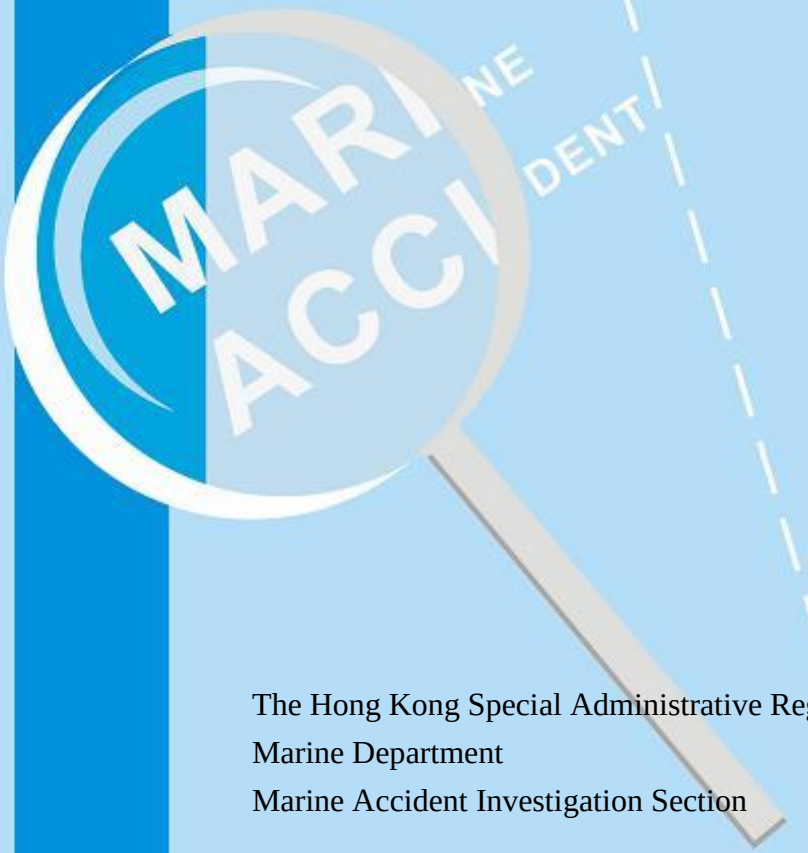
Report of investigation into the fatal accident on board the Hong Kong registered bulk carrier "*Qing Ping Shan*" at Astoria anchorage, Columbia River, USA on 30 January 2021



The Hong Kong Special Administrative Region
Marine Department
Marine Accident Investigation Section

7 April 2022

Purpose of Investigation

The purpose of this investigation, conducted by the Marine Accident Investigation Branch (MAIB) of Marine Department, is to determine the circumstances and the causes of the incident with the aim of enhancing the safety of life at sea and avoiding similar incidents in future.

It is not intended to apportion blame or liability towards any particular organization or individual except so far as necessary to achieve the said purpose.

The MAIB has no involvement in any prosecution or disciplinary action that may be taken by the Marine Department resulting from this incident.

Table of contents **Page**

Summary

At 0530 hours on 29 January 2021, a Hong Kong registered bulk carrier "Qing Ping Shan" (*the vessel*) dropped anchor at Astoria anchorage in the Columbia River, USA, awaiting berthing instruction for loading wheat in bulk.

In the afternoon of 30 January 2021, the main engine of *the vessel* was tested under engine control room (ECR) control mode after obtaining the agreement with the Chief Engineer (C/E) and approval from the duty officer on the bridge. After the completion of the test at about 1451 hours, the First Engineer (1/E) made a telephone call to the Fitter's cabin informing him to arrange the cleaning of the engine room as instructed by the C/E, but nobody answered. The 1/E then searched the engine room for the Fitter. At about 1500 hours, the Fitter was found seriously injured, lying unconsciously on the engine room (E/R) tank top between the main engine flywheel and the main lubrication oil pump with a paint bucket and a roller at his side. The Fitter was sent ashore for emergency medical treatment, but unfortunately, the shore doctor declared him dead at 1601 hours on the same day.

The investigation identified that the contributory factors leading to this accident were that the crew members failed to follow the requirements of "Shipboard Safe Working Instruction" of shipboard Safety Management System (SMS); the Fitter was lack of safety awareness underestimating the risk of working adjacent to the main engine flywheel; and the crew members were lack of effective communication for the main engine test versus the maintenance work adjacent to the flywheel of the main engine.

