



**KOMITE NASIONAL KESELAMATAN TRANSPORTASI  
REPUBLIC OF INDONESIA**

**FINAL**  
**KNKT.16.04.03.03**

**Marine Safety Investigation Report**

**Fatality onboard Bahamian Registered Bulk Carrier GLOVIS MAPLE**

**IMO number: 9607019**

**At Taboneo anchorage, South Kalimantan**

**Republic of Indonesia**

**4 April 2016**



**2018**



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1. Indonesia Shipping Act no 17 year 2008, chapter 256 and 257 along with it explanatory
2. Indonesia Government Regulation No 62 year 2013 on Transport Accident Investigation
3. President Regulation No 02 Year 2012 on the Komite Nasional Keselamatan Transportasi
4. IMO Resolution MSC.255 (84) on Casualty Investigation Code

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Jakarta, 2018  
Chairman of  
KOMITE NASIONAL  
KESELAMATAN TRANSPORTASI

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The report is issued by the Komite Nasional Keselamatan Transportasi (KNKT), Perhubungan Building 3<sup>rd</sup> floor, Ministry of Transportation, Jln. Medan Merdeka Timur No. 5, Jakarta 10110, Indonesia, in 2018.

ISBN: -

**KOMITE NASIONAL KESELAMATAN TRANSPORTASI**

*Glovis Maple, Taboneo, Indonesia, 4 April 2016*

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**CONTENT**

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DISCLAIMER .....	i
CONTENT .....	iii
TABLE OF FIGURES .....	v
SUMMARY.....	vii
I. FACTUAL INFORMATION .....	1
I.1. PARTICULARS OF <i>GLOVIS MAPLE</i> .....	1
I.1.1. Ship Particulars .....	1
I.1.2. Voyage Particulars .....	2
I.2. DESCRIPTION OF RESCUE BOAT AND ITS DAVIT SYSTEM .....	3
I.2.1. Rescue Boat .....	3
I.2.2. Davit.....	4
I.2.3. Winch.....	5
I.2.4. Wire Rope .....	6
I.3. RESCUE BOAT CREW .....	6
I.4. ACCIDENT.....	6
I.4.1. Course of the accident.....	6
I.4.2. Rescue and recovery.....	10
I.5. POST-ACCIDENT EXAMINATIONS .....	13
I.5.1. Fall wire.....	13
I.5.2. Limit switches on the davit system .....	15
I.5.3. Service history .....	17
I.5.4. Rescue boat condition .....	17
I.5.5. Onboard maintenance.....	18
II. ANALYSIS .....	19
II.1. FAILURE MECHANISM.....	19
II.2. MAINTENANCE AND INSPECTION.....	21
III. CONCLUSION .....	23
IV. ACTION TAKEN .....	25
V. SAFETY RECOMMENDATIONS .....	27
V.1. THE SHIP OWNER.....	27
SOURCE OF INFORMATION .....	29

**KOMITE NASIONAL KESELAMATAN TRANSPORTASI**

*Glovis Maple, Taboneo, Indonesia, 4 April 2016*

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**TABLE OF FIGURES**

Figure I-1: Photo of ship	1
Figure I-2: Rescue boat location – Deck ‘A’ port side	2
Figure I-3: Taboneo anchorage, South Kalimantan, Indonesia	3
Figure I-4: Side view of the davit and boat	4
Figure I-5: Plan view	5
Figure I-6: Taboneo anchorage	7
Figure I-7: Crew boarded the boat in stowed position (picture taken by the ship’s crew)	8
Figure I-8: Rescue boat stowed location	9
Figure I-9: Rescue boat remained afloat after it fell down (picture taken by the ship’s crew)	9
Figure I-10: Rescue boat pulled to the port side (picture taken by the ship’s crew)	10
Figure I-11: Recovery of rescue boat (picture taken by the ship’s crew)	11
Figure I-12: Rescue boat hoisted by crane no.4 (picture taken by the ship’s crew)	11
Figure I-13: Davit system	13
Figure I-14: Davit marked with the last wire replacement	14
Figure I-15: The failed wire at the hook side (outboard)	15
Figure I-16: The failed wire at the winch side (inboard)	15
Figure I-17: Hoist limit switch	16
Figure I-18: Top sheave condition	16
Figure I-19: Rescue boat view from forward	17
Figure I-20: Cracks on starboard stern	18
Figure II-1: Limit switch counterweight eroded (picture taken from company investigation report)	19
Figure II-2: Condition of the counterweight hole (picture taken from company investigation report)	20
Figure II-3: Eye string entangled with the L-shaped pin (picture taken from company investigation report)	20
Figure II-4: Counterweight trapped against the top sheave (picture taken from company investigation report)	21

**KOMITE NASIONAL KESELAMATAN TRANSPORTASI**

*Glovis Maple, Taboneo, Indonesia, 4 April 2016*

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## SUMMARY

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On 4 April 2016, the Bahamian registered bulk carrier *Glovis Maple* anchored at Taboneo anchorage waiting for loading cargo sequence. The master was intended that the time spent to be used for practising manoeuvres with the rescue boat which at the same time it coincide with the abandon ship drill schedule.

The rescue boat was situated on the deck 'A' port side of the superstructure. At 1605<sup>1</sup>, the rescue boat was lowered into the water with the operating crew on board. Lead by the master accompanied with three crewmembers. They have driven the boat around the ship several times.

After satisfied, the rescue boat was brought back to the ship side where the boat crew re-connected forward painter line and fall wire hook. As the boat was being hoisted to its stowage position, at about 1630 suddenly the boat's fall wire parted and the boat fell down to the water surface from a height of approximately 13.5 metres and caused all four-boat crewmembers were seriously injured at the scene of the accident.

Afterward the rescue boat was pulled to alongside on the ship port side and hoisted by the ship's cargo crane No.4 then placed to the port upper deck of the ship. The master succumbed to his injury and three injured crew were taken to the hospital.

