

[MSI Report 2022-006]



Marine Safety Investigation Report on General Cargo Ship YUJIN ACE

– Fatality of a crew member –

Accident Date : 2019.06.28.

Publication Date : 2022.12.05.



Korea Maritime Safety Tribunal
Marine Safety Investigation Team

Note

This marine safety investigation report aims to identify the causes of the marine accidents and prevent similar marine accidents or incidents in the future under Article 18.3 of the Act on the Investigation of and Inquiry into Marine Accidents. It is therefore advised that this report not be used for assigning blame or determining liability.

The names of the relevant acts and agencies described in this report were quoted at the time of its writing.

Contents

1. Executive Summary	3
2. Factual Information	7
2.1 Ship Particulars	7
2.2 Shipowner and Operation	9
2.3 Ship Survey and Safety Management	9
2.4 Crew Members	9
2.5 Ship Structures	10
2.6 Weather Conditions	12
3. Development of Accident	15
3.1 Before an Accident	15
3.2 Accident Occurring	15
4. Analysis	19
4.1 Cause of Death	19
4.2 Confirm Safety Procedures for working at height and risk to the work environment	19
4.3 Confirm Safety Procedures for loading and unloading operations	20
5. Conclusion	25
6. Lesson	29

section

1

Accident Outline

1. Accident Outline

- 1.1 The YUJIN ACE, as a general cargo ship, sailed into Port Klang in Malaysia and completed the unloading of Hot Rolled Coil around 21:00 on June 28, 2019, and around 23:00, the pilot embarked on the cargo ship to sail out.
- 1.2 At around 23:30 on the day, five crew members, including Able seamen(AB) (the deceased), started to close the pontoon hatch covers of the Second Deck by a ship crane. At around 23:35, to lift the hatch cover from away the lower deck, the crew members connected the cargo hook with the hatch cover, and stepped back to the marginal sides not to collide with the moving cover when the crane was lifting it.
- 1.3 Then, the ordinary seaman(OS) stepping back to the marginal sides heard something falling loudly and then found the Able seamen(AB) working together fallen onto the cargo hold floor(tank top) from Second Deck.
- 1.4 The Able seamen(AB), who had fallen onto the cargo hold floor, died on June 29, 2019, at around 00:13 in the ambulance while being taken to a local hospital by ambulance that arrived at around 23:45 on the site.

