condition of wrecks underwater, where the stern of YM3 was found to be deeper in the seabed mud as compared to the wreck of Oshio.

2.1.8 There was no witness account to the sinking of two harbour craft, the investigation team could not ascertain what activities that the Master was carrying out after making the call to the MOC. It was unknown to the investigation team on the whereabouts of the ED during the occurrence, whether he was below deck, taking rest inside the resting compartment or carrying out maintenance inside the machinery compartment or on deck. It also remains unknown if the ED was aware of YM3 and Oshio were taking in water and sinking.

2.1.9 Both the Master and ED had lost their lives from the sinking occurrence, their bodies were discovered without wearing personal floatation device.

2.2 **Emergency response and preparedness**

2.2.1 The Master made a WhatsApp call to the MOC after noticing the stern of YM3 was taking in water and that Oshio was starting to sink. The MOC in turn alerted the HMD and tried calling the Master and ED. The MOC reported the incident to the MPA PPC for assistance about 23 minutes (1350H – 1413H) after receiving the call from the Master.

2.2.2 It is unclear why the Master had called the Operator instead of activating the quick distress button on the VHF radio equipment or reporting the incident to the port authority (MPA) directly for assistance. The activation of the distress button could alert vessels in the vicinity and the port authority at the same time which would have provided faster assistance or search and rescue effort.

2.2.3 To react appropriately in an emergency requires regular training and practice. Though the Operator's SOM required emergency drills to be carried out regularly, there was no evidence indicating these drills, such as man overboard

and sinking of craft, were conducted in the past involving the Master and ED. These emergency drills would inculcate appropriate actions to take during emergency, such as activating the quick distress button, calling the port authority, looking out for other crew member and donning of flotation devices, to increase the chance of being saved.

2.3 Risk assessment for towage operation

- 2.3.1 The COSWP incorporated in the Operator's SOM provided general guidance on the management of risk involving towage operation, though it was not specific to side-tow. Several risk factors highlighted in the guidance should be taken into considerations when preparing and before starting a towage. For example, the weather and sea state, it was noted that the occurrence day was windy, moderate to rough sea with swells and sea spray coming on deck of Oshio.
- 2.3.2 Another factor is the contingency in case of emergency, it is likely that the contingency for taking in water was not included in the planning of the towage, particularly when both craft were having low freeboard. The Master was most likely in a state of panic as indicated by the shouting over the phone when calling the Operator for assistance. It appears that the Master didn't notice the taking in of water until it was too late and didn't have time to release the mooring rope in time before the sinking of Oshio.
- 2.3.3 For the fact that the watertight openings of YM3 and Oshio were left open, and the hole at the hull of YM3 connected to the flexible pipe linking to the bilge pump was not plugged, it also shows that the risk of taking in water was not considered for this towage operation.
- 2.3.4 The Operator had an RA for operation and maintenance of tug and barge that covered 21 areas, however, there was no RA for side-tow of another harbour craft. There is no evidence suggesting that the Master and ED were familiar with the RA of the 21 areas, particularly those concerning towage operation.
- 2.3.5 Though the side-tow of a harbour craft by a tugboat was a common practice and accepted as an industry practice, the risk involving side-tow could be different from conventional stern-tow. For instance, the release of the towed craft in emergency. In conventional stern-tow, the towed craft is typically secured by a single towline at the stern of the powered towing craft with a quick

release mechanism which Oshio had on board. Releasing the towline in emergency is relatively simple and only at the stern. For side-tow, the two craft are typically secured together in more than one location. In this case, YM3 and Oshio were secured at the front and rear bollards. Releasing YM3 required the crew member getting to the front and rear section of Oshio and cutting the two mooring ropes. The time and effort taken to release the side-towed craft in an emergency is more challenging than stern-tow.

- 2.3.6 Reassessing all possible risks is important when preparing for a side-tow operation. Crew members should be cognisant of the potential risks, be familiar with the control measures put in place to mitigate those risks and take appropriate actions in time of an emergency during a side-tow voyage.