1. Description of *the vessel*

Ship name	:	*Qing Ping Shan* (Figure 1)
Flag	:	Hong Kong, China
Port of registry	:	Hong Kong
IMO number	:	9741504
Type	:	Bulk Carrier
Year built, shipyard	:	2014, China Shipping Industry (Jiangsu) Co., Ltd.
Gross tonnage	:	36,388
Net tonnage	:	21,647
Length overall	:	199.90 metres
Breadth	:	32.26 metres
Engine power, type	:	8050 kW, MAN B&W 5S60ME-C8.2
Classification society	:	China Classification Society
Registered owner	:	Oriental Fleet International Company Limited
Management company	:	COSCO SHIPPING BULK CO., LTD.

Figure 1: *The vessel*

2. Sources of evidence

2.1 Information provided by the Master, the crew members and the management company (*the Company*) of *the vessel*.

3. Outline of events

(All times were local time UTC - 8 hours)

3.1 *The vessel* departed the port of Lianyungang, China on 11 January 2021 in ballast condition, bounding for Kalama, USA for loading wheat in bulk. *The vessel* arrived at Astoria anchorage in the Columbia River, USA and dropped anchor at 0530 hours on 29 January 2021. The main engine of *the vessel* remained on standby under the bridge control mode during anchoring.

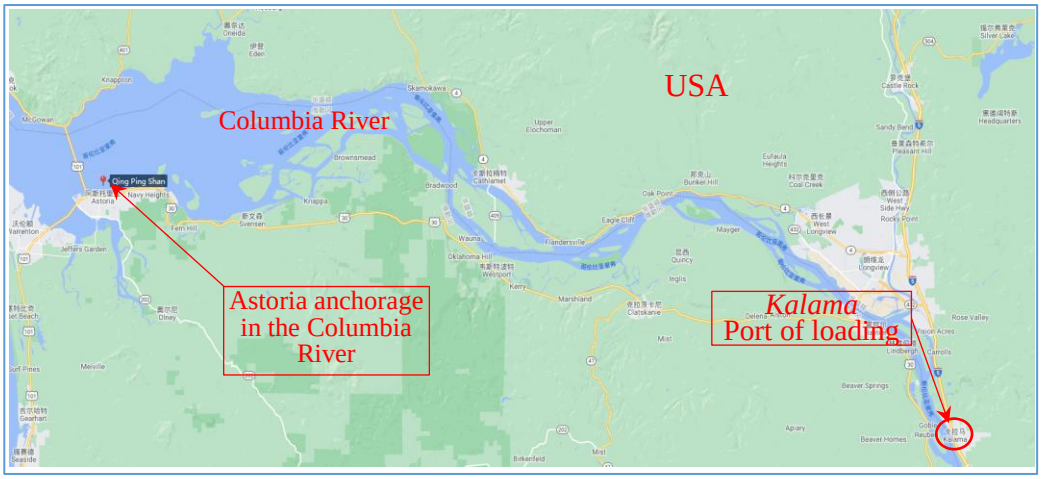


Figure 2: Location of Astoria anchorage and port of loading Kalama

3.2 A toolbox meeting was held by 1/E in the morning on 30 January 2021. The 1/E briefed the engine crew members, including the Fitter, on the safety requirements of steel plate cutting at the meeting.

3.3 At about 1411 hours on 30 January 2021, the Fitter went to the ECR to report his duty to the 1/E. He left the ECR one minute later when he noticed the 1/E was not there.

3.4 At about 1436 hours, the 1/E came to the ECR and asked the Chief Engineer (C/E) if the main engine would be tested in verifying the running conditions of the main engine after changing to the low sulphur marine gasoil. The C/E agreed to the test.

3.5 With the approval received from the bridge, the main engine was changed to ECR control mode from bridge control mode. In order to ensure that there was no water or oil leakage to the combustion

chamber, the C/E informed the 1/E to open all the indicator cocks of the main engine for blow-through by the starting air.

3.6 At about 1446 hours, the engine telegraph, which was linked with the fuel controller, was put to "Dead slow ahead" by the C/E for a period of about 5 to 6 seconds. Noting that a normal reading was shown on the revolution indicator and air blow-through sound was heard from the indicator cocks, the C/E pulled back the engine telegraph to the stop position. The 1/E then closed all the indicator cocks and returned to ECR. At about 1451 hours, the main engine was changed to bridge control mode by the C/E.

3.7 As instructed by the C/E, the 1/E arranged the engine room cleaning and made a telephone call to the cabin of the Fitter, but nobody answered. The 1/E then looked for the Fitter in the engine room. At about 1500 hours, the Fitter was found lying on the E/R tank top between the main engine flywheel and the main lubrication oil pump with a paint bucket and a roller at his side. The 1/E called the Fitter, but no response. He then rushed upstairs for assistance. The duty officer on the bridge was informed of the incident.