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2

Factual Information

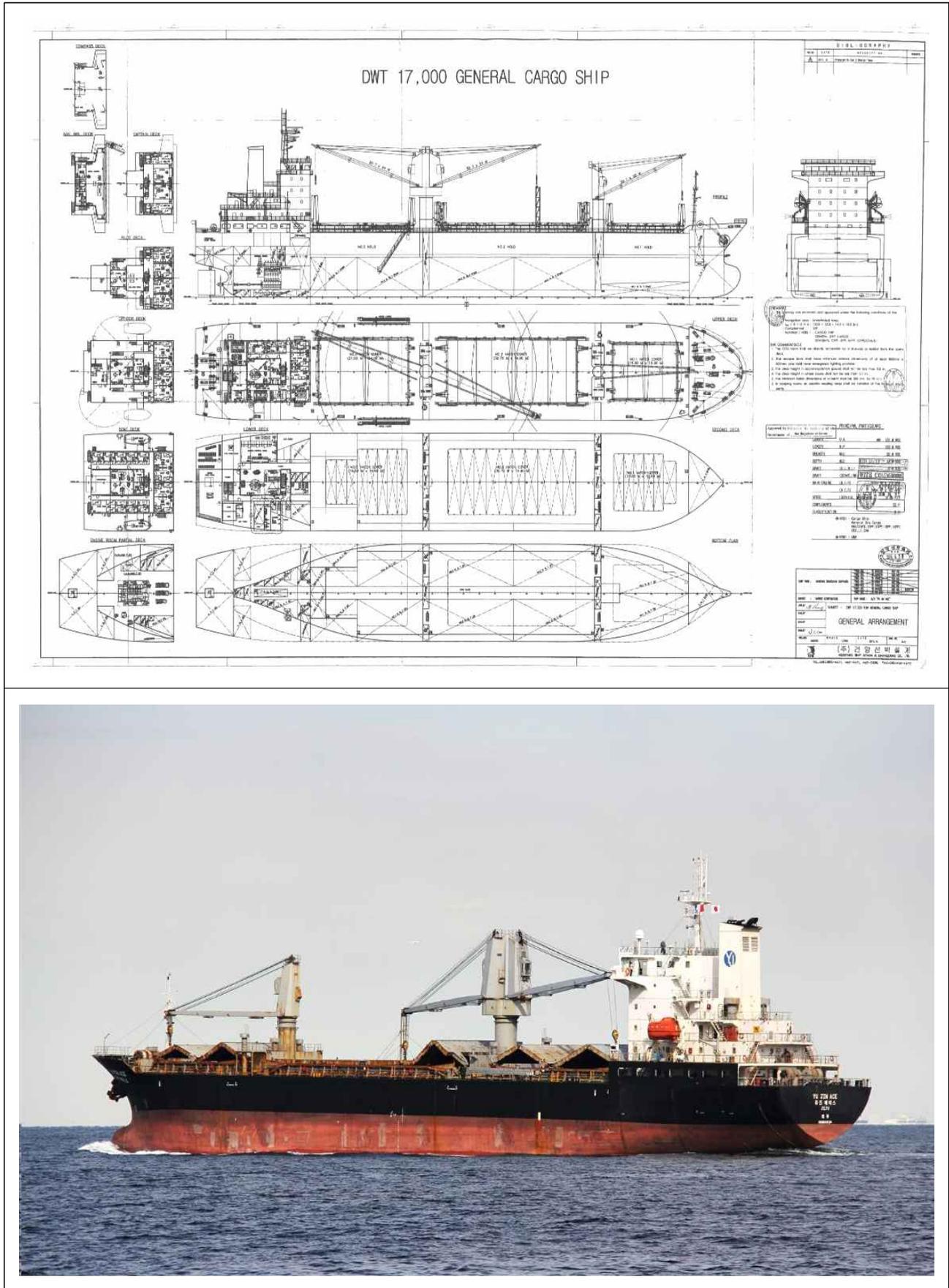
2. Factual Information

2.1 Ship Particulars

2.1.1 Principal particulars of Yujin ACE

Ship Name	YUJIN ACE
Flag State	Republic of Korea
Port of Registry	Jeju city
IMO No.	9585120
Ship Type	General Cargo Ship
Owner	Shin Han Capital Co., Ltd.
Safety Management Company	Panstar Shipping Co., Ltd.
Max. No. of Crew (Pers.)	23
Ship Builder	Tong Soon dockyard, Nantong, China
Date of Launch	Jun 12, 2010
Classification Society	Korean Register of Shipping (KR)
Gross Tonnage (t)	11,481
Deadweight Tonnage (t)	17,556
Length (m)	124.45 / 131.90
Beam (m)	22.00
Depth (m)	14.50
Main Engine	Diesel
Max. Output	3,640
Propeller	1(Screw assembled)
Rudder	1

2.1.2 The YUJIN ACE was built in Tong Soon dockyard, Nantong, China, and as a general cargo ship, its gross tonnage is 11,481 tons, length is 124.45 meters, width is 22.00 meters, and depth is 14.50 meters.



<Figure 1> The YUJIN ACE's General Arrangement and photo

2.2 Shipowner and Operation

- 2.2.1 The ship, which was launched on June 12, 2010, obtained South Korean nationality and operated with the name, the YUJIN ACE, and the nationality or name wasn't altered before the accident occurred.
- 2.2.2 The owner of the ship at that accident time was Shin Han Capital Co., Ltd. but practical sales and operation related business were conducted by YUJIN Shipping Co., Ltd.
- 2.2.3 This ship mainly sailed in Northeast and Southeast Asia; Korea(Masan Port and Pohang Port), China(Shanghai Port), Indonesia(Jakarta Port), Malaysia(Port Klang), and Taiwan(Kaohsiung Port), transporting merchandise such as Hot Rolled Coil.

2.3 Ship Survey and Safety Management

- 2.3.1 After being built, the YUJIN ACE was registered in the Korean Register Shipping Inc, and at the accident time, the ship had a Ship Survey Certificate¹⁾ valid until August 30, 2020.
- 2.3.2 Panstar Shipping Co. Ltd., was a safety manager of the ship, had responsibility of the maintenance and repair of YUJIN ACE and of recruiting and managing crew to embark on the ship.

