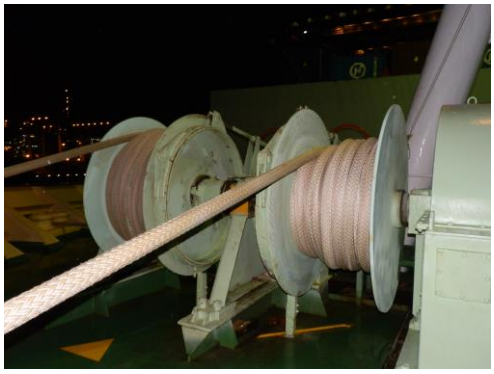
HELLENIC REPUBLIC

HBMCI
Hellenic Bureau for Marine Casualties Investigation

HELLENIC BUREAU FOR MARINE CASUALTIES' INVESTIGATION

MARINE CASUALTY SAFETY INVESTIGATION REPORT 18/2013

DEATH OF SEAFARER ON BOARD C/V EVER URBAN



October 2019

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Foreword

The Hellenic Bureau for Marine Casualties Investigations (HBMCI) was established by Law 4033/2011 (Government Gazette 264/12.22.2011), in the context of implementing EU Directive 2009/18/EC. HBMCI conducts technical investigations into marine casualties or marine incidents with the sole objective to identify and to ascertain through respective analysis, the circumstances and contributing factors that led to them and to draw useful conclusions and lessons learned that may lead, if necessary, to safety recommendations addressed to parties involved or stakeholders interested in the marine casualty, aiming to prevent similar future marine accidents.

The conduct of Safety Investigations into marine casualties or incidents is independent from criminal, discipline, administrative or civil proceedings whose purpose is to apportion blame or determine liability. This investigation report has been produced without taking under consideration any administrative, disciplinary, judicial (civil or criminal) proceedings and with no litigation in mind. It does not constitute legal advice in any way and should not be construed as such. It seeks to understand the sequence of events which occurred on the 26th of December 2013 and resulted in the examined very serious marine casualty. Fragmentary or partial use of the contents of this report, for other purposes than those produced may lead to misleading conclusions. The investigation report has been prepared in accordance with the format of Annex I of respective Law (Directive 2009/18/EC) and all times quoted are vessel's time unless otherwise stated as Local Time (UTC +2).

Under the above framework HBMCI has been examining the death of a seafarer on board C/V Ever Urban, which occurred on the 26th of December 2013, at the sea area of the Southern Ionian Sea, in Greece. This report is mainly based on information and evidence that have been derived mostly from the interviewing process and the information gathered during the HBMCI's visit on the ship.

Glossary of possible Abbreviations and Acronyms		
1	AB	Able seaman
2	AIS	Automatic identification system
3	Bf	Force of wind in Beaufort scale
4	CoC	Certificate of Competency
5	C/O	Chief Officer
6	DOC	Document of Compliance
7	GMDSS	Global maritime distress and safety system
8	GPS	Global positioning system
9	gt	gross tonnage
10	HCG	Hellenic Coast Guard
11	IMO	International Maritime Organization
12	ISM	International Management Code for the safe operation of ships and for pollution prevention
13	knots	unit of speed equal to one nautical mile (1.852 km) per hour
14	KW	Kilowatt
15	LT	local time
16	nm	nautical miles
17	2/O	2nd Officer
18	°	degrees
19	O(s)OW	Officer(s) on the watch
20	O/S	Ordinary Seaman
21	PPE	Personal protection equipment
22	PS	Pferdestärke (metric horsepower unit)
23	SMC	Safety management certificate
24	SMS	Safety management system
25	SOLAS	Convention for the Safety of Life at Sea 1974, as amended
26	STCW	International Convention on Standards of Training, Certification and Watchkeeping for seafarers
27	UTC	Universal co-ordinated time
28	VDR	Voyage Data Recorder
29	VHF	Very high frequency (radio)

1. Executive Summary

On the 24th of December 2013 "Ever Urban" departed from the port Rijeka (Croatia) and was en route to Piraeus Port. The vessel was loaded with containers and had a crew complement of 21 seafarers on board.

On the 26th of December at approximately 08:00 the Bosun and three members of the deck department were assigned by the C/O to replace the 'eye splice' of a mooring rope that was found damaged after the mooring operations at the last port.

By 08:30 the Bosun and the participating crew members were at the forecastle engaged with the task. Having prepared the new "eye" they proceeded with the tensioning of the new splice and the testing of its endurance by placing it on a bollard located aft of the starboard mooring winch through the forward starboard fairlead in order to gradually pull the rope and tighten its spliced eye.

At approximately 10:00 during the referred operation, the rope parted at the splicing point, snapped back and struck an AB on his left leg; the A/B was standing close to the bollard, inside the snapback zone.

The AB suffered a fracture on his left leg and was transferred by the crew to ship's hospital on a stretcher for first-aid treatment.

At 10:24 the Master reported the incident to the company. Although first-aid and treatment was provided by an officer of the crew, the condition of the A/B deteriorated and at 11:45 the Master contacted Piraeus Joint Rescue Coordination Center (JRCC Piraeus) and reported the injury and the condition of the AB requesting his medical evacuation and transfer to a shore hospital.

At 12:10 JRCC Piraeus instructed the Master to change the vessel's course towards Katakolo port (mainland port at west Peloponnese, Greece). At 13:27 the Company's doctor send an e-mail with medical advice and medication on the treatment of the injured A/B and instructed to send him to shore as soon as possible for surgical care.

At 14:43 EVER URBAN and HCG SAR boat 516 had arrived at the prearranged meeting position but due to prevailing rough sea condition the MEDEVAC could not be safely completed. Following the Master requested for a helicopter transfer however it was agreed to deploy a tug boat from Katakolo port.

At approximately 17:00 the AB medical condition deteriorated and the First Aid Officer administered artificial respiration and CPR in order to preserve his vital functions.

At approximately 17:15 the tug boat approached EVER URBAN and at 17:20 the injured AB was transferred on the tug boat by the ship's crane.

However, at 17:25 the tug Skipper communicated to EVER URBAN Master that the AB was unconscious and had stopped breathing.

At 17:40 the AB was transferred to an ambulance standing by at Katakolo port and was taken to the local hospital, where he was pronounced dead.

The investigation pointed out a number of safety issues, such as of whether mooring ropes' repairing should be carried on board or at a specialized shore premise, the evidence of low standards of ensuring safety on board through the safety system, the poor communication among the crew members and the inadequate support system to the Master in cases of emergency handling (in relation to injuries on board and MEDEVAC). Relevant safety recommendations were addressed to the company of the vessel, as indicated in the respective chapter of this report.

Note:

- *This report is mainly based on information and evidence that have derived from the interview process and information collected from those individuals involved in the marine casualty, as well as electronic positioning data provided by the competent authorities of the Hellenic Coastguard.*

2. Factual Information

Figure 1: C/V EVER URBAN (photo credits: Marinetraffic,www.marinetraffic.com)

2.1 Ship particulars

Vessel's name:	Ever Urban
Type of vessel:	Cargo ship (Container carrier)
Flag:	Panama
Port of registry:	Panama
IMO number:	9169160
Call sign:	3FNX9
DOC company (operator):	Evergreen Marine Corporation Ltd.
IMO company no.:	0344771
Date keel laid:	1999
Place of built:	Nagasaki, Japan
Classification society:	ABS
Length overall:	270.40 (m)
Breadth overall:	40.00 (m)
Gross tonnage:	69246
Net tonnage:	30235
Deadweight:	63216
Main Engine max. output:	66120 (PS)
Hull material:	Steel

2.2 Voyage Particulars

Port of departure:	Rijeka (Croatia)
Port of destination:	Piraeus (Greece)
Type of voyage:	International
Cargo information:	Loaded with containers

Safe Manning:	14
Manning:	20

2.3 Weather data

Wind (direction-force):	S – 5 Bf
Sea state:	Moderate waves
Visibility:	Good
Light/dark:	Daylight
Current:	3 knots

2.4 Marine Casualty information

Type of marine incident:	Death of seafarer
IMO Classification:	Very serious marine casualty
Date, time	26-12-2013, 10.00 LT
Location	South Ionian Sea
Position (approx..)	37^{o} 58.2 N, 020^{o} 14.6E
Ship's voyage segment:	Mid-water, on route
Place on board:	Vessel's forecastle deck
Human factor data:	(See analysis part)
Consequences to individuals:	Death of seafarer
Consequences to environment:	None
Consequences to property:	None

3. Narrative

"Ever Urban" is a fully cellular Panamax containership under Panama Flag built in 2000, with carrying capacity of 5.652 TEU trading world widely.