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<sup>1</sup> Unless stated otherwise, all times shown in this report are local (UTC + 8 hours)



## I. FACTUAL INFORMATION

### I.1. PARTICULARS OF *GLOVIS MAPLE*

#### I.1.1. Ship Particulars



*Figure I-1: Photo of ship*

Name of ship	:	<i>GLOVIS MAPLE</i>
Type of ship	:	Bulk Carrier
Flag	:	Bahamas
Port of registry	:	Nassau
IMO number	:	9607019
Call sign	:	C6ZS6
Date & place of built	:	6 March 2013, Hyundai Mipo Dockyard Co. Ltd Ulsan, South Korea
Classification society	:	Korean Registered of Shipping (KR)
Length overall (LOA)	:	187.88 m
LBP	:	182.5 m
Breadth moulded	:	32.26 m
Depth moulded	:	18.30 m
Draft (scant.)	:	12.85 m
Maximum height	:	49.88 m
Freeboard type	:	B
Gross tonnage	:	32545

# KOMITE NASIONAL KESELAMATAN TRANSPORTASI

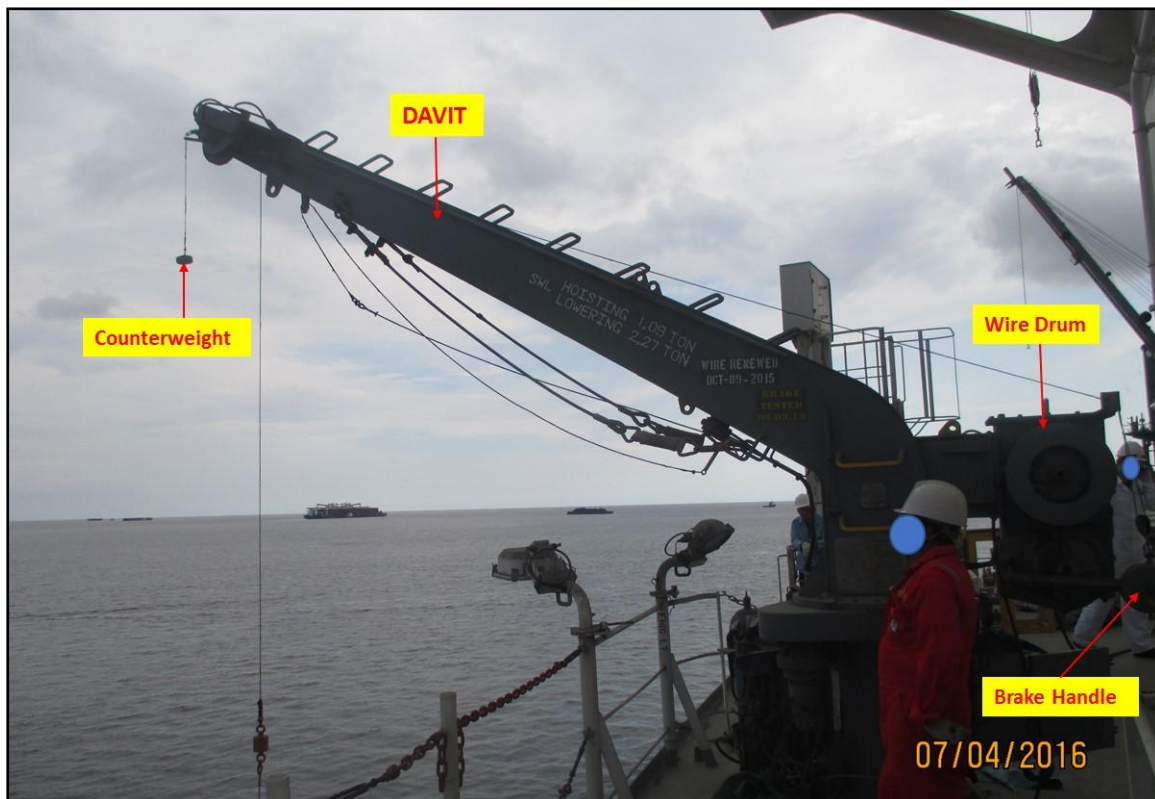
*Glovis Maple, Taboneo, Indonesia, 4 April 2016*

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Deadweight (summer)	:	55705
Main engine	:	Hyundai-B&W 6S50MC-C8 (Tier II)
Service speed	:	14.5 knots
Ship-owner	:	Maple Maritime Limited
Operator	:	Anglo-Eastern Ship Management
Number of crew	:	21

## I.1.2. Voyage Particulars

Port of departure	:	Singapore
Port of arrival	:	Taboneo, Indonesia
Type of voyage	:	International
Cargo information	:	In ballast
Manning	:	21
Number of passengers	:	0
Pilot on board	:	None
Draft at time of accident	:	F= 4.78 m and A= 6.88 m



*Figure I-2: Rescue boat location – Deck 'A' port side*

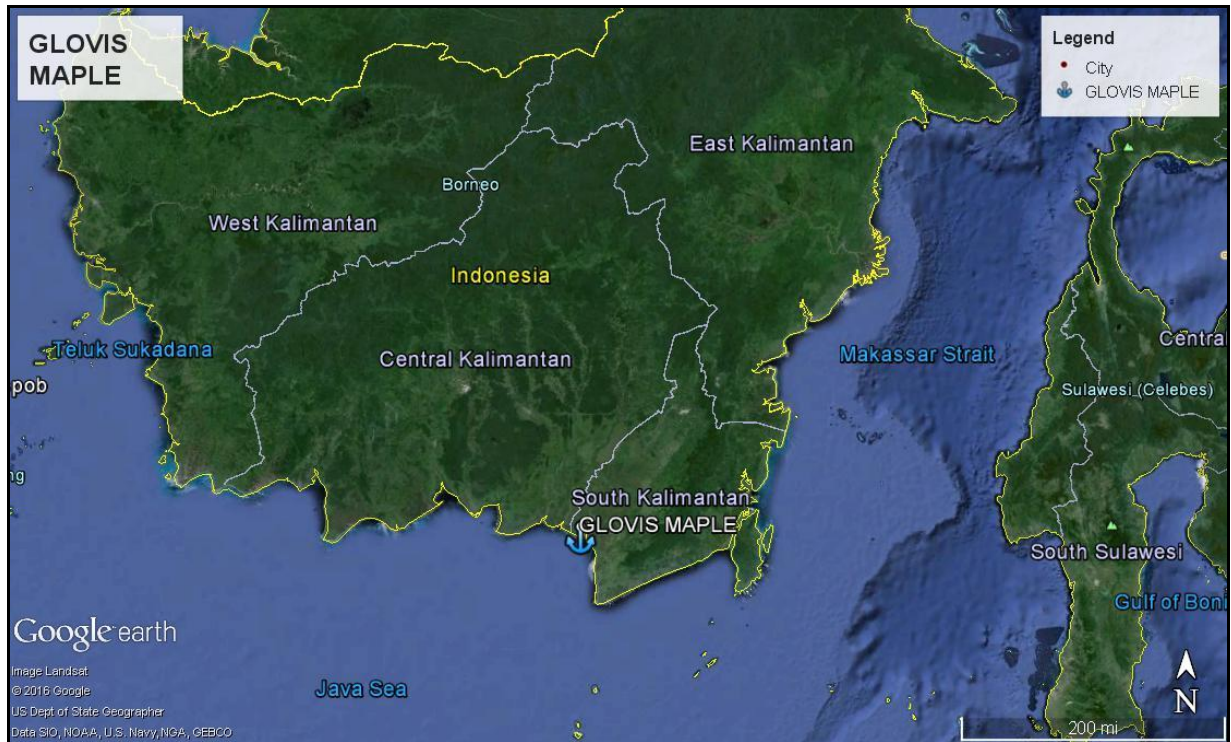


Figure I-3: Taboneo anchorage, South Kalimantan, Indonesia

## I.2. DESCRIPTION OF RESCUE BOAT AND ITS DAVIT SYSTEM

This data was taken from the layout drawing ‘Rescue Boat / Life Raft Handling Davit No. 52220F002’ dated 7 March 2013 and from the instruction manual which issued by the manufacturer.