2.4 Crew Members

- 2.4.1 At the time of the accident, 19 crews were embarking on the YUJIN ACE. The captain and chief engineer were Korean and the rest of crews were 5 Vietnamese and 12 Indonesian.
- 2.4.2 The captain had careers about 12 years and 3 months. He embarked on the YUJIN ACE first time and the accident occurred 2 months after he embarked on the ship.

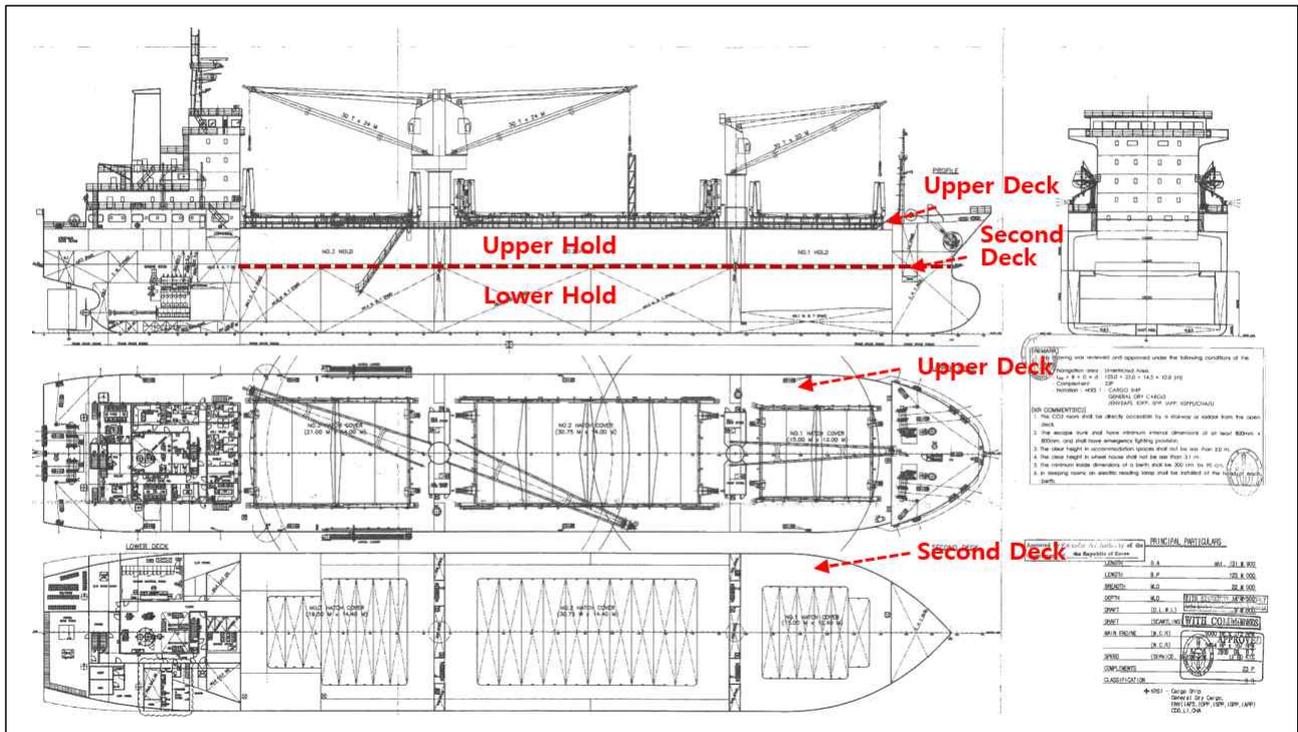
1) Cargo Ship Safety Construction Certificate(SC), Cargo Ship Safety Equipment Certificate(SE), Cargo Ship Safety Radio Certificate(SR), etc.

2.4.3 The deceased, as Indonesian Able seamen, had careers as Ordinary seaman or Able seaman on 3 general cargo ships in the past. He embarked on the YUJIN ACE as an Ordinary seaman(O/S) but was promoted to an Able seaman(AB), and the falling accident occurred²⁾ about 2 months(64 days) after he embarked on the ship.

2.5 Ship Structures

2.5.1 The ship named YUJIN ACE is designed as an AFT bridge vessel type. In front of the bridge, the cargo hold was arranged and the ship’s deadweight is 17,556 tons³⁾.

2.5.2 The ship has 3 cargo holds and each cargo hold is divided into upper and lower cargo hold in the from of a tween deck. The second deck is installed in the middle of the cargo hold to divide the upper and lower cargo hold. The floor of the cargo hold to the lower deck is about 7.4 meters high.



