

MA2013-9

**MARINE ACCIDENT
INVESTIGATION REPORT**

September 27, 2013



The objective of the investigation conducted by the Japan Transport Safety Board in accordance with the Act for Establishment of the Japan Transport Safety Board is to determine the causes of an accident and damage incidental to such an accident, thereby preventing future accidents and reducing damage. It is not the purpose of the investigation to apportion blame or liability.

Norihiro Goto
Chairman,
Japan Transport Safety Board

Note:

This report is a translation of the Japanese original investigation report. The text in Japanese shall prevail in the interpretation of the report.

MARINE ACCIDENT INVESTIGATION REPORT

August 22, 2013

Adopted by the Japan Transport Safety Board

Chairman	Norihiro Goto
Member	Tetsuo Yokoyama
Member	Kuniaki Shoji
Member	Toshiyuki Ishikawa
Member	Mina Nemoto

Accident Type	Fatal accident involving a superintendent
Date and Time	Unidentified : between 03:15 and 07:25, October 6, 2012 (local time, UTC + 9 hours)
Location	Kudamatsu Coal Transshipment Terminal, Tokuyama-Kudamatsu Port, Yamaguchi Prefecture (approximately 33°58.7' N, 131°53.2' E)
Summary of the Accident	While the cargo ship SAGE SAGITTARIUS was unloading coals from the cargo holds by operating unloaders of the automatic unloading device at Kudamatsu Coal Transshipment Terminal in Tokuyama-Kudamatsu Port on October 6, 2012, Superintendent under boarding the vessel for undertaking the maintenance of the device and instructing the method of operation was found trapped in feeder conveyor roller of the unloader at about 07:25 and was confirmed dead.
Process and Progress of the Investigation	<p>(1) Set up of the Investigation The Japan Transport Safety Board appointed an investigator-in-charge (from the Hiroshima Regional Office) and a regional investigator to investigate this accident on December 13, 2012. Later, the Board appointed another investigator-in-charge and a marine accident investigator.</p> <p>(2) Comments from Parties Relevant to the Cause Comments on the draft report were invited from parties relevant to the cause of the accident.</p> <p>(3) Comments from the Flag State Comments on the draft report were invited from the flag State of SAGE SAGITTARIUS.</p>
Factual Information	<p>Vessel type and name: Cargo ship SAGE SAGITTARIUS</p> <p>Port of registry: Panama, Republic of Panama</p> <p>Gross tonnage: 73,427</p> <p>IMO number: 9233545</p> <p>Owner: HESPERUS MARITIMA S.A. (Republic of Panama)</p> <p>Management company: Hachiuma Steamship Co., Ltd (hereinafter referred to as "Company A")</p>

Class:
 L × B × D:
 Hull material:
 Engine:
 Output:
 Date of launch:

Nippon Kaiji Kyokai (Class NK)
 234.93 m × 43.00 m × 25.40 m
 Steel
 Diesel engine
 15,300 kw
 December 27, 2000



Photo 1: Vessel's Full View

Information on the Unloaders

- (1) SAGE SAGITTARIUS was furnished with a automatic unloading device on the upper deck, which consisted of two unloaders and each one of longitudinal, transverse and boom conveyors.
- (2) Each of the unloaders, designed to catch and hoist coals from the cargo holds, consisted of such parts as a trolley, a grab, a hopper, a feeder conveyor and a girder. Feeder conveyor passages were placed on both sides of the conveyor belt inside the feeder conveyor.