### I.2.1. Rescue Boat

Manufacturer	:	Hyundai Lifeboats Co., Ltd
Type	:	HDR420
Dimension	:	4.2 m (L) x 1.75 m (B) x 0.78 m (D)
Serial number	:	HL 10-6-5849
Year manufacture	:	CT 2012
Number of persons	:	6
Type approval number	:	MED 0850275 / M2
Total weight	:	1065 Kg
Material of hull	:	Fiberglass Reinforced Plastic
Certificate number	:	HLB-DOC-HMD6125H
Approved of LSA code	:	CHAPT 5

The rescue boat is swing out and lowered by means of remote control that can be released and stopped the hand brake on the winch from inside the boat through a wire connection to the brake handle and a wire spool on the winch.

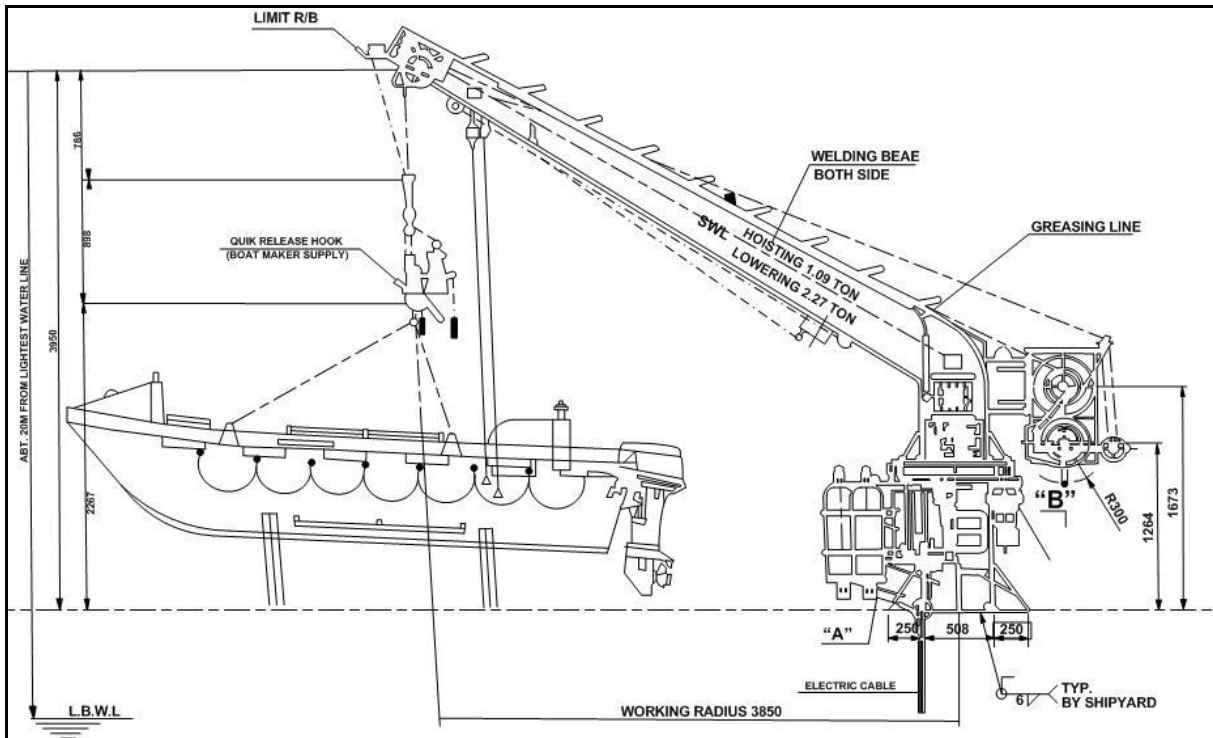


Figure I-4: Side view of the davit and boat

### I.2.2. Davit

Manufacturer	:	Dongnam Marine Crane Co., Ltd
Model	:	DSAD-22-E2H1
SWL	:	1090 / 2273 Kg
Static Load	:	2398 / 5000 Kg
Max. Inclination	:	20° Heel + 10° Trim
Working radius	:	3.85 m
MFG no	:	DN 12-07-13
Certificate number	:	MED-D-1569
Date	:	2012.07

The davit is a single arm slewing type. The boat is lowered and hoisted on a single fall wire.