<Figure 2> Arrangement and Structure of holds

2) On April 25, 2019, he embarked on the cargo ship as a ordinary seaman(OS), was promoted to the Able seaman(AB), on June 14, 2019, and fell on June 27, 2019.

3) Deadweight tonnage(DWT) is a measure of how much weight a ship can carry.

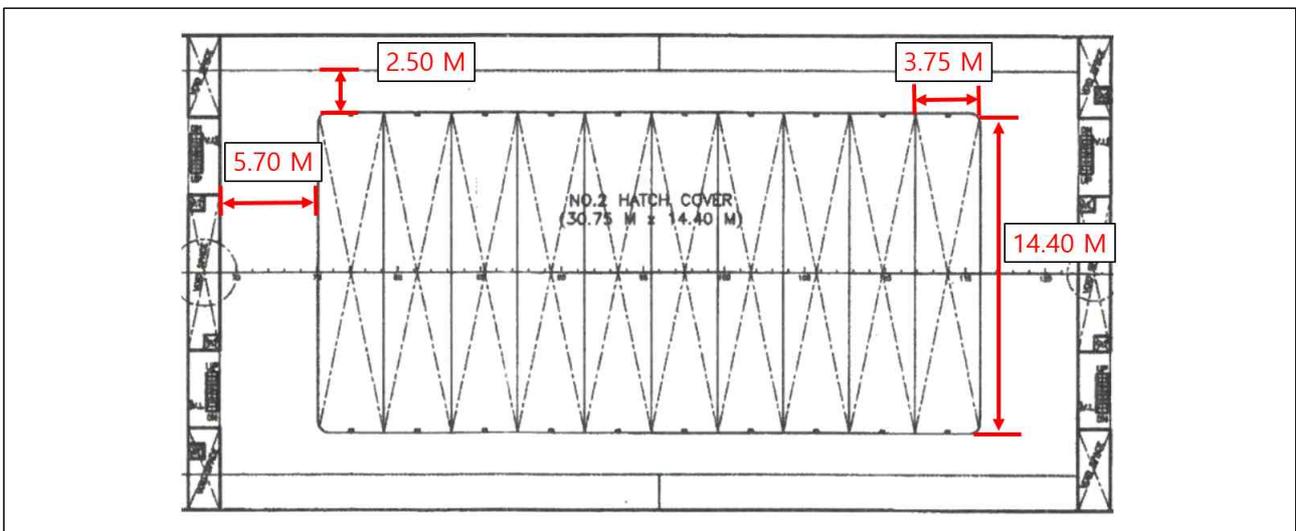
2.5.3 The hatch cover of the Upper deck is open and closes by folding type but the Hatch Cover of the Lower deck, which consists of several rectangle Pontoons, is a Pontoon type opening and closing by the ship's crane.



<Figure 3> The Hatch Cover of the Upper deck

2.5.4 No.2 hatch cover of the lower deck consists of 10 Pontoons. Because the No.2 cargo hold is placed in the middle of the ship in longitudinal direction, the shape is rectangular and each pontoon size is about 3.75 × about 14.40 meters.

2.5.5 The Hatch Cover lifted for cargo handling can be laid ashore, or stacked on forward (looking forward) or backward (looking after) of the lower deck in the Hatch Cover, in case only a part of the Hatch Cover pontoon is lifted. The No.2 cargo hold has about 5.7 meters wide where the Hatch Cover can be stacked, and when the pontoons are loaded, about 2 meters of the space is left enough for people to pass by.