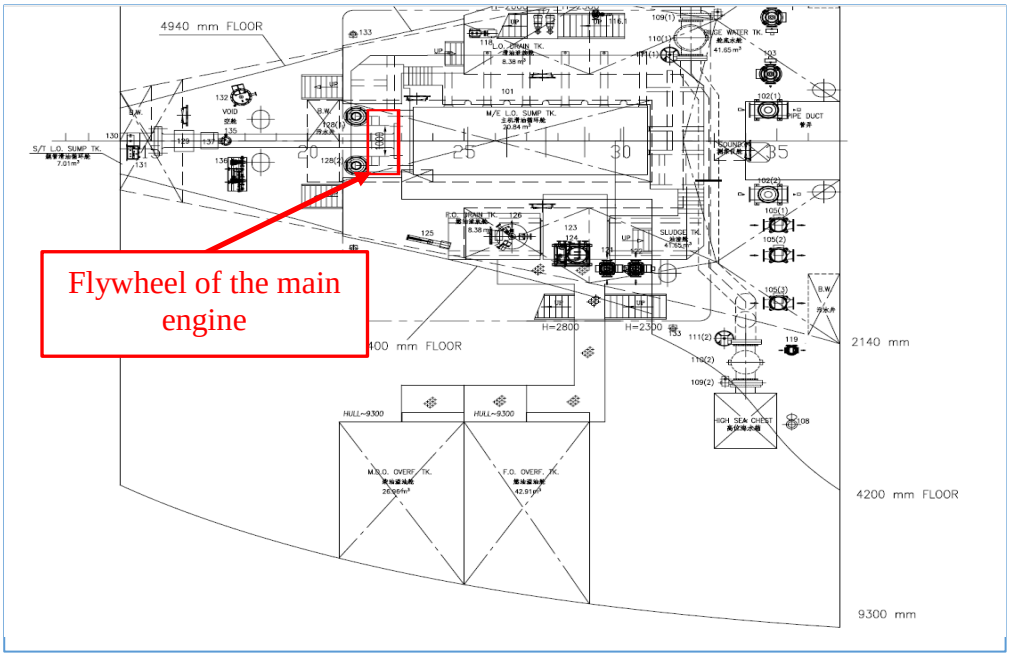


Figure 3: The location of the main engine flywheel

3.8 The duty officer on the bridge relayed the message to the master and announced the incident to all crew members through the public

address system. When receiving the notice, the master proceeded to the bridge to organize the rescue operation. At about 1518 hours, the Fitter was rescued out of the engine room and shifted to the hospital of *the vessel*. The chief officer arrived at the hospital to assess the situation of the Fitter at 1519 hours. The master informed *the Company* that the Fitter fainted in the engine room with his injury unknown.

3.9 At 1520 hours, the Fitter was still unconscious with blue lips, feeble breathing and pulse. Cardiopulmonary resuscitation was performed on him. The master further reported to *the Company* that the Fitter might have been hit by the flywheel on his neck under ears with a bruise on the back but no bleeding.

3.10 At 1522 hours, the master contacted the local agent to assist in the rescue operation. At 1524 hours, the master reported to the United States Coast Guard (USCG) to request emergency medical assistance.

3.11 At 1530 hours, the USCG rescue boat arrived. The Fitter was sent ashore for emergency medical treatment under the escort of other 6 crew members at 1545 hours.

3.12 At 1548 hours, the Fitter was carried out further first-aid treatment at the ambulance. Unfortunately, at 1601 hours, the doctor declared the Fitter dead.

4. Analysis

The vessel's certificates and manning

4.1 The statutory trading certificates of *the vessel* were valid and in order. *The vessel* was manned by 24 crew members, including the Master.

4.2 The Master had worked in *the Company* since 2015 and joined *the vessel* on 25 August 2020. He had about 6 years of experience as a master. He possessed a Master Certificate of Competency issued by China valid until 6 May 2025.

4.3 The Chief Engineer joined *the vessel* on 12 July 2020. He had about 11 years of experience as a chief engineer. He possessed a Chief Engineer Certificate of Competency issued by China valid until 30 December 2024.

4.4 The First Engineer joined *the vessel* on 25 August 2020. He had about 5 years of experience as a first engineer. He possessed a Chief Engineer Officer Certificate of Competency issued by China valid until 13 November 2023.