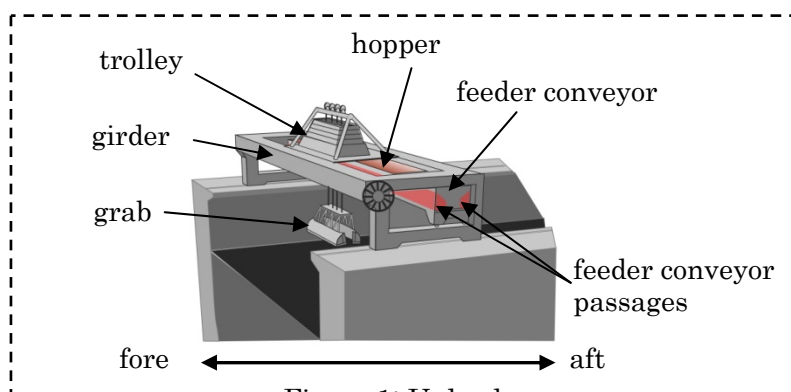


Figure 1: Unloader

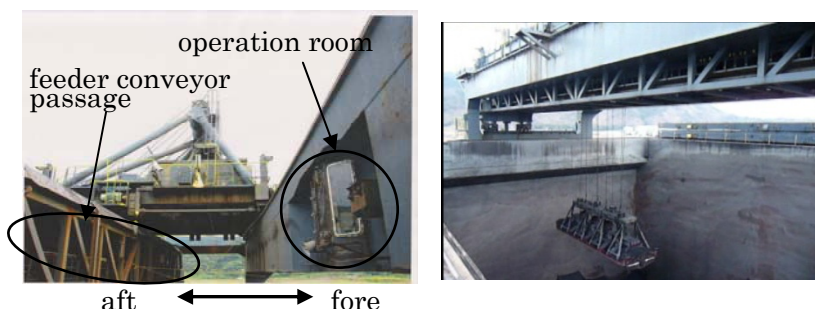


Photo 2: Unloader

	<p>(3) The specifications of the unloaders were as follows (excerpt).</p> <p>(a) Unloading cycle: 87 seconds/cycle on average</p> <p>(b) Hoisting load: 49 tons (27 tons for unloading coals with 22 tons for the grab's self-weight)</p> <p>(c) Feeder conveyor</p> <ul style="list-style-type: none"> • transport capacity: 975 tons/hour • belt speed: 40 meters/minute <p>(4) The procedure for unloading coals was as follows.</p> <p>(a) Moving to the position above the coals to hoist, the unloader lowers the grab to catch the coals.</p> <p>(b) Going up and stopping at a predetermined height, the grab carrying the coals is opened when the hopper and feeder conveyor have moved just under the grab. During that time, the feeder conveyor passages move together with the feeder conveyor.</p> <p>(c) After passing through the hopper, the coals are dropped onto the feeder conveyor and conveyed to the longitudinal conveyor on the starboard side. Thereafter, the hopper, feeder conveyor and its passages return to their original positions.</p> <p>(d) The coals are transferred to coal storage silos by way of such transport gears as the longitudinal conveyor on the starboard side, transverse conveyor in front of the accommodation space, slewing-type boom conveyor and shore-side conveyor constructed on the sea.</p> <p>(5) The warning system was to be activated to turn on the sound and revolving warning light whenever the unloader moved. However, it was not the case with the hopper, feeder conveyor and its passages.</p> <p>(6) A floodlight was set up along the feeder conveyor passages.</p>
<p>Crew Information</p>	<p>(1) Master (Nationality : Republic of the Philippines), Male, 56 years old</p> <ul style="list-style-type: none"> • Endorsement attesting the recognition of certificate under STCW regulation I/10 (issued by Republic of Panama) Date of revalidation : June 7, 2011 (valid until April 27, 2016) <p>(2) Superintendent, Male, 37 years old</p> <ul style="list-style-type: none"> • After boarding as an engineer for nine years since 2001, he had worked as Superintendent (hereinafter referred to as "SI") since June in 2010. • He had been in charge of the Vessel since one year and a half before. • He usually worked between 08:00 and 18:00, and coped with a case of emergency at any time. • His health condition did not seem to have the problem.