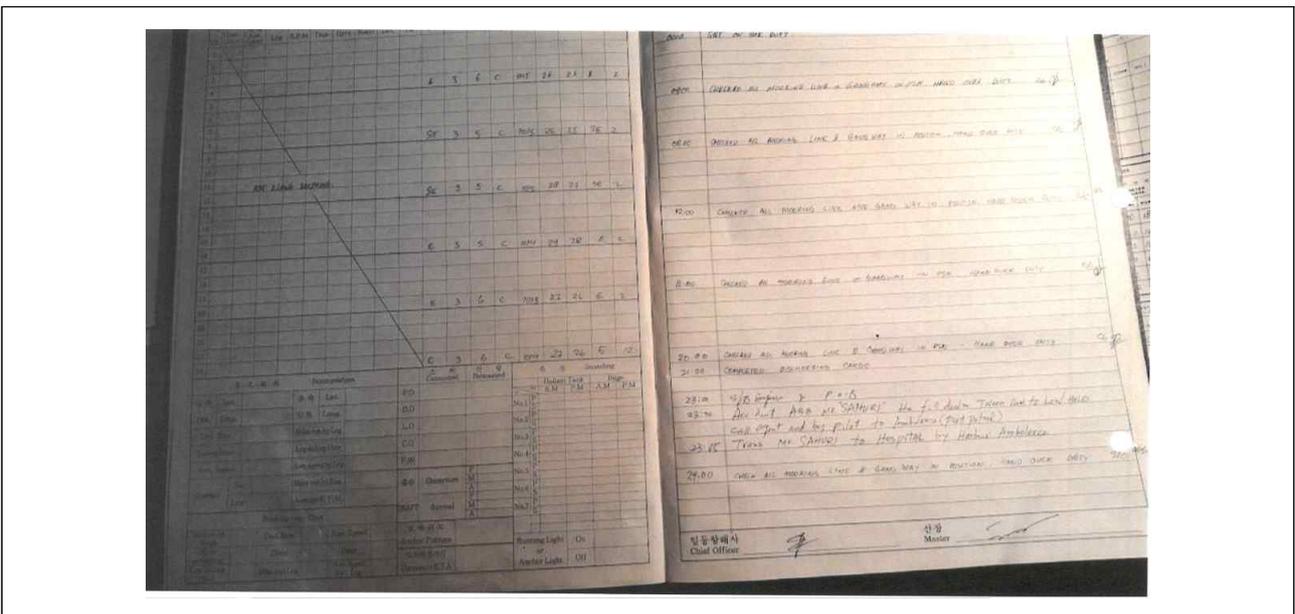
<Figure 4> Lower Deck Plan of No. 2 Hatch Cover (Normal Arrangement)



<Figure 5> The Hatch Cover looking up from Tank top

2.6 Wether Conditions

2.6.1 Based on the deck log book of the YUJIN ACE at the time of the accident, the east wind was blowing at about 3~5m/s, the weather condition was overcast, and the temperature was about 27 degrees Celsius.



<Figure 6> At the time of the accident, deck log book

section

3

Development of Accident

3. Development of Accident

3.1 Before an Accident

- 3.1.1 After departure of Cigading Port, the YUJIN ACE berthed at Port Klang in Malaysia, on June 27, 2019, around 14:00. Around 16:15, the ship commenced unloading the Hot Rolled Coil and completed the cargo work the following day, on June 28, around 21:00.
- 3.1.2 Around 23:00 on the same day, the pilot embarked on the ship for departure. Around 23:25, Dunnages used for lashing cargo removed from the cargo hold floor(tank top), and the closing of the pontoons for the No.2 hatch cover commenced at around 23:30 by ship crane.
- 3.1.3 At the time, there were 5 crews working on the deck. 2 crews of them, the Chief Officer and Boatswain were working on the upper deck and 3 crews of them, the Able seaman and Ordinary seamen A and B were working on the lower deck in the Hold.

3.2 Accident Occurring

- 3.2.1 At the time of the accident, the hatch covers in the lower deck of the No. 2 cargo Hold were stored in front and back, and 7 of 10 in total covered. Around 23:35, to cover the rest, the Hatch Covers were latched in a Hook, and crews stepped back to the marginal sides not to collide with the moving cover when the crane was lifting it.
- 3.2.2 At the time, the Ordinary seaman A standing on the lower deck in the cargo hold heard a loud sound of something falling and found the Able seaman working together fallen onto the Hold floor.

- 3.2.3 The Ordinary seaman A told loudly the fact that the Able seaman had fallen onto the floor to the Chief Officer and the Chief Officer reported the accident immediately with Transceiver to the Captain being about to departure on the bridge. And then, the captain called for the ambulance by calling to local shipping agency in Malaysia.
- 3.2.4 The day around 23:40, the crews moved the Able seaman into the upper deck and checked his low pulse and respiration. Around 23:45, the ambulance arrived at the site, the Able seaman died while being taken to the hospital, on June 29, around 00:13 in the ambulance.