On 24 December 2013 she had departed loaded from the port of Rijeka (Croatia), heading to the port of Piraeus (Greece) with a crew complement of 21 seafarers, including the Master.

On 26 December, morning hours she was underway in the South Ionian Sea, approximately 06 nm SW of Kefalonia Island.

During the mooring meeting between the C/O and the Bosun for the daily tasking, the C/O assigned him to repair the mooring line eye that was found damaged after the mooring operations in Rijeka.

According to task list given, a double braided fibre mooring ropes of "Nylon Core & Polyester Cover" had to be repaired at the "spliced eye" due to abrasion and wear on strands and yarns sustained during mooring operations so as to bring it back in service. Instructions were given to the Bosun by the C/O and the Master for cutting off a short part of the rope and re-terminating the rope end with a new "spliced eye".

At approximately 08:00, the Bosun along with 3 crew members (2 ABs and one OS), went to the forecastle to repair the hawser rope damaged due to abrasion and wear at the eye splice[1].

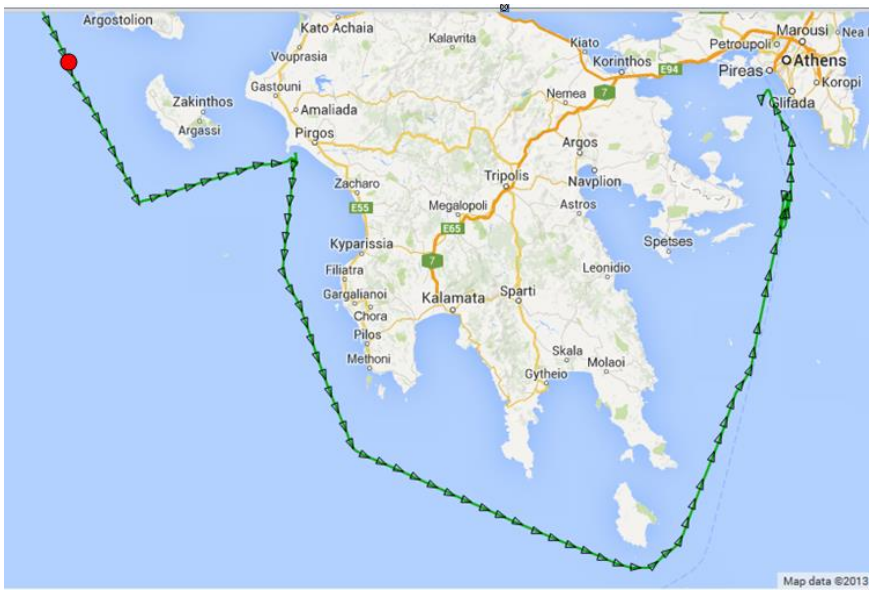

Figure 2: Overview of EVERURBAN's route from Rijeka to Piraeus (vessel's AIS mapping). An approximate position at the time of the accident is marked with a red circle.

3.1 The new «eye splice» task

According to collected information the repairing task for fashioning the new eye splice would be carried out according to good seamanship and experience as well as based on manufacturer's instructions. The task should normally include the following steps:

a. cutting the damaged part of the rope spiced eye;
b. taping or burning the rope's strands in order to avoid any yard unravelling;
c. shaping the appropriate length of new eye (loop);
d. removing part of the core of the double braided rope at the point where the eye (loop) would end on the main body of the rope;
e. penetrating the edge of the rope at the point where the core had been removed;
f. tightening initially the bond of the eye by tapping it with a hammer;
g. placing the mooring line on No5 wrapping drum of the starboard winch;

[1] The **eye splice** is a method of creating a permanent loop (an eye) in the end of a rope by means of rope splicing.
Rope splicing in ropework is the forming of a semi-permanent joint between two ropes or two parts of the same rope by partly untwisting and then interweaving their strands. Splices can be used to form a stopper at the end of a line, to form a loop or an eye in a rope, or for joining two ropes together

h. passing the new spice eye round a fittingly fairlead and secure the spice eye on a fittingly double bollard;
i. tightening & reinforcing the bond of the eye by heaving the winch and gradually applying tension on the rope; and
j. testing it against working load.

The participating in the task crew members went to the fore mooring deck carried the mooring line that was stored in the forecastle and placed it on the deck. Having completed with the «new eye splice» and its tightening step (f), the participating crew members under the instructions of the Bosun proceeded with the set up of the tensioning arrangement on the starboard winch.

In particular, the rope had been wrapped on the winch drum and led around a starboard fairleader and then straight to the starboard double bollard where the eye was initially fashioned. Following the preparation of the new eye splice, the winch would gradually apply load on the rope, to tighten the new splice. Then one crew member would check the splice tightening and if necessary would tap on the splicing point by using a hammer making sure that the rope's edge was properly fitted at the point the core had been removed.

3.2 The tightening - tensioning process

Based on the information gathered during the interview process, at the beginning of the process the Bosun was checking the splice tightening, while the A/B2 was operating the winch and was applying load on the rope.

However, the Bosun was not satisfied with the result of the tensioning operation and decided to repeat the process. Following, the Bosun took over the operation of the winch, relieving the A/B2 while the A/B1 was instructed to check the splice tightening and tap on it, if necessary.

While the rope was under tension and the winch was in heaving (wind in) mode, the A/B2, who was standing close to the A/B1 heard a short rumbling sound from the rope and warned his colleague (A/B1) of the possible danger.

However the A/B2 did not report the stretching sound to the Bosun, so as to stop the heaving operation of the winch and/or to let out (wind out) the rope under tension.

He immediately moved away and went behind the starboard windlass while the O/S, that was standing nearby spontaneously followed him.

Based on the above, the positions of the participating crew members at the moment just before the accident occurred were as marked in **figure 3**.

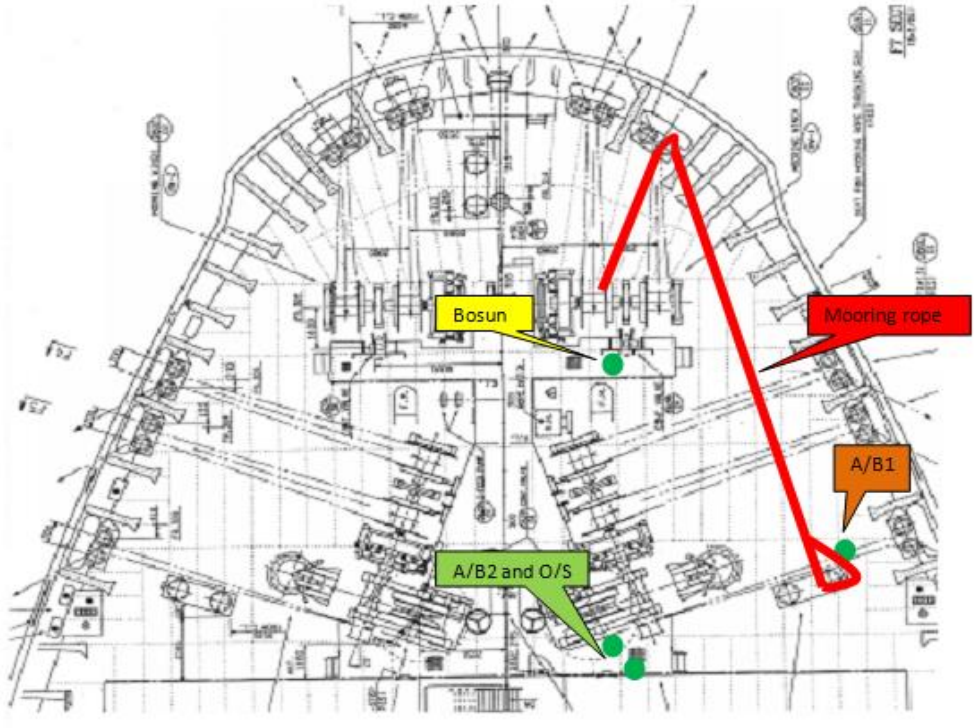

Figure 3: Overview of the forecastle deck with the rope under repair and the positions of the crew members at the moment of the accident.