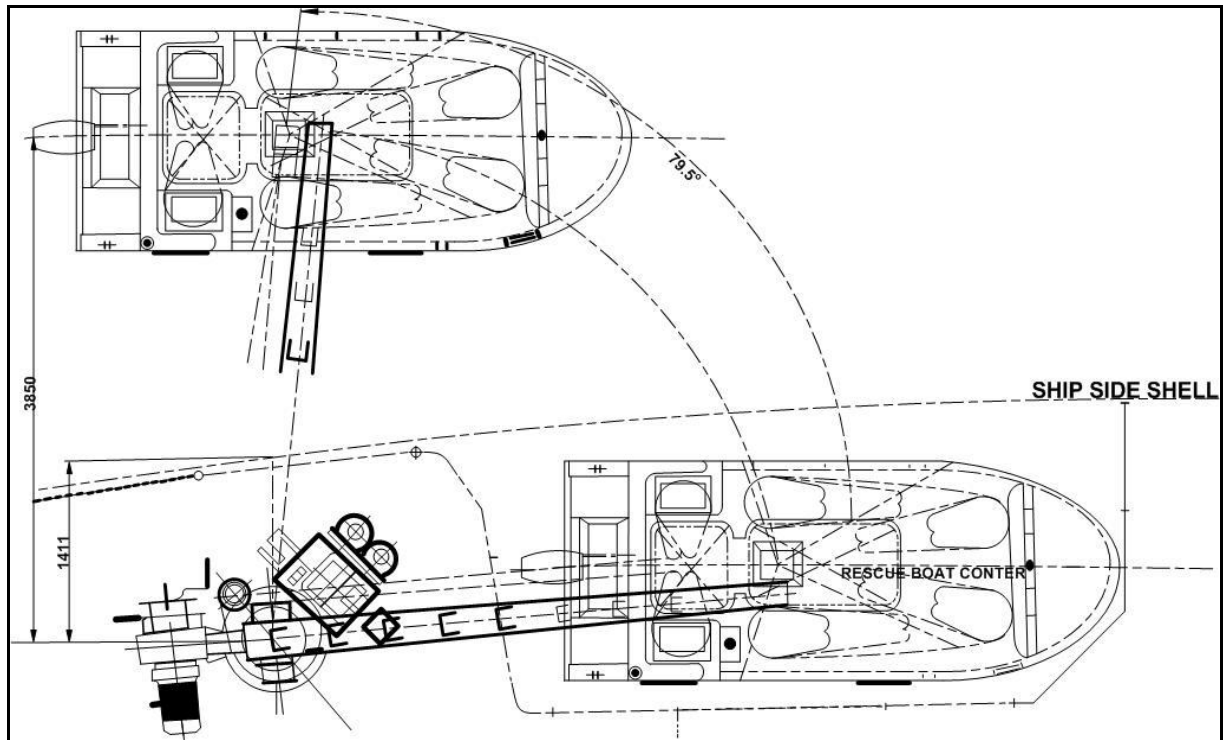


Figure I-5: Plan view

### I.2.3. Winch

Manufacturer	:	Dongnam Marine Crane Co., Ltd
Model	:	DSAD-01
SWL	:	1090 / 2273 Kg
Static load	:	1635 / 3409 Kg
Hoisting speed	:	18 m/min
Lowering speed	:	48 – 78 m/min
MFG no	:	DN 12-07-13
Certificate number	:	MED-D-1569
Elec. Motor for hoisting	:	3-Phase Squirrel Cage Induction Motor Starting method: Direct on line Insulation Class: F Protection: IP 56 Motor output: 5.5 kW x 6P
Elec. Motor for Slewing	:	3-Phase Squirrel Cage Induction Motor Starting Method: Direct on line Insulation Class: F Protection: IP 56 Motor output: 3.7 kW x 4P

#### **I.2.4. Wire Rope**

Manufacturer	:	Manho Rope & Wire Ltd
Nominal diameter of wire	:	Ø 14 mm
Number of strands	:	35
Number of wire per strand	:	7
Type of core	:	Independent Wire Strand Core (IWSC)
Length of wire	:	45 m
Specified breaking load	:	14.2 tonnes
Load at which sample brake	:	14.2 tonnes
Date of Test of Sample	:	31 March 2011
Date of certificate issued	:	23 November 2011

#### **I.3. RESCUE BOAT CREW**

The ship was manned with 21 multinational crewmembers. During the drill the rescue boat was manned by the following four crewmembers; master (P1), third engineer (P2), able seaman-2 (P3) and able seaman-3 (P4). As per role stated in the muster station the officer who supposed to be on the rescue boat was the chief officer. However, the master was taking over the chief officer role because he would like to take some photo of the ship by his own.

The master (P1) was Ukrainian, on 15 March 2016 he re-joined the *Glovis Maple* after took a leave as he previously worked on the same ship. He possessed Master Certificate issued by Ukrainian Administration in 2015.

The third engineer (P2) was Ukrainian. He joined the *Glovis Maple* on 18 October 2015 as his second contract with the company.

The able seaman-2 (P3) was Filipino. He joined the *Glovis Maple* on 17 January 2016. He has worked with the company since 2012.

The able seaman-3 (P4) was Filipino. He joined the ship on 3 March 2016 in Singapore. It was his second contract with the company.

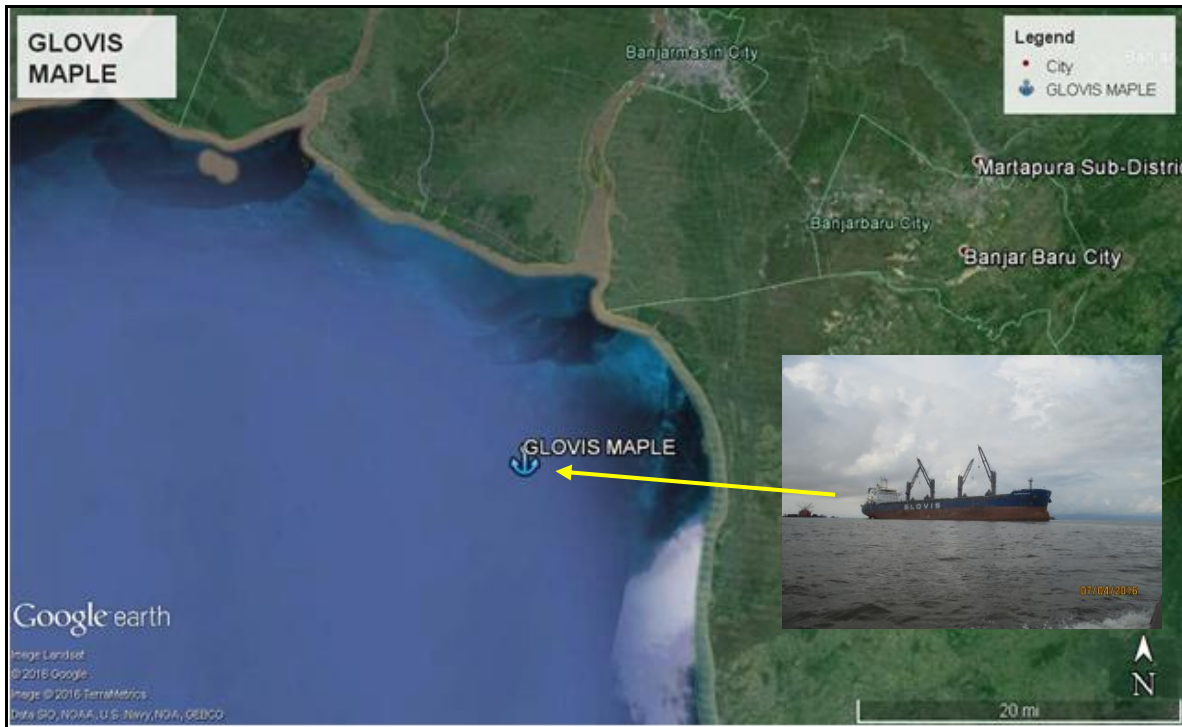
#### **I.4. ACCIDENT**

##### **I.4.1. Course of the accident**

On 31 March 2016, the Bahamian registered bulk carrier *Glovis Maple* arrived at Taboneo anchorage. At 0748 the ship dropped her starboard anchor with 9 shackles on deck in position 3° 41.3' S - 114° 26.3' E as scheduled to load coal.

On 4 April 2016, in her waiting time for loading sequence, the master intended to carry out practising manoeuvres with the rescue boat which at the same time it coincide with the abandon ship drill schedule.





**Figure I-6: Taboneo anchorage**

At 1530, the duty officer was given permission from Taboneo port control to launch the rescue boat. The rescue boat was situated on the deck 'A' port side of the superstructure. Weather conditions at the time (taken from the ship's log book) was generally good; wind from SW force 2, overcast sky, visibility 7, barometric pressure 1014mb, air temperature (dry/wet) 30/28°C and sea temperature 30°C.