section

4

Analysis

4. Analysis

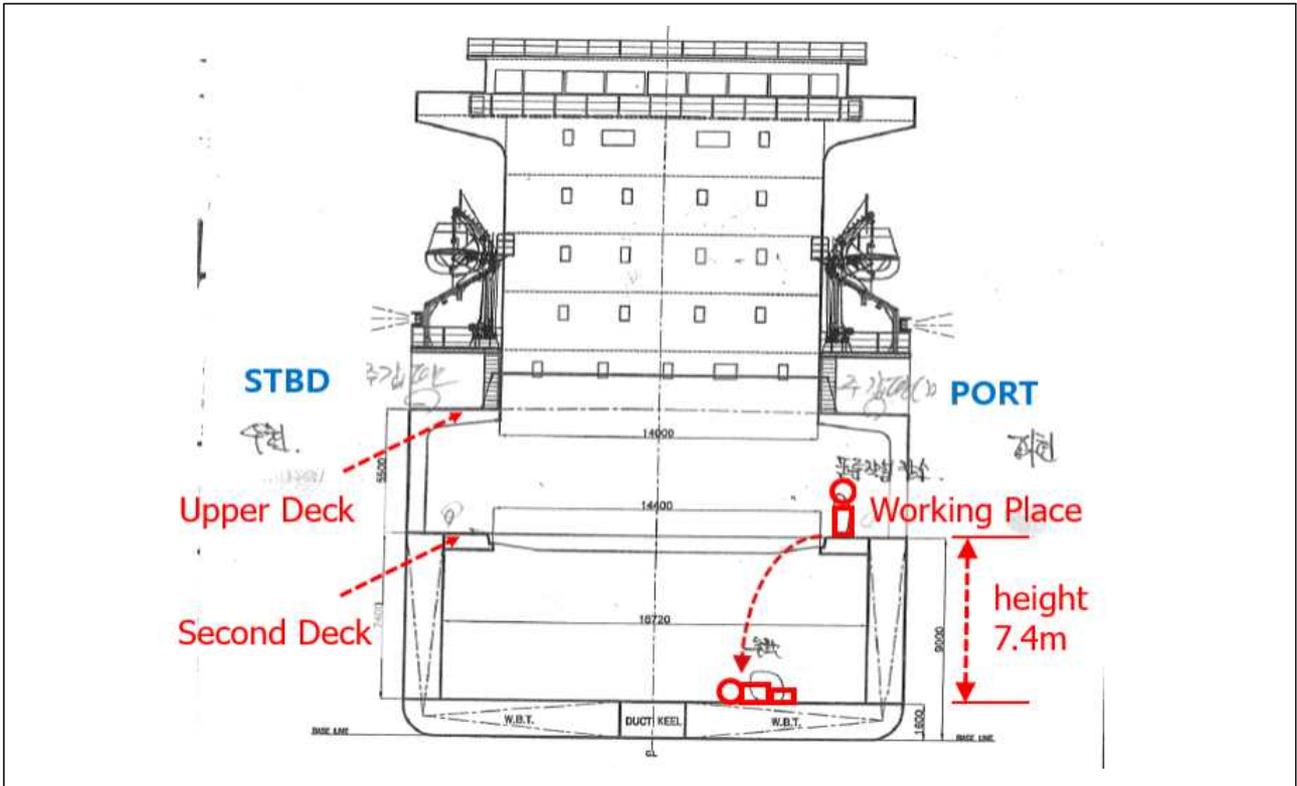
4.1 Cause of Death

- 4.1.1 No one witnessed directly the accident moment. The Ordinary seaman A was the first to find the accident. The Ordinary seaman A stated that he heard something falling, so turned his head in that direction to find the Able seaman fallen onto the cargo hold floor(tank top).
- 4.1.2 Also, the crew stated he suspected that the Able seaman fell onto the floor by stepping miss while moving after latching the hook on the Hatch Cover. Meanwhile, the accident report describes that the deceased crew fell while stepping back, given the circumstances.
- 4.1.3 The autopsy report Hospital T in Klang city, Selangor State, Malaysia of the doctor in Malaysia's local hospital describes that the direct cause of death of the deceased crew was 'serious head injury caused by a falling'.
- 4.1.4 Therefore, considering the crew's statement, the accident report, and the autopsy report comprehensively, the Able seaman seemed to have died by falling from the lower deck to the cargo hold floor(tank top), due to losing balance by stumbling or getting stuck on the floor⁴⁾, after completing the work of latching the hook to close the Hatch Cover.