According to the deriving information from the interview process, at approximately 10:00, while the Bosun was operating no 5 winch on heaving mode and was applying load on the mooring rope, it suddenly parted at the splice bond of the new eye, snapped back towards the fairleader and struck the A/B1 on his left leg to the part of his knee causing his instant fall on the deck. Based on the reports by the crewmembers on scene that ran to assist him he had sustained a heavy fracture on his knee that caused bleeding.

3.3 Emergency Response Actions

3.3.1 Response actions by crew and First Aid team

Following the accident, the Bosun and the A/B2 stayed with the casualty while the O/S was ordered by the Bosun to immediately report the casualty to the OOW on the bridge.

At approximately 10:10 that is within the next 10 minutes from the time of the accident the 'First Aid Team' was assembled under the Second Officer and arrived on the scene.

At 10:22 the casualty was transferred on a stretcher to the vessel's hospital and further first aid was administered.

The First Aid Team was reported to continue administering first aid and medication according to Company's medical instruction emailed at 13:27.

By 14:55 the Officer in charge of the First Aid Team reported to the Master that the seafarer's medical status had been deteriorating, suffering of severe pain and breathing difficulties.

At 17:00, the EVER URBAN's designated First Aid Officer, administered CPR and artificial respiration to the injured A/B in order to maintain his vital signs.

3.3.2. Response actions by the Master/Company/Coastal Services

At 10:24 the Master contacted the Company and reported the accident and requested additional medical advice and instructions.

At approximately 11:45, the 2nd Officer reported to the Master that the injured A/B was feeling more intense pain. At approximately 11:50, the Master contacted Piraeus JRCC, the vessel's company and the vessel's Agent in Piraeus and requested the injured A/B medical evacuation.

At 12:10 the Master was called by Piraeus JRCC on the vessel's satellite telephone and was advised to deviate the vessel's course towards the port of Katakolo, that was the nearest mainland port to EVER URBAN's sailing position so as a MEDEVAC by the HCG SAR Boat located in Katakolo port could be arranged.

At 13:27 the Master received an e-mail from the Company's Doctor, instructing him to make the necessary arrangements for the transfer of the injured A/B to a shore hospital "as soon as possible" for "immediate" surgical treatment, and also advising for adequate first aid treatment and detailed medication until the injured A/B is transferred ashore.

At about 13:40 EVER URBAN established contact communication through VHF with the local Coast Guard Authority of Katakolo, during which the Master was informed that Coast Guard Rescue Class boat «SAR 516» is ready to be deployed to deliver the casualty, at a set meeting position (LAT: 37° 36'8''N, LONG:021° 19'2''E).

By 14:43 EVER URBAN and SAR 516 had arrived at the meeting point, but due to the fact that the sea state was rough the SAR boat could not approach safely alongside EVER URBAN in order to get the injured AB.

Thereafter, at 14:52 the Master requested from the HCG Authorities through email to deploy a rescue helicopter. Following telephone communications it was eventually agreed that the port tug of Katakolo would be deployed to collect the injured A/B.

By 14:55 the Master got informed by the First Aid Officer that the A/B's medical condition deteriorated suffering of increased pain and breathing difficulties.

At approximately 17:00, the First Aid Officer, administered CPR and artificial respiration to the injured A/B in order to maintain his vital signs.

At 17.15, the tug boat approached EVER URBAN and within 5 minutes the injured A/B was successfully lowered on her deck by using EVER URBAN's crane fitted at her starboard stern.

However, at 17.25 the tug Skipper communicated to EVER URBAN that the A/B had stopped breathing.

By 17.40 the A/B was delivered to the ambulance standing-by ashore and was transferred to the local hospital where he was pronounced dead.

4. Analysis

The analysis of the examined marine casualty aims to identify the factors and causes that contributed to it, taking into account the sequence of events and the collection of evidence and information during the investigation process.

It is noted that the analysis is mainly based on information and evidence that have derived from the interview process and evidence collected from those individuals involved in the examined case as well as electronic positioning data provided by the competent authorities of the Hellenic Coast Guard.

4.1 The key crew members

The crew members that were involved in the accident are the following:

1. **The Master**: the 44 years-old Master had 13 years of service at sea and 3 years as Master on the Company's vessels. He had been on board EVER URBAN for approximately 1 month. Although not directly involved in the accident, he was conducting the communications and arrangements for the transfer of the injured crew member to a shore hospital.
2. The **Chief Officer**: the 61 years-old C/O had 40 years of experience at sea. He had been serving with the capacity of the Chief Officer for almost 30 years. Amongst other duties he was responsible for the deck department and its equipment maintenance and following the Master's instructions or after consultation with him he was prioritizing the deck maintenance activities that were assigned to the Bosun. On the day of the accident he had prepared the task list which included the repairing of the mooring rope's damaged eye.
3. The **Bosun**: the 41 years-old Bosun had 16 years of sea experience all on board Company's vessels. He had been serving in the Bosun's capacity for 5 years and had joined EVER URBAN on 19 November 2013 that is almost 40 days prior to the marine accident.
   He was in charge of the deck crew during deck maintenance and he was the winch operator in charge of the mooring operation fore team under the Chief Officer's command. As already recorded he was assigned to repair the damaged mooring rope splice eye and consequently he was in charge of the process on the day the casualty occurred.
4. **The A/B1** (casualty): the 39 years-old A/B was on board EVER URBAN since the 24th of April 2013, that is approximately 8 months before the marine accident occurred.
   He was forming part of the navigational watch as a Look Out. During the period prior to the occurrence he was performing the 08.00-12.00/20.00-24.00 Look Out watches. He was also participating in deck works and maintenance after the navigational watch from 08.00 to 12.00.
5. **The A/B2:** The 29 years-old, A/B had 8 years of sea service and had joined EVER URBAN on the 19th of September 2013, that is almost 3 months before the accident. He was working in deck maintenance as a day time deck crew under the Bosun's command from 08:00 to 17:00.
6. **The O/S:** the 25 years-old, O/S was a new seafarer with 11 months of sea service and had joined EVER URBAN on the 19th of November 2013. He was a day time deck crew member under the Bosun's Command and was not participating in navigational watches.

All the aforementioned crew members held proper certificates for their ranks and capacities and had adequate rest periods prior to the accident, as per relevant evidence gathered.

4.2 The task of fixing the damaged eye of the rope

The whole incident was related to the task of fixing the damaged eye of the rope, which was included in the job list prepared by the C/O.

The replacement of a damaged eye splice of a mooring rope could be considered as a process or task primarily based on both the rope's manufacturer's instructions, if any, and the good seamanship and experience of the deck personnel assigned to perform it and especially on the Bosun's knowledge, skills, experience and good seamanship.