At 1530, Lifeboat drill was carried out. At 1600, Lifeboat drill was completed afterward crew assembled for rescue boat drill.

At 1602, four crewmembers, as operating crew boarded the rescue boat in stowed position. They were wearing personnel protective equipment including lifejackets and hard hats. The person who in charge of the davit winch operation was the boatswain. The chief officer was monitoring the overall activity from the bridge.



*Figure I-7: Crew boarded the boat in stowed position (picture taken by the ship's crew)*

At 1605, the boatswain started to lower the manned rescue boat to water level under gravity by raising the winch brake handle.

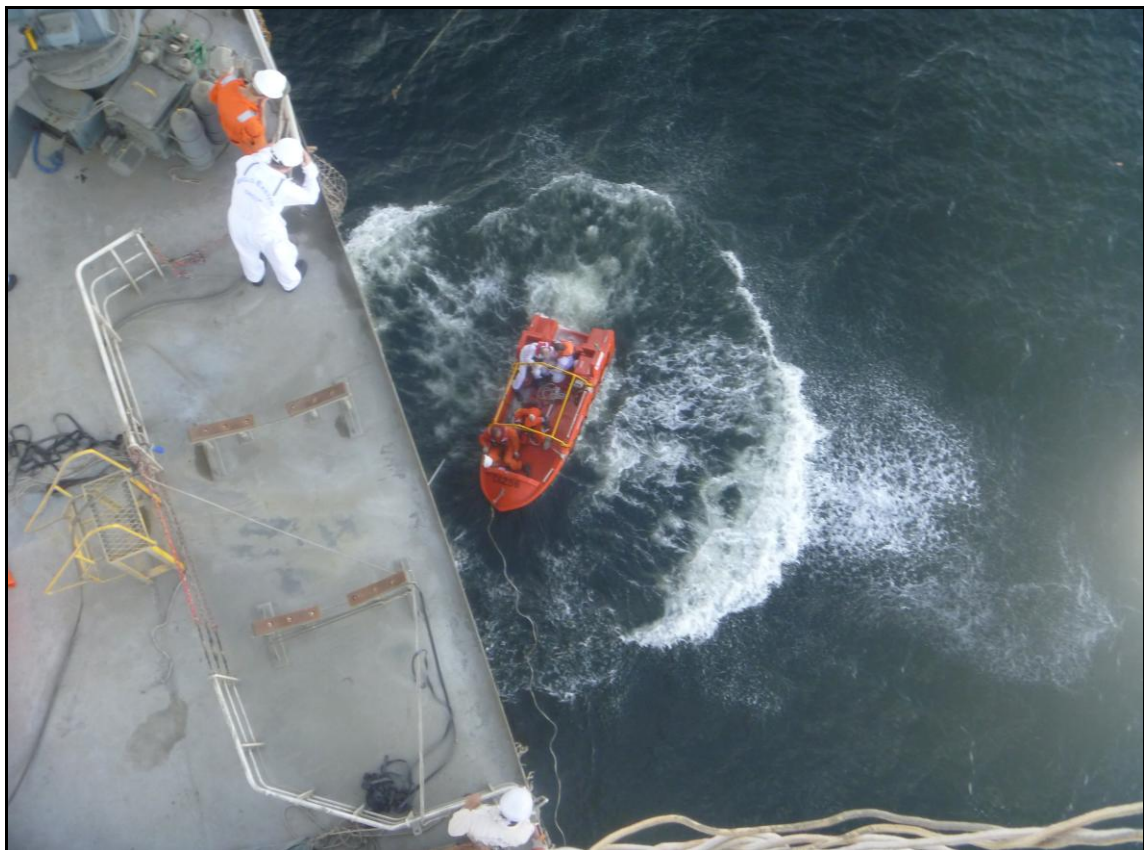
At 1610, the rescue boat was waterborne then the boat crew release the fall wire hook and cast off the forward painter. After free from the connection, the boat crew commenced manoeuvring and drove the rescue boat around the ship several times.

At 1625, the rescue boat alongside to the port side of the ship where the boat crew re-connected the forward painter and the fall wire hook. After got ready confirmation from the boat crew, at 1627 the boatswain started hoisting the manned rescue boat by pressing steadily the remote push button.

At 1630, while the rescue boat about to reach the deck 'A' level, the fall wire suddenly parted. The rescue boat fell down into the water from an estimated height of 13.5 metres; it slammed hard the water surface evenly. The rescue boat remained afloat and in upright position with four injured crew inside. Due to the hard impact the outboard engine was detached from its assembly place and sank.



*Figure I-8: Rescue boat stowed location*



*Figure I-9: Rescue boat remained afloat after it fell down (picture taken by the ship's crew)*

#### **I.4.2. Rescue and recovery**

At 1633, the chief officer informed Taboneo port control about the accident by VHF radio channel 74.

At 1640, the ship's agent was informed regarding the accident and medical assistance was requested as soon as possible.

At 1650, the company's technical superintendent was contacted via telephone and the accident reported.



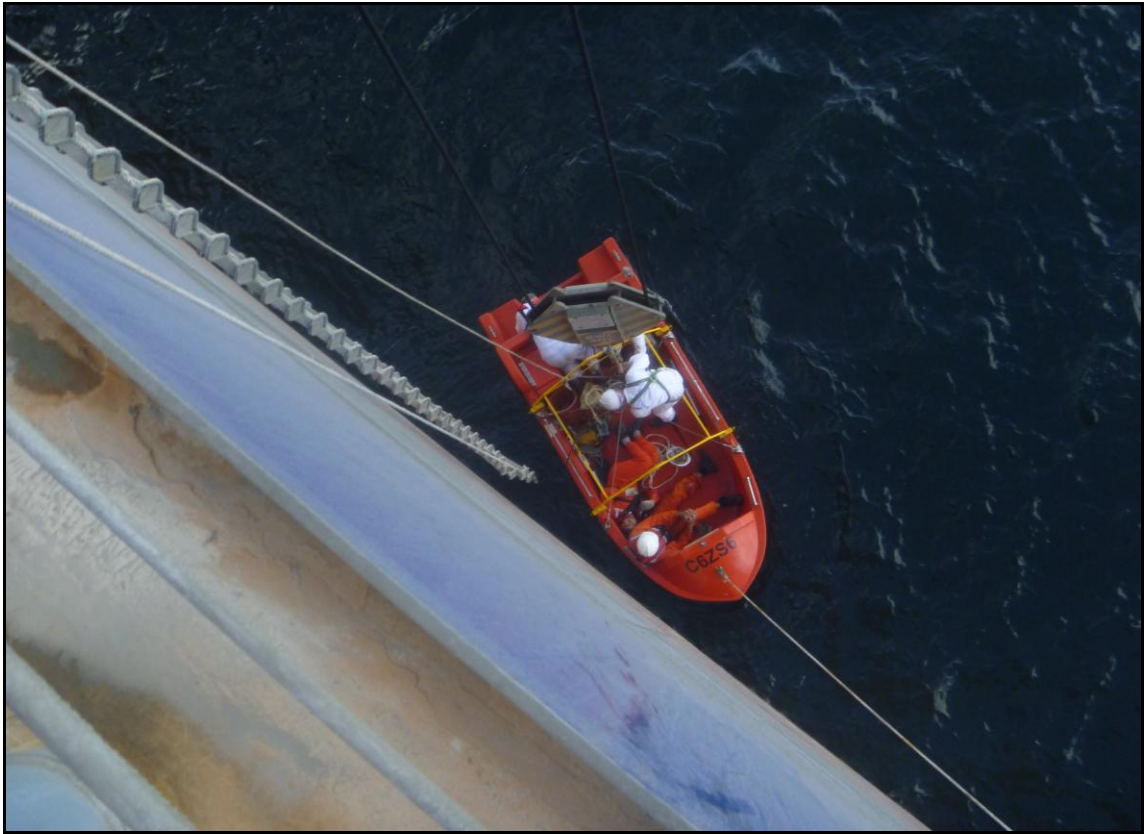
*Figure I-10: Rescue boat pulled to the port side (picture taken by the ship's crew)*