4.2 Conform to Safety Regulations

- 4.2.1 The lower deck that the Able seaman was working on is placed between the upper deck and the cargo hold floor(tank top), and the lower deck is around 7.5 meters high from the cargo hold floor(tank top). So, If the cover is not closed, it is liable to fall in working without a cover because the deck structure is the parts except the outline have a hole.

4) There was no one witnessing the accident moment, so exact cause of the falling can't be determined.



<Figure 7> The work and falling site at the accident time

- 4.2.2 To assess and reduce this risk, the YUJIN ACE safety control procedures (safety rules on ship) assess the work safety, in the case of the work place is more than 2 meters high, according to the "Safety Checklist for working at heights" before the work, preparing and carrying out work according to the results.
- 4.2.3 However, from the captain's statement, it is judged that the Safety Checklists for working at heights were not filled in at the time of the accident, and safety measures about risks of unloading work were not taken accordingly.

4.3 Conform to Safety Regulations

- 4.3.1 At the time of the accident, the crews of the YUJIN ACE were working inside the cargo hold to departure. In accordance with the safety control procedures of the ship (cargo handling procedure), for crews to enter the cargo hold during unloading, a "Checklist for Permission to Enter the Cargo Hold during Working Cargo" must be filled in.

4.3.2 In accordance with the "Checklist for Permission to Enter the Cargo Hold during Working Cargo", workers entering the Hold should check and record ahead whether they are wearing personal protection equipment such as reflective vests, the 3rd worker monitoring safety except the worker entering the Hold is designated, and communication systems work well.

<Table 1> Checklists for the cargo hold entry permit

- | |
|--|
| <ul style="list-style-type: none"> ① Whether or not the work was reported to other workers including the supervisor unloading the inshore. ② Whether or not the information: details and starting time, were offered to the crew entering the hold and the director unloading the inshore. ③ Whether or not there is a safety sign on the entry of the cargo hold, the worker is wearing PPE or reflective vest, and a worker monitoring the safety keeps on the deck. ④ Whether or not proper lights were offered. ⑤ Whether or not there is a sign on the entry allowing the worker to enter the Hold while working cargo. ⑥ Whether or not the communication system was built among the enclosed area inside, the entry, and supervisors. ⑦ Whether or not the information of the entering plan was offered to officers in the bridge and engine room. ⑧ Whether or not on the Hold the designated worker keeps monitoring the safety of workers inside the Hold. ⑨ Whether or not over 2 workers enter the work area. |
|--|

4.3.3 However, at the time of the accident, the workers including the Able seaman were not offered⁵⁾ communication equipment such as Transceiver on the Hold, there was no the proper communicating way between workers inside and outside and the supervisor monitoring the safety of workers was not designated.⁶⁾

4.3.4 Also, this Checklist was not filled in before the work, and even though, as the Ship's Safety Officer, having known the fact that the crew was working inside the Hold on the day of the accident, the captain had not checked whether the Checklists had been filled in for the reason the work was urgent. Particularly, the captain usually verbally advised personal safety for unloading, but the Checklists used to be filled in⁷⁾ and approved after departure.

5) The crew working in the cargo hold at the time of the accident announced the accident loudly to others outside

6) The captain's statement

4.3.5 Therefore, it is judged that the YuJin ACE master, who has the overall supervisor of the ship’s safety, and the chief officer(C/O), who is responsible for cargo operation, lacked of supervision the measures for safety work in the cargo hold.

Checklist for cargo hold entry permit during cargo operation

1 / 3

This Permit must be issued in duplicate before entry of crew into any cargo hold during cargo operations. The original of Permit must be posted at a conspicuous place in the entrance to the space concerned, and the duplicate kept by the Chief Officer for future reference at the Ship's Office.