Due to the fact that step (i), as described in paragraph 3.1, requires the operation of a mooring winch where the repaired mooring line is wrapped while the new eye splice is hauled over a bollard, in order tension load could be applied on the rope by heaving the winch and at the same time tightening the new eye's bond and in the absence of a standalone process within the vessel's safety system, the task may be considered as a process similar to mooring operation, therefore the respective safety measures should be applicable.
The details of the task are further analyzed in the following paragraphs.

4.3 Layout - used machinery

As already recorded, the «eye splice» task of the mooring rope was performed on the fore mooring deck.

4.3.1 Fore mooring deck

The fore mooring deck of EVER URBAN had a typical Panamax Containership layout with machinery and mooring equipment as shown **in figure 3** (p. 9).
In general two winches arrangements were fitted port and starboard of the centerline, approximately 7-8 meters from the stem post, each one equipped with two tension drums while the port winch was fitted with a capstan.
Two anchor windlasses were fitted aftwards to the winches, close to the centerline on both sides; each one was also equipped with two tension drums.
A Panama chock, five roller chocks, five fairlead rollers were fitted on each side of the mooring deck; one double bollard was fitted lengthwise about two meters from the panama chock and two double bollards were sufficiently mounted at each aft part of the bow deck as shown in **figure 3** (p.9) and in the next photographs captured during the accident's simulation on board EVER URBAN **(figures 4, 5, 6, 8 & 9)**.

4.3.2 The winch no 5

The winch no 5 was used during the repairing task and more specifically during the heaving (applying tension) of the mooring line after the new eye splice was prepared. The technical specifications of the mooring winch No 5 are quoted in following Table 1:

Table 1: No 5 winch specifications

Rated capacity :	26 tf. x 15 m/min (3rd layer)
Max. Speed :	53 m/min (3rd layer)
Rope :	75 mm x 200 metres
Drum Size :	Dia. 610 x 750 mm
Brake capacity :	Manual Hand Brake (76 tf)
Clutch :	Manual claw clutch
Driving gear :	Enclosed type
Hydraulic motor :	Radial Piston motor
Working Pressure :	Rated 182 kgf/cm2 / max 210 kgf/cm2

During the investigation visit on board EVER URBAN while berthed at Piraeus Container Terminal the winch was used for her mooring and found to be operational and in very good condition.

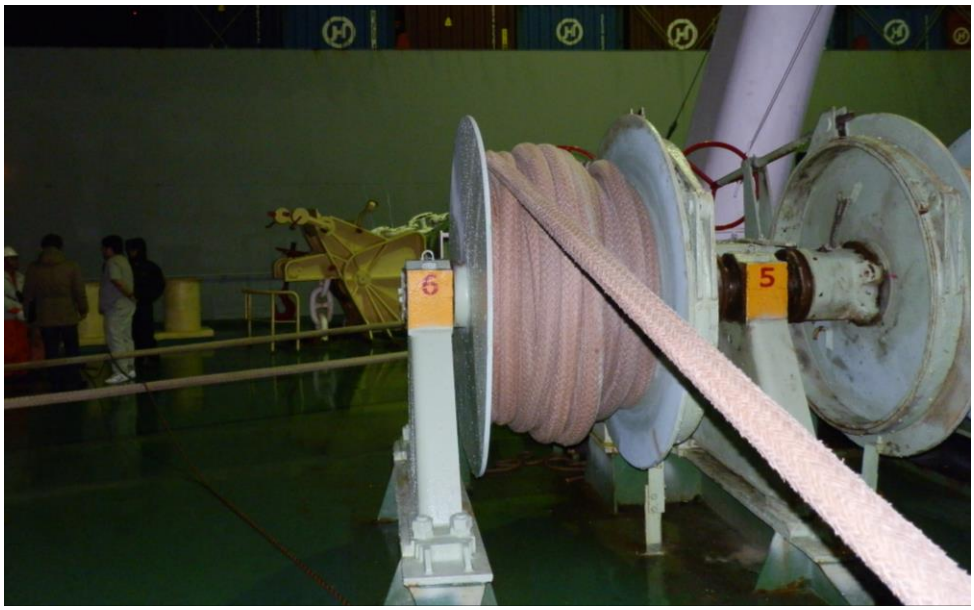

Figure 4:
Winch nr.5 (forecastle deck) was used for applying tension on the rope.

It should be noted that the view from the operating platform of the winch towards the location where the A/B1 was standing was unobstructed as shown in the next **figure 6**.

Figure 6:
View from the operating platform of the winch nr.5, towards the place where the injured A/B was standing at the moment of the accident (in red ellipse). The photograph was captured in terms of simulating the accident. It should be noted that the view is quite good even at night, while the accident happened during daytime.

4.3.3 The fairlead roller and the bollard used

The vertical fairleader used during the «eye splice» tensioning was welded at the starboard bow bulwark and it was found in very good condition. It was the fourth roller to starboard from the panama chock. Its position was in straight line with the capstan in use and could facilitate an easy mooring rope pattern from the winch around the roller and straight towards to the double bollard.
The double bollard used for the securing (hauling over) of the new «eye splice» was in very good condition and was fitted at the starboard stern side of the mooring deck as shown in **figure 7.**

Figure 7 :
Capture of the winch from the bollards which were used to fix the eye of the rope.

4.3.4 The mooring ropes

The set of the mooring ropes of a vessel is part of the mooring system equipment used for the safe mooring operations.

For these reasons the mooring ropes' manufacturers should operate under controlled processes for producing and testing of ropes according to a Classification Society's Rules and Regulations, ISO Standards and/or national standards to ensure the quality level of manufactured ropes. The quality level should indicatively include standards on material and designed requirements, test methods, breaking load and others features of the rope endurance.

It should be noted that upon delivery of mooring lines on board vessels a type approval Certificate (Test Certificate) for every rope type should be issued by a Classification Society, that has prior approved the rope's Manufacturer quality and control standards.

In general the Type Approval Certificate verifies the internationally accepted quality criteria and standards of the rope's specifications as stipulated by Classification Societies and related ISO standards.

Moreover, the inspection and maintenance of the mooring ropes, part of a vessel's mooring equipment falls within the provisions of Chapter 10 of the International Safety Management Code.

In this regard mooring ropes on board vessels must be subject to an inspection plan and activities performed regularly by designated crew members and during the in life service in order to assess their condition and the efficiency of the mooring system.

A vessel's mooring rope's inspection plan under ISM provisions in conjunction with Classification Societies requirements should include inter alia documented checks for external abrasion, chafe, wear and wear between strands and yarns under a scheme aiming to prevent any failures or identify any potential failures or irregularities at an early stage so as to eliminate dangerous situations that could result in personnel's injuries or damages to machinery.

Consequently damaged ropes must be discarded and put out of service or damaged parts should be cut out and spliced.

However taking under consideration the above, splicing is not advisable to be carried out on board as it requires special methods, equipment and specialists to verify that the rope's nominal specifications are retained by a new certificate.

Having regard to the above it is deduced that a rope certificate is not considered valid once the mooring rope is repaired by splicing or eye splice on board a vessel if no testing and inspection of its specifications and standards can be verified through approved technical methods and qualified personnel.

4.3.5 The mooring rope under repair

The mooring rope under repair was a «Double Braid Fibre Rope», **(see figures 7 & 8)** that was certified in November 2011 by a Classification Society and was delivered on board in December 2012.