The rescue boat crew were unable to move due to injured. Only the third engineer could respond to verbal communication from deck. They could not get back to the ship without assistance. The rest of the ship's crewmembers were pulling the forward painter and brought the rescue boat alongside on the port side between cargo hold 4 and 5, where it reachable by cargo crane no. 4. Afterward the aluminium draft ladder was rigged up for the ship's crew access to the rescue boat.

At 1654, the third officer went down to the rescue boat. A visual inspection of securing points for hoisting was made and found no damages.

At 1658, the rescue boat was hoisted using the cargo crane no 4.

At 1700, the ship's crew was managed to bring the rescue boat onto the upper deck and provide medical assistance to the injured crew.



**Figure I-11: Recovery of rescue boat (picture taken by the ship's crew)**



**Figure I-12: Rescue boat hoisted by crane no.4 (picture taken by the ship's crew)**

## **KOMITE NASIONAL KESELAMATAN TRANSPORTASI**

*Glovis Maple, Taboneo, Indonesia, 4 April 2016*

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All injured crew were suffered broken legs. The able seaman-2 (P3) had a broken leg and a broken arm as well. Immediately each of the injured crew was given Ketorolac Tromethamine Injection 30 mg/ml to ease the pain by the second officer. This was an intramuscular injection for the short-term of pain management of acute severe pain.

At 1800, the master condition was getting worse and oxygen support was given right away. At 1818, the master unconscious and immediately carried out cardio pulmonary resuscitation. The Ephinephrine Injection (1 mg/ml) was administered intravenously and followed with a second Ephinephrine Injection about four minutes later. Meanwhile a cardio pulmonary resuscitation continually applied.

At 1905, the master was pronounced deceased after examined by the chief officer. There were no breathing, no any heartbeat, and eye pupils not react to the light.

At 2100, the port health duty officer received a report regarding the accident from the ship's agent. Immediately they preparing for two ambulances and medical equipment for evacuation purposes.

At around 2130, the port health officers together with the agent were launched to Taboneo anchorage.

At 2345, the port health officers and the agent arrived on board the ship.

The port health officers undertook an examination to the injured crewmembers and they came with the result as follows:

- The master (P1) confirmed was deceased. The vital signs checked found has no pulse, negative respiration rate and eye pupils' maximum wide open.
- The third engineer (P2) suffered close fracture ankle sinistra on his left leg.
- The able seaman-2 (P3) suffered close fracture tibia fibula sinistra on his left leg and close fracture radius ulna sinistra on his left arm.
- The able seaman-3 (P4) suffered open fracture tibia sinistra on his left leg.

Subsequently all injured crewmembers were transferred using cargo crane to the service boats and taken to the hospital. The deceased master was transported separately. The time required to travel from Taboneo anchorage to the quay side was about two hours.

## I.5. POST-ACCIDENT EXAMINATIONS

When KNKT arrived aboard the *Glovis Maple*, the davit system situated on the deck 'A' port side of the superstructure was found swung-in position and the rescue boat was placed on the port side upper deck. The parted fall wire which was connected to the load block was laid nearby. There was no damage found on the steel structure of the davit system or base.



**Figure I-13: Davit system**

### I.5.1. Fall wire

The fall wire was measured and found to have failed at about 6.15 metres from outboard end of the rescue boat. The failure point was approximately slight below the top sheave. The rescue boat had been installed when the ship was on the shipyard. Prior to the ship delivery, the shipyard had supplied a coil of wire rope for spare. Reportedly the spare wire rope came with the same diameter and specifications as the installed one.

After 30 months of service the initial fall wire had been replaced with the spare wire. The replacement was performed on 9 October 2015 as stencilled on the davit.



Figure I-14: Davit marked with the last wire replacement

From the installation period to the accident, the rescue boat davit was used three times as follows:

1. On 17 December 2015.

The ship's crew carried out Lifeboat drill in Lianyungang anchorage, China. The rescue boat was lowered and it was launched for manoeuvring test. The crew embarked to the rescue boat when the boat was on water and disembarked right before the rescue boat commenced to recovery.

2. On 13 February to 17 February 2016.

During internal audit the rescue boat davit was swung out in dead ship condition.

According to classification rules, *dead ship condition means a condition under which:*

- i) *The main propulsion plant, boiler and auxiliary machinery are not in operation due to the loss of the main source of electrical power, and*
- ii) *In restoring propulsion, the stored energy for starting the propulsion plant, the main source of electrical power and other essential auxiliary machinery is assumed to not be available.*

3. On 18 March 2016.

The ship's crew carried out liferaft launching simulation. A drum filled with 200 litres of water was used as payload.



The lubricant oil ‘Ceran AD Plus’ has been applied for wire maintenance even though was not included in the list of recommendation of lubrication oil as per manual book from the maker.

According to the fleet manager, the ship owner has decided that the whole parted fall wire will be removed from the ship and send to the third party for further analysis and test.



*Figure I-15: The failed wire at the hook side (outboard)*



*Figure I-16: The failed wire at the winch side (inboard)*

### **I.5.2. Limit switches on the davit system**

The davit system was equipped with a hoist limit switch and a slewing switch. The rescue boat hoist limit switch was intended to stop the winch motor just before the load block reaches the top sheave. The load block was connected to the quick release hook. It was reported that the limit switch was tested and in working condition. However, it was not tested prior to launch the rescue boat on that day.



**Figure I-17: Hoist limit switch**

The top sheave cheek plate show corroded and have slight dented. There was a spot of rust on the upper housing of the top sheave. It seems when the counterweight travel up it might touched the upper housing.