4.5 The Fitter joined *the vessel* on 25 August 2020. He had about 6 years of experience as a fitter.

4.6 There was no abnormality noted with regard to the certification and qualification of the crew concerned.

Fatigue, alcohol and drug abuse

4.7 There was no evidence to show that any crew on board suffered from either fatigue at work or abuse of alcohol and drugs.

Weather and sea conditions

4.8 The weather was overcast with drizzle and easterly wind of Beaufort wind scale force 4. The sea was slight. The weather and the sea conditions were not considered to be the contributory factors to the accident.

Cause of death

4.9 The Certificate of Death issued by the Oregon Health Authority stated that the deceased was crushed by an engine flywheel while painting the floor adjacent to or beneath the engine. The immediate cause of death was internal decapitation due to blunt force injury of the neck.

4.10 According to the accident investigation report from *the Company*, the Fitter was found lying on the E/R tank top between the main engine flywheel and the main lubrication oil pump with a paint bucket and a roller at his side. It was deduced that the Fitter might be doing some cleaning or painting work at the accident scene. (Figure 4)

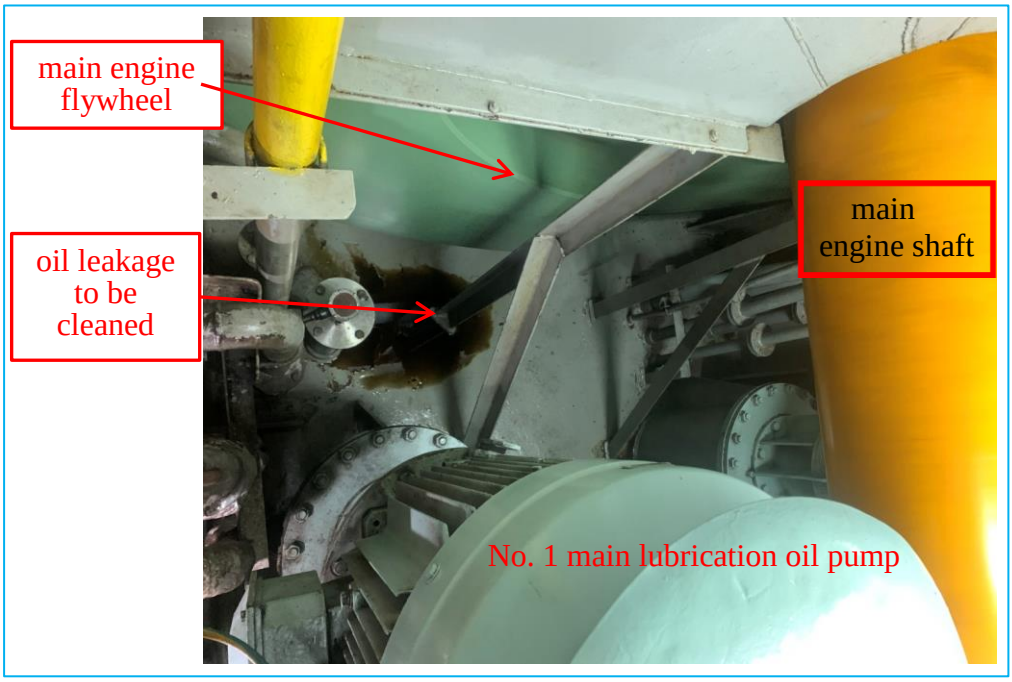


Figure 4: The accident scene

4.11 The investigation also deduced that the rotating flywheel hit the Fitter during the main engine test when he was alone doing some cleaning or painting work near or underneath the flywheel. The Fitter failed to dodge quickly to keep himself clear of the rotating flywheel due to the limited space around him when the flywheel of the main engine suddenly moved, resulting in his death.

Implementation of Safety Management System on board

4.12 "Routine Maintenance of Engine Room" of the shipboard

Occupational Health and Safety Operation Manual (Document No.: OHSAS24) stipulates that the risks included the moving parts, no effective warning markings and lack of supervision, may cause personal injuries.

4.13 Paragraph 2.2 of the "Shipboard Safe Working Instruction" (Document No.: SMI-S-J06) states that the crew member(s) should identify the hazards that may occur and take preventive measures to ensure such hazards to be under control before starting work. This is through checking the working area with its surroundings and assessing all steps of the shipboard operation to be performed. It also states that supervision on the work scene should be conducted. However, there was no evidence to show that the Fitter or his supervisor carried out a risk assessment before carrying out the maintenance work at the E/R tank top near the flywheel. Neither warning label of "maintenance work near the flywheel" was placed in the engine control room and wheel house, nor supervision was carried out on the scene when the Fitter was carrying out the maintenance work near the flywheel.