The rope's specifications are quoted in the following table 2:

Table 2: EVER URBAN parted Double Braided Fibre Rope specifications:

Manufacturer:	Ropers Enterprises Co. Ltd., Taiwan
Rope certificate no :	796-11-028 (20-12-2011)
Type of rope :	Double braid rope
Material :	Polyester cover and nylon core
Diameter :	60mm
Length:	200 metres
Breaking load required:	84.800 Kgf
Breaking load actual :	88.346 Kgf
Identification mark :	kh 800-13-056 / 2013-06-07 / 75 mm Dia. x 200 m

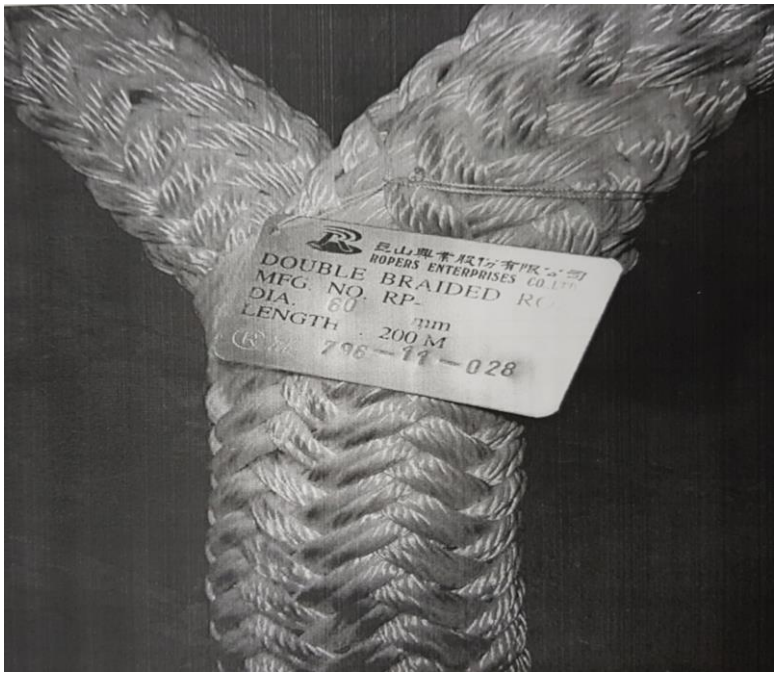

Figure 7: The Double Braided Rope as delivered on board EVER URBAN

Figure 8 : Depiction of a standard double braided fibre rope:

A double-braided rope construction[2] is designed with braided inner-core which is covered with another braided outer sheath. Usually they are made of nylon, polypropylene multifilament, and polyester or a combination of those materials.

The inner-core is possessing approximately 50% of the total rope strength and since it is not subjected to surface abrasion and wear, tends to retain a larger percentage of its original strength over a longer period of time. Therefore, wear on surface strands does not constitute as large a percentage of strength loss as in other constructions[3].

Based on the collected information during the investigation process, the rope was in use for almost two years, but on 24 December 2013 following its use during the mooring operation it was spotted to have sustained damages to its eye that led to its replacement while no other irregularities (abrasions, diameter inconsistencies, cut strands etc.) were reported to have been observed on the rope.

[2] Ref. to the International Marine Purchase Association book, 6th Edition.

[3] OCIMF Mooring Equipment Guidelines 3rd Edition / par. D.1.2 (page 230).

In this context and taking into account the breaking load required as recorded for the specific ropes specifications, was approximately 88 tons in relation to No 5 winch capacities of applying braking load (76 tf), it is inferred that the rope under tension during the casualty could endure the generated pulling forces from the winch.

4.4 Splicing ropes

The **rope splicing** on board vessels is the forming of a semi-permanent joint between two ropes or two parts of the same rope or part of the same rope by partly untwisting and then interweaving their strands. Splices can be used to form a stopper at the end of a line, to form a loop or an eye in a rope, or for joining two ropes together.

Taking into account the analysis in par. 4.3.4 extra consideration should be taken when splicing is planned to be contacted on mooring lines that are to be used during mooring operations.

Rope splicing or eye splicing on board ships is a task that if planned to be done on board, could be performed by deck personnel under the Bosun΄s supervision and instructions as he is in charge of the deck crew (ABs and OS) and delegated with the function to supervise deck maintenance.

As already recorded in par. 4.2, when a Bosun is assigned the task of rope splicing or eye splicing is primarily relying on his knowledge, experience and good seamanship, as well as manufacturer΄s instructions, if any.

4.4.1 The 'new eye splice' on the damaged rope

During the investigation process, manufacturer΄s instructions for the mooring rope΄s splicing, although requested yet were not presented for the investigation purposes.

It was further reported that the Bosun had carried out new eye splices on ropes on other vessels in the past and that it was the first time to perform the eye splice repair on EVER URBAN.

Despite the fact that the task΄s steps as described during the investigation process (see par. 3.1) were followed by the Bosun and the participating crew under his command, the most significant step of tightening & reinforcing the bond of the eye splice by heaving the winch and gradually applying tension on the rope for the purpose of testing it against working load fell short as the eye splice parted at the point of the bond **(figure 9)**.

Figure 9: The spliced eye of the rope which the crew members tried to repair.

In this context it is deriving that the Bosun΄s and the participating crew members' performance for preparing the new eye splice was poor and considered to have been a contributing factor in the marine accident.

Furthermore, taking into account the aforementioned in par. 4.3.4 it is questioned, even in the event that the new eye splice would not have parted, in what way testing and inspection of the repaired mooring rope΄s specifications and standards would have been verified for safe use during

mooring operations and whether the issued «Type Approval» certificate initially issued by the Classification Society would be still valid.

4.4.2 The 'new eye splice' tensioning

The eye splice tensioning on mooring lines is the final phase that actually generates forces on the rope under tension and thereby the process should be considered similar to heaving and securing of the mooring lines' procedure during a mooring operation as already analysed in par. 4.2 and in related references in the analysis.

In view of the above and despite the fact that the eye splicing task pertains minor hazards for the involved crew during the forming of the new eye, the tensioning process is considered a high risk undertaking when the winch is in use and forces comparable to mooring operation are gradually being developed.

For this reason, in the absence of specific reference within the vessel's Safety Management Manual, safety measures similar to mooring operations should be taken that are associated with potential parting of the line and its snap back zone in order to safeguard the involved personnel.

In respect to the requirements of the International Safety Management Code/Chapter 7 "Shipboard operations", EVER URBAN Safety Management Manual under the *«Procedure for departure /Arrival a Port»* incorporated in par. 4.4 «Mooring operation and unmooring operation», a set of instructions to be followed.

The instructions that are deemed to be pertinent to the eye splice tensioning process emphasized that:

«4.4.4 C/O is responsible for commanding the safe mooring operation at fore station. 2nd Officer is responsible for commanding the safe mooring operation at aft station.

4.4.9 Care should be taken to the layout moorings, all persons in the vicinity should remain in position of safety when the moorings are strained.».

Aforementioned instructions should have been taken into account by the C/O when assigning the Bosun with the task of the eye splicing and should have led him to plan the rope's tensioning as a similar to mooring operation process.

It should have furthermore equally led the Bosun to take the same safety measures as to mooring operations when operating the winch in heaving mode and on these grounds he should have instructed the AB1 to move away from the potential snap back zone to a safer location, before increasing the load on the rope.

The failure of the C/O and the Bosun to identify the 'new eye splicing' as a process similar to the mooring operation that could pose risks to the involved personnel and therefore to take the appropriate safety measures, is considered as a contributing factor to the examined marine casualty.

4.4.3 The parting of the new eye splice

As already presented in par. 4.3.5 the mooring rope was in good condition while the analysis in par. 4.4.1 highlighted that the new eye splice was prepared under the Bosun's knowledge, experience and good seamanship.

The winch in operation under the Bosun was of a standard type and was not equipped with instruments indicating the pulling force during the heaving (applying tension) mode and monitoring the winch's torque overload limit that is set in order for the operator to assess the rated value of the winch pulling force in relation to the breaking load of the line under tension. Therefore, it is deduced that the Bosun was operating the winch based on his experience, yet without any indication of the load value that was applied on the rope.

In consideration of the above it derives that the rope could have parted either due to an over its limit applied load - beyond its tensile tolerance which was not known for the repaired part near the eye – or due to poor splicing utilized practices.