**Figure I-18: Top sheave condition**

### I.5.3. Service history

In accordance with the documentation available on board, the annual servicing for the free-fall lifeboat, the rescue boat and its launching appliances by the service company was conducted on 23 March 2014 in Xinshengyu Port, Nanjing, China.

The annual service for the rescue boat covered on the boat hull and appliances, boat engine, release gear, davit system and winch/hydraulic system. The result of inspection was stated 'Good' and none of parts were replaced or repaired.

Subsequently the annual servicing was conducted on 15 May 2015 in Hong Kong. The service company used the Hyundai Lifeboats checklist for the rescue boat hull, fitting, bilge system, electrics and used they own company checklist for rescue boat/liferafts winch and davit system. The result of inspection was 'Pass' and stated 'Good', and nothing of parts have been exchanged or repaired.

### I.5.4. Rescue boat condition

The rescue boat was laid up on the upper deck port side. It seems that there was no major damage due to impact on the rescue boat hull. There was line of cracks sighted on the boat starboard stern, however it was unsure whether the cracks due to impact or it already there beforehand.

The outboard motor was detached from its place and it sank. The bracket of four point bridle suspension system and fittings such as connecting shackles, bridle wires and master link were still in place.



Figure I-19: Rescue boat view from forward

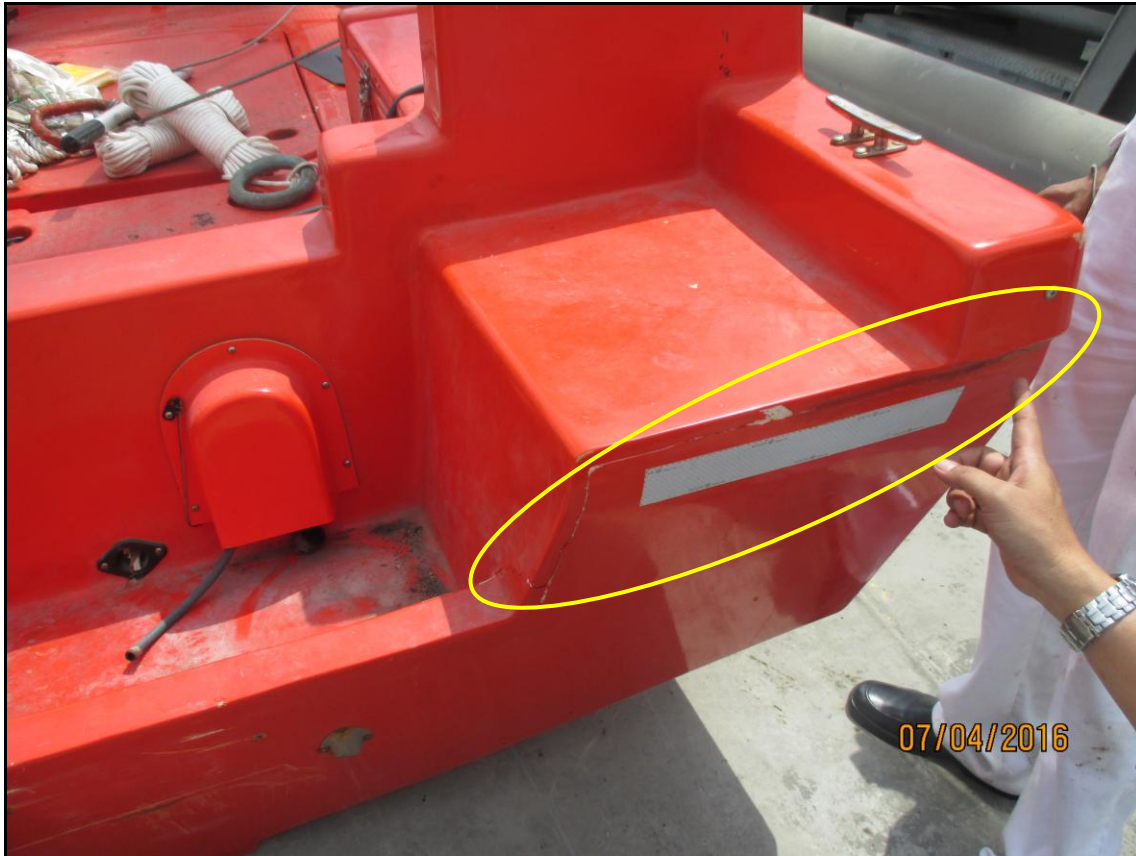


Figure I-20: Cracks on starboard stern

### I.5.5. Onboard maintenance

The ship has used the computerised Planned Maintenance System (PMS). In the PMS the rescue boat was determined as main equipment and categorized as routine maintenance.

The routine maintenance works were scheduled on weekly and monthly basis, as below:

- *Launching and Recovery Arrangements W; Work to be done: Readiness for Use.* It was scheduled to be inspected on weekly basis.
- *LMR 03 Launching and Recovery Arrangements 1M; Work to be done: LMR 03 Monthly Inspection Items: - Lifeboat gripes/Lashings, - Davit's span wire and Lifeline, - Lifeboat Davits and Winches foundation, - Davits greasing.* Those were scheduled to be carried out on monthly basis.

The third officer was assigned as a responsible person for this work.

## II. ANALYSIS

### II.1. FAILURE MECHANISM

The rescue boat was manned by four crewmembers and fell down to the water surface from a height of approximately 13.5 metres because the fall wire suddenly parted whilst the davit was hoisting the boat. The ship owner has appointed *TTI Testing Ltd* for assistance in determining the cause of a fall wire failure. The whole failed wire was sent to *TTI Testing Ltd* for inspection and testing. The results of the inspection of the whole length of fall wire indicated that it was in generally good condition, the lubricant was at a good level and in good condition throughout the construction. No corrosion was noted along the length of the fall wire. The result of two breaking load tests was 144.5 kN. The weight of the rescue boat and its crew at the time of accident (empty boat 570 kg plus 4 person x 90 kg= 360 kg) was approximately 930 kg (full boat weight 1090 kg), it was less than the breaking load required to part the fall wire.

In compliance with the ISM Code, the ship owner carried out their own investigation to investigate the accident. There was possibility the fall wire became trapped by the limit switch counterweight and then cut has been proposed by the ship owner QHSE superintendent. It was evident that the limit switch counterweight eroded on the outer edge which was fit in the groove of the top sheave and it showed deep marks of wire scratch on the hole. *TTI Testing Ltd* point out that the counterweight has evidence of high transverse loads scraping across the inside of the diameter 20 mm hole. The combination of abrasion, transverse loading and tension through the hole in the counterweight cut the outer layer of strands and progressively led to failure of the inner strands.