Ensure that one (1) form is used for one (1) cargo hold. Multiple cargo holds entries are not permit in one entry permit

Vessel :	Time and date for accessing cargo hold
Location :	Permit valid from :
Reason for entry :	To :

SECTION ONE	PRE-ENTRY PREPARATIONS (To be checked by Master of responsible Officer)	YES/NO
1.1	Has the work reported to the Foreman of Cargo Supervisor, Agent or other person concerned?	<input type="checkbox"/> / <input type="checkbox"/>
1.2	Have the details of work and commencement time of work informed to the Foreman and the crew who will enter into the cargo hold ?	<input type="checkbox"/> / <input type="checkbox"/>
1.3	Has the following item been discussed with crew who will enter into the cargo holds?	<input type="checkbox"/> / <input type="checkbox"/>
	a) Display the safety sign near the access hatches	
	b) Wear the Personnel Protective Equipment and reflector vest.	
	c) Designated person should be stationed on deck at all time to monitor the safety	
1.4	Is adequate lighting provided ?	<input type="checkbox"/> / <input type="checkbox"/>
1.5	Is the "Cargo Hold Entry Permit during cargo operations" posted at the entrance to the space?	<input type="checkbox"/> / <input type="checkbox"/>
1.6	Has a 3 way system of communications been established between enclosed space, person at entrance and Officer of the Watch?	<input type="checkbox"/> / <input type="checkbox"/>
1.7	Has the Officer of Watch(on Bridge, in the engine room of cargo control room) been informed of the entry planned?	<input type="checkbox"/> / <input type="checkbox"/>
1.8	Is a designated person stationed on deck above the cargo hold at all time to monitor the safety of people working in the cargo hold?	<input type="checkbox"/> / <input type="checkbox"/>
1.9	Are the two of more people to do the work inside the space?	<input type="checkbox"/> / <input type="checkbox"/>

PS-169 / 2014.03.01 PANSTAR SHIPPING

Checklist for cargo hold entry permit during cargo operation

2 / 3

SPECIAL INSTRUCTIONS :

I HAVE READ THE ABOVE PERMIT AND INSTRUCTIONS :

_____ Signature / Title or Rank	_____ Signature / Title or Rank
_____ Signature / Title or Rank	_____ Signature / Title or Rank
_____ Signature / Title or Rank	_____ Signature / Title or Rank

_____ Signature of Officer in charge	_____ Signature of Terminal Representative	_____ Signature of Master
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PS-169 / 2014.03.01 PANSTAR SHIPPING

<Figure 8> Checklists for cargo hold entry permit during cargo operation of the YUJIN ACE (form)

7) The captain stated that they usually filled the checklists not before working but after finishing the work to get the permit by the captain, and even on the day of the accident, the checklists weren't filled for the time is tight for unloading and sailing out, but oral training was given to the crews gathering on the deck instead.

section

5

Conclusions

5. Conclusions

- 5.1 The accident occurred when the Able seaman of the YUJIN ACE fell onto the lower deck, after latching the hook hanging in the crane with the Hatch Cover and moving, in the process covering the Hatch Cover to prepare departure after unloading.
- 5.2 No one witnessed the moment the Able seaman was falling onto the floor, and the direct cause of the fall is unknown, but while avoiding the cover for afraid of colliding into it in the process of lifting it, the Able seaman seemed to have fallen due to losing balance by stumbling or getting stuck on the floor.
- 5.3 It is judged that this accident occurred for the Able seaman's mistake but that the fact is also part of the cause of the accident that the captain, as a ship safety officer, and the chief officer authorized as in charge of cargo operation, didn't thoroughly check the safety before starting to work in the high place work and inside Hold.

section

6

Lessons

6. Lessons

- 6.1 The Chief Officer should assess ahead the risk and safety of 'working at height' or 'Entering the Cargo Hold during Unloading Work' before starting to work, and train ahead thoroughly to the whole working crews about the way and potential hazards of the work. Also, the captain should conduct to continuous training and education so that the crews must thoroughly conform to safety procedures.
- 6.2 The crews undertaking the work with potential fall hazards should be cautious and alert in working as even a minor mistake can lead to fatal accident. Also, the captain, the Chief Officer, should designate and place the supervisor leading and monitoring the work situation.

표 목차

<Table 1> Checklists for the cargo hold entry permit	21
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그림 목차

<Figure 1> The YUJIN ACE's General Arrangement and photo	8
<Figure 2> Arrangement and Structure of holds	10
<Figure 3> The Hatch Cover of the Upper deck	11
<Figure 4> Lower Deck Plan of No. 2 Hatch Cover (Normal Arrangement)	11
<Figure 5> The Hatch Cover looking up from Tank top	12
<Figure 6> At the time of the accident, deck log book	12
<Figure 7> The work and falling site at the accident time	20
<Figure 8> Checklists for cargo hold entry permit during cargo operation of the YUJIN ACE (form)	22



Ministry of Oceans and Fisheries

Korea Maritime Safety Tribunal