4.14 Paragraph 2.1 of the SMI-S-J06 states that a toolbox meeting should be held before the commencement of work. The 1/E held the toolbox meeting in the morning of 30 January 2021 with the attendance of the Fitter. The toolbox meeting only included the steel plate cutting work, excluding maintenance work near the flywheel and the main engine test. If the routine maintenance work adjacent to the flywheel and the main engine test were included in the toolbox meeting or an additional toolbox meeting arranged for the main engine test, this accident might have been avoided.

4.15 The investigation revealed that the SMI-S-J06 of the shipboard SMS was not properly implemented on board by the crew members, which contributed to the accident.

Safety awareness of working adjacent to the flywheel of the main engine and shipboard communication

4.16 Chapter 20.5.5 of the Code of the Safe Working Practices for

Merchant Seafarers states [1] that maintenance or repairs to, or immediately adjacent to, moving machinery should be permitted only in circumstances where no danger exists or where it is impracticable for the machinery to be stopped.

4.17 Although the Fitter had about 6 years of experience at the rank of a fitter and also being a safety work supervisor for engine room ratings according to paragraph 2.2.3(1) of the SMI-S-J06, it was incomprehensible that the Fitter chose to carry out the routine maintenance work at the E/R tank top near the flywheel when the main engine was on standby under the bridge control mode. The only reason that could explain the Fitter's decision to work there was that he did not realize that the main engine might start at any moment. The investigation revealed that the Fitter was lack of safety awareness and underestimated the risk of working adjacent to the flywheel of the main engine.

4.18 The Fitter might have a chance to report his duty to the 1/E, i.e., his supervisor, in the afternoon of 30 January 2021 but failed because the 1/E was not in the ECR. However, the Fitter carried out the maintenance work adjacent to the flywheel alone when the main engine was on standby under the bridge control mode, without informing other crew members. There was no evidence to show that an additional toolbox meeting or notification among the engine crew members was carried out before the main engine test. It revealed that the communication among the crew members was ineffective.

[1] Section 4 of Cap.478M "Merchant Shipping (Seafarers) (Code of Safe Working Practices) Regulation" refers. (https://www.elegislation.gov.hk/hk/cap478m)

5. Conclusions

5.1 At 0530 hours on 29 January 2021, *the vessel* dropped anchor at Astoria anchorage in the Columbia River, USA, awaiting berthing instruction for loading wheat in bulk.

5.2 In the afternoon of 30 January 2021, the main engine of *the vessel* was tested under ECR control mode after obtaining agreement from the C/E and approval from the duty officer on the bridge. At about 1451 hours after the completion of the main engine test, the 1/E made a telephone call to the Fitter's cabin for arranging the engine room cleaning as instructed by the C/E, but nobody answered. The 1/E then searched the engine room for the Fitter. At about 1500 hours, the Fitter was found seriously injured, lying unconsciously on the E/R tank top between the main engine flywheel and the main lubrication oil pump with a paint bucket and a roller at his side. The Fitter was sent ashore for emergency medical treatment, but unfortunately, the shore doctor declared him dead at 1601 hours on the same day.

5.3 The investigation revealed that the main contributory factors led to the accident were as follows:

(a) the crew members failed to follow the requirements of "Shipboard Safe Working Instruction" of shipboard SMS;

(b) the Fitter was lack of safety awareness and underestimated the risk of working adjacent to the main engine flywheel; and

(c) the crew members were lack of effective communication for the main engine test operation versus the maintenance work adjacent to the flywheel of the main engine.

6. Recommendations

6.1 The management company should issue circulars informing all masters, officers and crew members of its fleet of the findings of the investigation and lessons learnt from this accident and instruct them to:

(a) enhance safety awareness and safety culture onboard to ensure a risk assessment to be conducted before commencing work to determine the potential hazards;

(b) strictly follow the requirements of the "Shipboard Safe Working Instruction" of the shipboard SMS, especially for the routine maintenance work of the engine room; and

(c) enhance the communication among the crew members before conducting the key operations such as main engine test, maintenance or repairs work adjacent to moving machinery, etc.

6.2 A Hong Kong Merchant Shipping Information Note is to be issued to promulgate the lessons learnt from this accident.

7. Submission

7.1 The draft investigation report, in its entirety, was sent to the Company and the Master of *the vessel* for comments.

7.2 By the end of the consultation, there was no comment received from the above-mentioned parties