For these reasons and the analysis in par. 4.4.1, a new eye splice should be fashioned at the manufacturer's premises or at a certified workshop with the appropriate equipment, testing standards and specialized personnel.
Aforementioned acceptance is also supported by many ropes' manufactures and Classification Societies in order for the rope's «certain physical and mechanical properties» to be evident and attested according to international standards[4] in order to avoid the rope's specifications degradation that could lead to unsafe situations during mooring operations.
It is therefore inferred that the 'new eye splice' mooring rope tensioning on board EVER URBAN carried out under crew members not specialized in this operation and without the appropriate equipment and testing standards is considered to have been a contributing factor into the resulted marine casualty.

4.5 Safety assessment

As recorded in par. 4.2 & 4.4.2 the task of forming an eye splice is not considered a highly risk task during the first steps of the process; yet during the phase of applying load to check the bond of the new eye, it is evolved to a quite hazardous process as the risk of the rope parting is quite high.
According to information collected during the interview process of the crew members participating in the task, it was reported that all of them were aware of the associated risks of tensioning the mooring rope's eye splice and the potential danger of the rope parting and the danger of being within the "snap back zone"[5].
Notwithstanding the above the AB1 remained within the snapback zone of the mooring line under tension while it was being heaved by the Bosun.
It is noted that in terms of PPE, it was reported that the participating crew members were wearing safety helmets, overalls and safety shoes according to shipboard standard safe working practices.

4.5.1 Risk assessment

The International Safety Management Code (ISM Code-SOLAS 74), as applied in Chapter. 1.2.2 & 1.2.2.2 states that: "The Safety Management objectives of the Company should inter alia assess all identified risks to its ships, personnel and the environment and to establish appropriate safeguards".
Even though, the ISM Code does not provide any further explicit reference apart from the above general requirement, risk assessment[6] or risk analysis is fundamental for the compliance with most of the Code's clauses.
Although there is not an exact formal definition of risk, it could be defined as: "The combination of the frequency and the severity of the consequence".
The risks concerned are those that are reasonably expected and are related to shipborne procedures or operations in respect to:

- ⇨ the health and safety of all those who are directly or indirectly involved in the activity, or who may be otherwise affected;
- ⇨ the property of the company and others;
- ⇨ the environment.

A hazard could be defined as a situation or practice that has the potential to cause harm. Hence a risk analysis process or management of risk could concisely include the following phases:

[4] ISO 2307 standards, others related and OCIMF. OCIMF recommends that HMPE mooring ropes should not be spliced on board as they require specialists (par. 232).
[5] A snap-back is the sudden recoil of a mooring line as a result of its failure under tension. A snap-back zone on a mooring deck is the space where it is anticipated that the parted mooring line could recoil with great velocity, possibly resulting in injury or even death to crew present within this zone.
[6] Risk management as of related ISO Standards may be defined as: "The process whereby decisions are made to accept a known or assessed risk and/or the implementation of actions to reduce the consequences or probability of occurrence.".

- ✓ the identification of hazards;
- ✓ the assessment of the risks associated with those hazards;
- ✓ the application of controls to reduce the risks that are deemed intolerable. The controls may be applied either to reduce the likelihood of occurrence of an adverse event, or to reduce the severity of the consequences;
- ✓ the monitoring of the effectiveness of the controls.

The ISM Code does not lay down any particular venue models to the management of risk and therefore the company is to stipulate methods in view of its organizational structure, its ships and operations. The methods should be systematic, if assessment and response are to be complete and effective, and the procedures should be documented so as to provide evidence for the decision-making process.

4.5.2 Risk assessment for the tensioning process

As already recorded in previous related paragraphs, despite the fact that the task assigned required the operation of the winch in heaving mode, neither a documented risk assessment had been carried out prior to the commencement of the task nor any safety briefing meeting took place under the C/O or the Master or even between the participating team, in order to identify any potential hazardous situations, and their associated risks including the pinpointing of the snap back zone according to the indented mooring rope arrangement in case it would part and any controls taken or measures to mitigate or to eliminate the associated risks.

Taking into account that in practice the tensioning process of the eye splice and its bond do not necessitate close attendance, checking or «work with hands» from a crew member, it is considered that the Bosun did not give any safety instructions to the deck crew engaged with the undergoing task.

Moreover according to the information collected during the investigation process that indicated that the A/B2 and the O/S, during the second time the Bosun heaved the mooring rope, moved away from the bollard over which the rope was hauled and went to a location protected **(figure 10)** against a potential parting of the mooring rope and its snap back zone without being instructed, as well as the fact that the A/B1 remained standing very close to the bit and within the snap back zone of the eye splice under tension **(figure 11)**, implies that the A/B2 and the O/S protected themselves on their own initiative and the Bosun was neither monitoring the situation closely or following any safety measures.

Figure 10: The position where the A/B2 and the O/S were standing at the moment of the accident (photo captured during the simulation of the accident).

Figure 11: Approximate position of the A/B1 at the moment of the accident; in the background the position of the Bosun, controlling the winch, is indicated with a red arrow (photo taken during the simulation of the accident).

It is consequently conceived that had a risk assessment been carried out or safety instructions been provided to the Bosun and the crew involved in the task or to the A/B 1 on spot, in order to keep a safe distance and stand at a place protected from a possible snapback while the load on the rope was applied, the A/B1 would not have been struck and injured by the parted mooring rope.

In consideration of the aforementioned the failing of identifying that a risk assessment was required for the tensioning process of the repaired mooring line is presumed as a contributing factor in the examined case.

4.6 Working language and communication

According to SOLAS Chapter V Safety of Navigation Reg. 14.3 & 4, working common language has to be established on board all vessels determined by Master or Company and to be recorded in a vessel's Log Book in order to ensure effective crew performance in safety matters. Each seafarer is required to understand and where appropriate, give orders and instructions and to report back in that language.

English language is to be used as the working language for bridge-to-bridge and bridge-to-shore safety communications as well as for communications on board between the pilot and bridge watch keeping personnel, unless those directly involved in the communication speak a common language other than English.

The working language on board EVER URBAN was English and was recorded in her Log Book as the crew was multinational; Nonetheless Chinese was also used on board by many of the crew members that were from China or Taiwan.

However, during the interview process, neither the O/S nor the Bosun could speak basic English and for this reason a translator was used from English to Chinese and vice versa.

On the grounds of the above it is deduced that the respective provisions SOLAS Chapter V/Reg.14.3 & 4 were not satisfied in full by the Bosun and the O/S.

However apart from SOLAS requirements, a common speaking language may limit or avoid any language barriers on board vessels with multinational crew; and can facilitate the communication during the daily work, task and assignments and moreover during emergency situations that may occur.

On this basis Master's and crew's responsibilities and duties are effectively and safely performed in as much as language barriers and misunderstandings may create dangerous situations and cause accidents.

It is noted that EVER URBAN had a crew multinational complement of 21 seafarers of three different nationalities.

Deck Officers and most of the Engine Officers were Taiwanese, as well as three deck ratings, three deck ratings were Philippines and the Cook department crew members were from Chinese.

As already mentioned the crew members who participated in the eye splice task were of two different nationalities and more specifically the Bosun and the O/S were Taiwanese and the two A/Bs were Philippines. Therefore, the language used by the team to communicate and understand each other was reported to be English.

However, communication in English during the interview process could not be practiced for the Bosun and the OS (as per par. 4.6), despite the fact that both seafarers during the familiarization procedure had signed the applicable to EVER URBAN's Safety Management System form (FM-04-02) that in item (1) stated that that the seafarer is able to: *«Communication with other persons onboard on elementary safety matters»*.

To that end It is considered that there was a lack of proper communication in English between the participating crew in the eye splice task and process that could have deterred A/B2, from (promptly) reporting in good time to the Bosun (not able of speaking basic English) the potential danger of the rope parting, having heard the generating short rumbling sound from the rope's stretching due to the applying load.

In consideration of the above, the poor level of communication in English or seemingly the participating in the task crew members' and the Bosun's inability to effectively communicate among them is construed as a contributing factor to the marine accident.