Injuries to Persons	One fatality (SI)
Damage to Vessel (or Other Facilities)	None
Events Leading to the Accident	<p>(1) Movement of the Vessel</p> <p>(a) The Vessel was loaded with coals and departed from Newcastle Port, Commonwealth of Australia for Japan on September 17 with Master, 24 crew members (all with Philippine nationality), SI and another person on board.</p> <p>(b) The Vessel berthed alongside at Kudamatsu Coal Transshipment Terminal in Tokuyaka-Kudamatsu Port at about 07:30 on October 3, 2012.</p> <p>(2) Cargo handling situation</p> <p>(a) According to the plan laid by Sankyu Inc. (hereinafter referred to as “Company B”), the unloading of coals from the cargo holds of the Vessel was to be started at about 17:00 on October 3, and to be completed during October 6.</p> <p>(b) The gang of stevedores of Company B in charge of the coal unloading work by operating No.1 unloader (hereinafter referred to as “No.1”) consisted of a foreman, an operator and a deckman.</p> <p>(3) Course of the events</p> <p>While the Vessel was unloading coals from the cargo holds by operating No.1 at Kudamatsu Coal Transshipment Terminal, SI was informed by a stevedore that the feeder conveyor of No.1 was making an abnormal noise. Therefore, SI identified the feeder conveyor roller which was generated abnormal noise (hereinafter referred to as “the Roller”). Accordingly, SI stopped the abnormal noise by lubricating the Roller without stopping the operation of No.1. As the Roller made an abnormal noise again while the coal unloading work was going on, SI told a stevedore that he would lubricate the Roller about every three hours.</p> <p>Informed by a stevedore that the Roller was making an abnormal noise at about 02:00 on October 6, SI replied that he would go to check the situation later on.</p> <p>At about 03:15, an able seaman of the Vessel saw SI walking toward No.1 with a torch lamp.</p> <p>At about 07:25, finding a human leg protruding above the feeder conveyor passage of No.1, the operator in the operation room of No.1 put No.1 to an emergency stop and radioed to the deckman for confirming the situation. The deckman found SI trapped in the Roller.</p> <p>The ambulance crew of the Kudamatsu City Fire Station in response to the notification boarded on the Vessel at about 07:42, and then confirmed the death of SI.</p>

The crew of the Vessel started removing the Roller and other related works at about 07:50. The ambulance crew carried SI out of the Vessel at about 08:54. On the other hand, a broken lubricating oil can was found near the feeder conveyor of No.1.

The autopsy diagnosed the cause of SI's death as suffocation by chest compression.

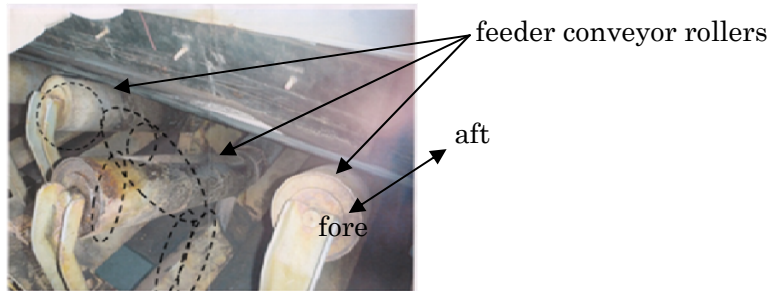


Photo3: The Site Where the Accident Occurred

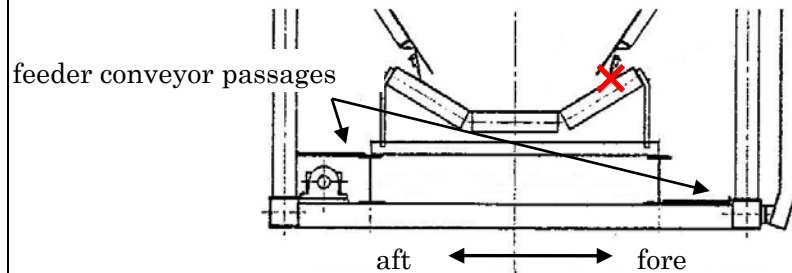


Figure 2: The Site Where the Accident Occurred

Other Matters

- (1) Because the entire crew of the Vessel changed at Newcastle Port, SI boarded the Vessel at the port for undertaking the maintenance of the automatic unloading device and educating as well as instructing how to operate it.
- (2) Company A was in charge of supporting and maintaining the automatic unloading device, while Company B was in charge of implementing unloading work by operating the device.
- (3) The operating manual of the automatic unloading device described the following precautions when operating the device.