2.4 **The Operator's SOM**

- 2.4.1 Most of the procedures included in the Operator's SOM were largely for ocean-going vessels and were not relevant to harbour craft operating within port waters and were not applicable to Oshio.
- 2.4.2 The investigation team opined that the procedures established should be relevant to the type of vessels in use and area of operations. Though the COSWP was incorporated in the Operator's SOM, it is desirable to extract only the safe working practices applicable to craft operating within port waters and include in the SOM. Incorporating work practices for ocean-going vessels may cause confusion to the crew members.
- 2.4.3 In addition, procedures contained in the SOM should be briefed to crew members and followed strictly, unless otherwise stated. If the SOM required emergency drills to be carried out regularly, the procedures should specify the types and frequency of emergency drill so that its crew members can be guided accordingly. The Operator must ensure that the emergency drills are carried out as planned and achieved its purposes and properly documented.

3 CONCLUSIONS

From the information gathered, the following findings are made. These findings should not be read as apportioning blame or liability to any particular organisation or individual.

- 3.1 YM3 was reported taking in water at its stern while she was towed by Oshio at its side under windy weather and moderate to rough sea conditions with high swells. Both YM3 and Oshio eventually sank and resulted in fatalities of the Master and ED.
- 3.2 The stern of YM3 taking in water was likely due its low freeboard, which was about 0.4m. Water could have entered the compartments and machinery room through the openings such as entrance doors and midship hatch left open and the unplugged hole of YM3.
- 3.3 The sinking of YM3 had likely pulled Oshio down as both craft had been secured together by two mooring ropes.
- 3.4 Both the Master and ED did not wear lifejackets or other personal floatation devices prior to the sinking of the craft.
- 3.5 The Master did not send a distress alert nor report to the port authority directly, which had likely delayed the rescue efforts. There were no emergency drills, such as man overboard and sinking of craft conducted, in the past involving the Master and ED.
- 3.6 There was no RA carried out for the side-tow operation by the Master and ED but relied on previous experience. The RAs of 21 areas for operation and maintenance of tug and barge reviewed by the Operator were not relevant to side-tow operation.
- 3.7 The Operator's SOM were largely for ocean-going vessels and were not relevant and implementable to its fleet of vessels operating within port waters.

4 SAFETY ACTIONS

Arising from discussions with the investigation team, the Operator (Oung Marine Services (S) Pte Ltd) had taken the following safety actions.

- 4.1 After the occurrence, the Operator carried out a full inspection to all its fleet of vessels to ensure all of them had been maintained in good condition. The inspection was completed in December 2024.
- 4.2 The Operator reviewed its SOM and revised the emergency drill procedures to require all its fleet of vessels to carry out the following drills:
 - a) Craft flooding once every quarter;
 - b) Man overboard once every six-month; and
 - c) Fire and abandon ship once every month.
- 4.3 All drills listed in paragraph 4.2 had been carried out on board its fleet of vessels and completed in December 2024. All crew members were familiar with the procedures and actions to be taken in an emergency, including donning of lifejackets prior to the sinking of the craft when craft is flooded.
- 4.4 An in-house training system had been set up for training on the operational needs which shore and crew members would be involved. The training is to be conducted by the MOC and HMD or Work Safety and Health Manager. For example, conducting risk assessment for different types of operations, mooring operations, permit to work and using of lifesaving equipment on board craft for survival in an emergency.
- 4.5 A briefing on how to conduct RA to its fleet crew members was carried out on 25 October 2024.

5 SAFETY RECOMMENDATIONS

A safety recommendation is for the purpose of preventive action and shall in no case create a presumption of blame or liability.

For the Operator (Oung Marine Services (S) Pte Ltd):

- 5.1 To implement a system to ensure risk assessments are carried out by the crew members involved in a side-tow operation before commencement of the passage. **[TSIB Recommendation RM-2025-001]**
- 5.2 To review and ensure its Standard Operations Manual contains safe working practices that are relevant to its type of vessels and operations. **[TSIB Recommendation RM-2025-002]**
- 5.3 To review the procedures in its SOM to ensure that the procedures listed are relevant and implementable for its fleet of vessels. **[TSIB Recommendation RM-2025-003]**