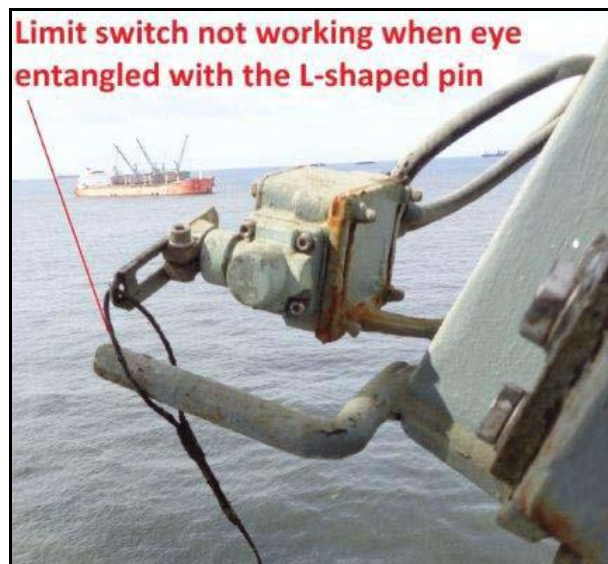


Figure II-1: Limit switch counterweight eroded (picture taken from company investigation report)



*Figure II-2: Condition of the counterweight hole (picture taken from company investigation report)*

The limit switch for automatic shutdown of the winch motor was not functioning. Even though it was uncertain but there was strong suspicion that the counterweight of the limit switch moved up along with the fall wire then it trapped against the top sheave. And a meanwhile the small wire which was attached to the counterweight without intention was looped over the L-shaped pin, it cause preventing the limit switch to become active.



*Figure II-3: Eye string entangled with the L-shaped pin (picture taken from company investigation report)*

Subsequently the fall wire was getting pinched in between the upper of sheave housing and the top sheave as the davit winch continued hoisting. It could have been produce an excessive strain to cut the fall wire.

The fall wire has been applied with lubricant oil 'Ceran AD Plus', it was not included in the list of recommendation of lubrication oil as per manual book from the maker. However, it appropriate for the purpose. The lubricant oil has a nature of good adhesion to metal and it

prone to be sticky if the equipment was not cleaned. It could be the reason of how the limit switch counterweight travel up along with the wire while heave in.



Figure II-4: Counterweight trapped against the top sheave (picture taken from company investigation report)

## II.2. MAINTENANCE AND INSPECTION

The ship make use of computerised Planned Maintenance System (PMS). The rescue boat routine maintenance was scheduled on monthly and weekly inspection. The responsible officer for this work was the third officer.

The IMO Maritime Safety Committee (MSC) Circular.1206/Revision.1 *Measures to prevent accidents with lifeboats* was published on 11 June 2009. In Annex 1, '11 Weekly and monthly, and routine maintenance as specified in the equipment maintenance manual(s), should be conducted under direct supervision of a senior ship's officer in accordance with the maintenance manual(s)'.

When doing inspection, effective visual inspection is dependent on the inspector's powers of concentration. It is needed the senior rank officer to supervised the junior officer works.

The limit switch supposed to be tested before the boat launched but is not done. The rescue boat is lowering together with four crewmembers inside which they have already embark

## KOMITE NASIONAL KESELAMATAN TRANSPORTASI

*Glovis Maple, Taboneo, Indonesia, 4 April 2016*

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when the rescue boat sitting on the cradle. There is no procedure on the ship sighted to prohibit lowering manned rescue boat.

Refer to the MSC Circular.1206/Revision.1, *2.3.9 all tests required for the design and approval of life-saving appliances are conducted rigorously, in order to identify and rectify any design faults at an early stage;*

In Annex 2, *Guidelines on safety during abandon ship drills using lifeboats* includes:

*2.3.2 When performing drills with persons on board a lifeboat, it is recommended that the boat first be lowered and recovered without persons on board to ascertain that the arrangement functions correctly. The boat should then be lowered into the water with only the number of persons on board necessary to operate the boat.*

It is prudent to adopt this guideline into the ship's procedure to prevent an accident from the same contributing factors.



### **III. CONCLUSION**

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Lowering and hoisting the manned rescue boat when performing a drill can be a potential risk. The limit switch counterweight was unconsciously able to move up along with the fall wire then it trapped against the top sheave. The fall wire was getting pinched in between the upper housing and the top sheave. This condition was a contributing factor for the accident. The failure was facilitated by non-functioning limit switch on the davit system.

The accident would not have been possible if the periodic inspection of the entire system was maintained and carried out in accordance with the procedures, as the defect would have been noticed and remedied in early stage.

**KOMITE NASIONAL KESELAMATAN TRANSPORTASI**

*Glovis Maple, Taboneo, Indonesia, 4 April 2016*

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## **IV. ACTION TAKEN**

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The ship owner has:

- Instructed the master, to eliminate the possibility of small eye wire attached to the counterweight getting entangled with the L-shaped pin by reducing the length of the eye wire to less than 1 cm.
- Instructed the master, to ensure that the rescue boat is always lowered till about two metres above the water level and recovered before allowing people in the boat. The limit switches to be tested before being operated.
- Instructed the master, people to embark and disembark the rescue boat using the embarkation ladder.
- Instructed the Technical / QA department, all ships must lower and recover the boat without persons to ascertain that the arrangement functions correctly. To share the outcome of the investigation with all vessels and training centers. To approach the maker to supply later design davit head sheave protection and later design limit switch weight.
- Instructed the Technical department, to change design of limit switch to protected plunger design.
- Instructed the Technical department, ensure all vessels have limit switch warning notice posted both sides of davit.
- Instructed to Technical department, weekly inspection/tests of davit to be carried out and job listed in the Planned Maintenance System (PMS).

**KOMITE NASIONAL KESELAMATAN TRANSPORTASI**

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## **V. SAFETY RECOMMENDATIONS**

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The following safety recommendations shall in no case create a presumption of blame or liability.

### **V.1. THE SHIP OWNER**

- The KNKT recommends that the ship owner to consider enhance the senior officer role in supervise the junior officer works of maintaining the Lifeboats and Rescue boat Davits in the Planned Maintenance System.
- Furthermore it is prudent could adopt the guidelines from the MSC Circular.1206/Revision.1 to the ship procedures when performing drills with persons on board the boat.
- The KNKT recommends that the master to lower and raise the unmanned rescue boat to ensure that the boat arrangement are functions correctly before allowing operating crewmembers boarded the boat.
- Always test the function of davit limit switch prior to launch the rescue boat.

**KOMITE NASIONAL KESELAMATAN TRANSPORTASI**

*Glovis Maple, Taboneo, Indonesia, 4 April 2016*

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## **SOURCE OF INFORMATION**

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Crews of *Glovis Maple*;

Banjarmasin Port Administration Office;

Safety of Life at Sea, 1974 (SOLAS); LSA Code

TTI Testing Ltd; Rescue boat hoist wire failure

IMO Resolution MSC.255 (84) Code For The Investigation Of Marine Casualties And Incidents;

Investigation Report, Anglo-Eastern Group.