Operation of the device should be immediately stopped when an abnormal noise or vibration is sensed, and the cause of such abnormalities should be examined before taking appropriate measures. Keeping the device in operation in negligence of such abnormalities may lead to the occurrence of a major accident.
- (4) Replacing feeder conveyor rollers required the unloading work to be suspended for about one hour.
- (5) The bearings used for the feeder conveyor rollers were shield-type, manufactured with no lubrication structure.

<p>Analysis</p> <p>Involvement of Crew</p> <p>Involvement of Hull, Engine, etc.</p> <p>Involvement of Weather and Sea Conditions</p> <p>Analysis of the Findings</p>	<p>Applicable</p> <p>Applicable</p> <p>Not applicable</p> <p>(1) The cause of SI's death was suffocation by chest compression.</p> <p>(2) It is probable that SI told a stevedore that he would lubricate the Roller about every three hours, because the Roller generated an abnormal noise again even after SI stopped the abnormal noise by lubricating the Roller without stopping the operation of No.1 while the Vessel was unloading coals from the cargo holds by operating No.1 at Kudamatsu Coal Transshipment Terminal in Tokuyama-Kudamatsu Port.</p> <p>(3) It is probable that SI replied that he would go to check the situation later on when informed by a stevedore that the Roller were making an abnormal noise at about 02:00 on October 6.</p> <p>(4) It is probable that according to the findings that an able seaman of the Vessel saw SI walking toward No.1 with a torch lamp at about 03:15 and that a stevedore found SI trapped in the Roller at about 07:25 while the Vessel was engaged in unloading work by operating the automatic unloading device, SI was caused to be dead by having been trapped in the Roller between these times.</p> <p>(5) It is probable that according to the findings that a broken lubricating oil can was found near the feeder conveyor of No.1, SI was trapped in the Roller when he was lubricating the Roller by himself in the feeder conveyor passages without stopping the operation of No.1. However, it was not possible to determine the situation in which he was trapped in the Roller because there were no witnesses of the accident.</p> <p>(6) It is somewhat likely that because of the following reasons, SI tried to manage the situation only by lubricating the Roller without replacing them.</p> <p>(a) The new crew after changing entirely at Newcastle Port were unaccustomed to replacing feeder conveyor rollers.</p> <p>(b) Replacing the Roller required the unloading work to be suspended for about one hour.</p> <p>(7) It is probable that SI was lubricating the Roller in the feeder conveyor passage without stopping the operation of No.1, and it was also probable that he was required to pay attention to the movement of the grab, according to the findings that the feeder</p>
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	<p>conveyor and its passages moved fore and aft as the grab moved, which might possibly break down SI's posture while working in the feeder conveyor passage, and that the warning system was not to be activated when the feeder conveyor passages and others moved. However, it is somewhat likely that only a single floodlight set up in the feeder conveyor passages was not bright enough for making it possible to confirm the movement of the grab while working at night.</p>
Probable Causes	<p>It is probable that the accident occurred because SI was trapped in the Roller while lubricating the Roller in the feeder conveyor passage after being informed that the Roller were making an abnormal noise again, as the Roller were to be lubricated every three hours after SI managed to stop the previous abnormal noise in the feeder conveyor by lubricating the Roller without stopping the operation of No.1 while the Vessel was unloading coals from the cargo holds by operating No.1 at Kudamatsu Coal Transshipment Terminal in Tokuyama-Kudamatsu Port.</p>
Safety Actions	<p>After the accident, Company A implemented the following measures.</p> <ol style="list-style-type: none"> (1) Gratings for preventing from getting trapped in feeder conveyor rollers were installed along a feeder conveyor and a longitudinal conveyor. (2) A switch and an activating wire for putting a conveyor to an emergency stop were installed in a feeder conveyor. (3) Additional floodlights were set up along feeder conveyor passages. (4) A safety manual was made prescribing such measures as suspending the unloading work before replacing conveyor rollers when they were making an abnormal noise.