4.7 Supervision

Based on the evidence gathered during the investigation the Bosun was in charge supervising the task to be carried out while he was in parallel involved in the task.
As already mentioned the new eye splice fixing was considered as a task with minor hazards, not capable to cause heavy injuries or threaten life.
However the winch operation process may represent risks and hazardous situations.
The fact that the Bosun during the last phase of the tensioning process was supervising the undergoing process and was in parallel operating the winch could have distracted him from properly monitoring the evolving situation and the foreseeable danger at the eye splice area.
As mentioned in paragraph 4.3.2 and shown in figures 6, 7 & 11, the Bosun could have a clear view towards the position of the crew members and therefore could have noticed that A/B1 was standing at a dangerous area while he was gradually increasing the applied load on the rope by heaving the winch and that the A/B2 and the O/S had suddenly ran away from the same area.
In view of the above it is presumed that had the Bosun been observing the A/B1's position prior to the accident and the A/B2 and OS action to protect themselves behind the starboard windlass he could have realized the potential danger of the rope parting that could have led to other actions taken such as preventing him from increasing the applied tension or urged him to stop the winch operation or to reverse it to pull out mode.
It is therefore presumed that had a senior Deck Officer been assigned with the supervision of the mooring rope´s tensioning operation, it is highly possible that the process would have been more adequately and effectively monitored and the evolved situation would have been avoided.
The lack of proper supervision by the Bosun as well as the lack of assigning to a senior Deck Officer to supervise the rope´s tensioning process in hand is identified as contributing factors in the marine accident.

4.8 Human actions´interaction & safe working practices

It should be recognized that the level of risk is differently perceived by each person and is mainly affected amongst others by:

- his personality; competences and skills;
- the clarity of instructions provided that should be efficient and safety oriented;
- the way the instructions are communicated and in parallel understood;
- the ability of the individual to anticipate what will happen next which in turn is based on the skills, personal experience and situational awareness.

As analyzed in this case and also in similar cases investigated by HBMCI, common factors are highlighted that can evaluate and lead to the crew's actions or omissions, under certain circumstances.
However, in general nowadays human element in the context of accident investigation should be considered as a systemic-perspective rather than as a mere assessment of individual performance immediately prior to the accident.
Personnel engaged in daily shipboard tasks or operations that entail risk or hazards may not be able to give their full attention to the assignment or operations carried out and at the same time guard themselves against possible dangers.
Each seafarer may have a variable performance in his daily routine, including actions or omissions that may lead to dangerous situations. However, a solid safety system should be in place to safeguard against this type of variable performance and ensure the levels of safety during tasks and processes on board.
In the examined case the combination of the facts and that no risk assessment was carried out, no instructions were given to the work team members to guard themselves against personal injury, no supervision was in fact exercised during the rope´s tensioning and the poor communication between the crew, is indicative that the safety system was not adequately implemented on board for the planning and execution of the whole task of repairing the hawser rope.

4.8.1 Task planning

As already recorded in par. 3 & 4.2 the C/O assigned to the Bosun the task of repairing the mooring rope's eye splice.

In view of the analysis in par. 4.4 (splicing ropes); 4.5.2 (risk assessment for the tensioning process); 4.6 (Working language and communication); 4.7 (supervision); 4.8 (human element); and below par. 4.8.2; it is inferred that the C/O did not take into consideration facts and factors that could cause hazards to the involved crew and based on that the task of repairing the rope was not adequately and efficiently evaluated and planned.

The lack of an adequate and efficient planning for the mooring rope's repairing task tailored to the involved crew particularities and attributes is construed as a contributing factor in the examined case.

4.8.2 Safe Working Practices

In view of the analysis in par. 4.8; and 4.8.1; 4.9.2; and 4.9.3, a reference is made to the "Code of Safe Working Practices for Merchant Seamen (CSWP) 18[7]", published by the UK Maritime and Coastguard Agency. Although not being mandatory, it is served as a "best practice guidance" for improving health and safety on board ships. The "Code", is an effective tool by providing guidance on safe working practices for vessel managers and crews and has been widely used in the maritime industry.

According to the Code, the seafarers (workers) are in general required to:

- take reasonable care for their own health and safety and that of others on board who may be affected by their acts or omissions;
- report any identified serious hazards or deficiencies immediately to the appropriate officer or other authorized person;
- make proper use of plant and machinery, and treat any hazard to health or safety (such as a dangerous substance) with due caution.

Additionally, Chapter 26 of the referred publication describes the safety precautions that should be considered when anchoring, mooring and towing operations are being carried out.

Although the job task under investigation, regarding the maintenance of the hawser rope, was not considered as identical to a mooring operation, the analysis in par. 4.2, 4.4.2 & 4.4.3 pointed out that the forces developed during a new eye splice tensioning are comparable to those of the mooring operation.

Consequently, useful guidance and hints for managing the safety issues of similar situations and tasks that the Code/Chapter 26 prescribes in certain paragraphs could be applied in this case as deems accordingly :

⇨ 26.1.2 Based on the risk assessment, appropriate control measures should be put in place. It is particularly important that the risk assessment considers the consequences of failure of any equipment.

⇨ 26.3.2 Owing to the design of mooring decks, the entire area should be considered a potential snap-back zone. All crew working on a mooring deck should be made aware of this with clear visible signage.

⇨ 26.3.12 Personnel should not, in any circumstances, stand in a bight of rope or wire. Operation of winches should be undertaken by competent seafarers to ensure that excessive loads do not arise on moorings.

⇨ 26.3.13 When mooring lines are under strain, all personnel in the vicinity should remain in positions of safety, i.e. avoid the snap-back zones. […]
«…seafarers should always be aware of other areas of potential danger – the whole mooring deck may be considered a danger zone.».

[7] https://www.gov.uk/government/publications/code-of-safe-working-practices-for-merchant-seafarers-coswp-2018

Based on the above it is presumed that the lack of incorporating proper safety instructions that are by standard applied to all mooring operations as "safe working practices" in the Company's and EVER URBAN's Safety Management System is considered as contributing factor into the marine accident.

4.8.3 Fitness for work - Fatigue

As mentioned in paragraph 3.2 all the crew members participating in the task were fully certified for their ranks. They had all completed the familiarization process on board and relevant documentation had been completed on that.

In terms of rest, as per evidence gathered, they had all had proper rest hours during the previous days and nights, as 3 of them were exclusively working during daytime and the only the casualty A/B1 was also performing duties as a Look Out during navigational watches. He had finished his watch at midnight that is 8 hours before reporting for duty. Therefore they had normally reported for duty on the morning hours of the 27th of December and consequently tiredness or fatigue were not considered as contributing factors for the examined marine casualty.

4.9 Environmental conditions

The task of fixing the rope was carried out during daytime (started at approximately 08.00). The local weather was reported to be cloudy (overcast), with temperature at 18^{o}C and the wind was SSE with a force of 5 Bf. The swell was at 2m and the sea state was reported at 4 (moderate).

In general for a ship of the size of EVER URBAN, the environmental conditions at the time of the accident did not have any significant impact on the task that was being carried out on the forecastle mooring deck, therefore are not deemed to have contributed to the accident.

4.10 Emergency response & Safety management

4.10.1 Emergency response

Based on the information of the investigation process and the collected evidence, the crew actions that followed the accident as described in par. 3.3.1 were performed so as to administer first aid treatment to the injured A/B.

Nevertheless, taking into account that the timeline of actions and facts recorded and more specifically:

- the initial deterioration of the casualty medical condition at 11:45;
- and the Company's urging and imperative instructions to send the casualty to shore "as soon as possible" for immediate surgical treatment, received at 13:27;

could have led the Master to the decision to directly request the MEDEVAC of the injured A/B by helicopter during his first contact with the Coastal Authorities.

At the time the helicopter was requested by the Master at 14:52, the option to transfer the A/B ashore by a tug boat, already called, was eligible in as much as a helicopter's deployment would apparently require further time consuming procedures.

Moreover, no feedback was requested from the Master by the Company on his actions and the condition status of the injured seafarer, even after the medical advice was provided by the cooperating company doctor by e-mail, which may have led the Master to believe that all necessary actions to deal with the situation had been taken.

The evaluation of the casualty's medical status information appeared to have been misjudged by the Master, who nevertheless is not a doctor, as well as from the support system of the company that should be in place for confronting the emergency.

The lack of the emergency evaluation is conceived as a contributing factor in the examined marine casualty. The lack of support to the Master is indicated in the following paragraph.

4.10.2 Safety management

With respect to Chapter 8 «Emergency Preparedness» of the International Management Code (ISM), the Company of EVER URBAN had developed procedures in order to manage emergency situation on board its vessels.

The procedures were recorded in a specific document (PR-08-01) under the title: *«Procedure for handling emergency matters in the Company».* The procedure was defining the management of matters related to Company's ships' accidents.

The document was establishing an 'Emergency Response Team' and was mostly addressing responsibilities, duties and actions in marine accidents involving the Company's ships however injuries to seafarers were not elaborated, apart from a reference that the Company's 'Emergency Response Team' should include amongst others a Doctor.

Consequently, no specific procedures or instructions to Master to manage personnel's injuries and health issues were put in place.

Based on the information and evidence gathered during the investigation process it was emerged that the Company, apart from the initial doctor's instructions, did not verify if medical instructions had been followed or how they had been practised on the casualty. It was further emerged that the Company was not closely monitoring the evolving medical condition of the injured seafarer, or the status of his transfer to a shore hospital.

It was additionally deduced that the exchange of reports and instructions, as a continuous update and feedback on the emergency between the Company and the Master in order to support the Master's decisions was neither recorded nor exercised.

In view of the above it derives that the downtime period of the Master to effectively evaluate the critical condition of the seafarer's medical status under the prevailing circumstances and incoming information and instructions was not addressed and evaluated by the Company's Doctor and 'Emergency Response Team' and on these grounds it is considered a contributing factor into the loss of the injured A/B.

The Company's lack of incorporating specific procedures for managing injuries to seafarers or health issues that would closely monitor and support "Master's decisions" and on-going related matters is presumed to have been a contributing factor in the investigated case.

5. Actions Taken

Actions taken were not communicated.

The following conclusions, safety measures and safety recommendations should not under any circumstances be taken as a presumption of blame or liability.
The juxtaposition of these should not be considered as an order of priority or importance.

6. Conclusions (references denote respective paragraphs of the analysis)

6.1 Conclusions and safety issues led to safety recommendations

6.1.1 The tensioning process of the mooring rope was not assessed as a similar to mooring operation procedure **(§ 4.2)**.

6.1.2 A mooring rope "test certificate" is not considered valid once the mooring rope is repaired by splicing or eye splice on board a vessel **(§ 4.3.4).**

6.1.3 Mooring lines' splicing preparation on board vessels cannot attest and verify the spliced mooring line specifications and standards that have to be retained. **(§ 4.3.4)**.

6.1.4 The new eye splice was prepared under the Bosun's knowledge, experience and good seamanship **(§ 4.4)**.

6.1.5 The process of tightening, reinforcing the bond of the new eye splice and testing it against working load fell short and Bosun's performance on the task was poor. **(§4.4.1)**

6.1.6 The mooring rope's type approval "Test certificate" specifications and standards issued by the Classification Society is not valid once a new eye splice is fashioned on board **(§ 4.4.1)**.

6.1.7 The Chief Officer and the Bosun did not identify the mooring rope's tensioning process as a procedure similar to mooring operation entailing similar risks and hazards **(§ 4.4.2)**.

6.1.8 The mooring rope's parting could have been caused due to an over its limit applied load by the winch operator or due to poor splicing practises utilized **(§ 4.4.3)**.

6.1.9 A new eye splice should be fashioned at the manufacturer's premises or at a certified workshop with the appropriate equipment; testing standards; and specialized personnel in order to avoid the rope's specifications degradation that could lead to unsafe situations during mooring operations **(§ 4.4.3)**.

6.1.10 The mooring rope 'new eye splice' tensioning was carried out under unspecialized personnel, without the appropriate equipment and testing's standards **(§ 4.4.3)**.

6.1.11 No risk assessment process was elaborated prior to the task nor safety instructions were provided on spot before the mooring rope's tensioning process commenced **(§ 4.5.2)**.

6.1.12 The working language provisions of SOLAS Chapter V/Reg.14.3 & 4 were not satisfied in full by the Bosun and the O/S **(§ 4.6)**.

6.1.13 The lack of proper communication in English between the participating crew in the eye splice could have deterred A/B2 from reporting in good time to the Bosun the danger of rope parting **(§ 4.6)**.

6.1.14 Neither a senior Deck Officer was assigned to supervise the rope's tensioning process nor the Bosun's supervision was properly performed **(§ 4.7)**.

6.1.15 The safety system was not adequately implemented on board for the planning and execution of the whole task of repairing the rope**(§ 4.8)**.

6.1.16 No adequate and efficient task planning was conducted by the Chief Officer according to the involved crew particularities and attributes **(§ 4.8.1)**.

6.1.17 EVER URBAN's Safety Management System was not incorporating standard and proper "safe working practices" **(§ 4.8.2)**.

6.1.18 The emergency situation was not effectively managed by the Master **(§ 4.10.1)**.

6.1.19 The Company did not have a documented support system for the Master in order to verify the execution of the medical instructions' and follow-up the actions **(§ 4.10.2)**.

6.1.20 The Company's Emergency matters response procedures did not incorporate detailed procedures for managing injuries and health matters to personnel in order to support the "Master decisions" **(§ 4.10.2)**.

6.2 Conclusions and safety issues that did not lead to safety recommendations

6.2.1 The new eye splice was prepared under the Bosun΄s knowledge, experience and good seamanship **(§ 4.4.1)**.

6.2.2 The Bosun΄s performance for preparing the new eye splice was poor **(§ 4.4.1)**.

6.2.3 The mooring rope's parting could have been caused due to application of an over its breaking limit load by the winch operator or due to poor splicing practises utilized **(§ 4.4.3)**.

6.2.4 The casualty A/B disregarded the safety assessment of the tensioning process and remained within the snap back zone **(§ 4.5.1)**.

7. Safety Recommendations (references denote conclusions)

Taking into consideration the analysis and the conclusions derived from the safety investigation conducted, the following recommendations are issued:

Managers/owners are recommended to:

87/2013: Supplement fleet-wide the standing shipborne operations procedures by incorporating the mooring line tension process as a mooring procedure requiring risk assessment and adequate planning and supervision and ensure the respective training and familiarization ***(con. 6.1.1 - 6.1.9 - 6.1.12 - 6.1.13 - 6.1.14 - 6.1.15)***.

88/2013 Take appropriate actions to assess whether the splicing of ropes used for mooring operations should be carried out on board or to an external specialized premise, taking into consideration Classification Society's guidance and OCIMF recommendations***(con. 6.1.2 - 6.1.3 - 6.1.5 - 6.1.7 - 6.1.8)***.

89/2013 Review the safety management system in relation to safe working practices by incorporating MCA recommended practices ***(con. 6.1.15).***

90/2013: Review the safety management system fleet-wide to better address emergency response for injuries to ship's personnel and seafarers' health related issues, especially by improving the support to the Master and the follow-up ***(con. 6.1.16 - 6.1.17 - 6.1.18).***

91/2013: Take appropriate actions to ensure that SOLAS Chapter V/Reg.14.3 & 4 requirements are fully satisfied by recruited personnel in order to reassure that crew communication is effectively practiced in English ***(con. 6.1.10 - 6.1.11).***

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