

Marine Safety Investigation Unit





MARINE SAFETY INVESTIGATION REPORT

Safety investigation into the serious injury on board the Maltese registered general cargo

HOPA

at the Port of Caronte, France on 16 February 2013

201302/021 MARINE SAFETY INVESTIGATION REPORT NO. 07/2014 FINAL Investigations into marine casualties are conducted under the provisions of the Merchant Shipping (Accident and Incident Safety Investigation) Regulations, 2011 and therefore in accordance with Regulation XI-I/6 of the International Convention for the Safety of Life at Sea (SOLAS), and Directive 2009/18/EC of the European Parliament and of the Council of 23 April 2009, establishing the fundamental principles governing the investigation of accidents in the maritime transport sector and amending Council Directive 1999/35/EC and Directive 2002/59/EC of the European Parliament and of the Council.

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The objective of this safety investigation report is precautionary and seeks to avoid a repeat occurrence through an understanding of the events of 16 February 2013. Its sole purpose is confined to the promulgation of safety lessons and therefore may be misleading if used for other purposes.

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LIST OF REFERENCES AND SOURCES OF INFORMATION

Managers and crew members of MV Hopa

GLOSSARY OF TERMS AND ABBREVIATIONS

°C	Degrees Celsius
AB	Able seaman
GT	Gross Tonnage
IMO	International Maritime Organization
ISM	International Safety Management
kW	Kilowatt
m	Metres
mm	Millimetres
mmin ⁻¹	Metres per minute
MSC	Maritime Safety Committee
MSD	Merchant Shipping Directorate
MSIU	Marine Safety Investigation Unit
OS	Ordinary Seaman
RPM	Revolutions per Minute
SMS	Safety Management System
SWL	Safe working load
VHF	Very High Frequency

SUMMARY

On 16 February 2013, the Maltese registered general cargo vessel *Hopa* was berthing at the Port of Caronte, France when one of the forward mooring team crew members was severely injured in both legs and his left arm after the starboard headline jumped off the bitts whilst under strain. At the time of the accident, the injured crew member was trying to fix a 'stopper line' arrangement, in order to shift and fasten the headline in way of the vessel's double bitts.

Soon after the accident, the injured crew member was given initial medical treatment on board although the first diagnosis of his injuries was made by a first aid shore team. The diagnosis confirmed that the crew member had sustained serious fractures to both his legs and his left arm and had to be disembarked and treated in a hospital ashore.

The safety investigation identified a number of issues related to the mooring operation, including the experience and training of the injured crew member, supervision, and the implementation of the safety management system vis- \dot{a} -vis the dissemination of safety lessons on board.

Three recommendations were made to the ISM managers in order to enhance safety of crew members during mooring operations.

FACTUAL INFORMATION

1.1 Vessel, Voyage and Marin	c Casually 1 articulars
Name	Нора
Flag	Malta
Classification Society	Nippon Kaiji Kyokai
IMO Number	9106986
Туре	General cargo
Registered Owner	Hopa Maritime Ltd.
Managers	Selkar Gemicilik A.S.
Construction	Steel (Double bottom)
Length overall	134.45 m
Registered Length	123.96 m
Gross Tonnage	7255
Minimum Safe Manning	15
Authorised Cargo	Solid cargo
Port of Departure	Ceuta, Spain
Port of Arrival	Caronte, France
Type of Voyage	International
Cargo Information	In ballast
Manning	18
Date and Time	16 February 2013 at 1230
Type of Marine Casualty or Incident	Serious Marine Casualty
Location of Occurrence	Caronte, France
Place on Board	Forecastle deck
Injuries/Fatalities	One seriously injured
Damage/Environmental Impact	None
Ship Operation	Manoeuvring
Voyage Segment	Arrival
External & Internal Environment	Northerly gentle breeze and moderate sea. External temperature recorded at 16°C.
Persons on Board	18

1.1 Vessel, Voyage and Marine Casualty Particulars

1.2 Description of Vessel

MV *Hopa* is a 7,255 GT multi-purpose general cargo vessel built at Selah Shipyard, Istanbul, Turkey in 1995. The vessel is registered in Malta and is classed by Nippon Kaiji Kyokai (NKK). The vessel is owned by Hopa Maritime Ltd. and managed by Selkar Gemicilik A.S., Turkey. The overall length of the vessel is 134.45 m, the breadth is 18.00 m and she has a moulded depth of 10.60 m. The vessel's cargo space consists of four cargo holds, located forward of the accommodation spaces and the engine-room. The cargo holds are covered by hydraulically operated hatch covers of the folding type.

Hopa's double bottom space is divided into four sets of compartments, which are further divided into port and starboard tanks by a longitudinal bulkhead. In addition, the topside space is divided into three sets of compartments, which are also divided into port and starboard tanks. The forepeak tank, all double bottom tanks and topside tanks are used for water ballast.

Propulsive power is provided by a MAN B&W 6L35MC two-stroke internal combustion diesel engine, developing 3,900 kW at 210 RPM. The engine drives a VSA 630 variable pitch propeller. The manoeuvrability of the vessel is further enhanced by a BERG SP35 bow thruster, developing 260 kW.



Figure 1: MV Hopa

1.2.1 The forecastle deck

Each side of the forecastle deck (Figures 2 and 3) is fitted with two sets of double bitts, one set of rollers, and an anchor windlass fitted with capstans for the handling of mooring ropes. The forecastle bulwark has one set of triple fairlead running fore and aft, one chock, one fairlead chock on each side, together with one Panama chock fitted in the centre. The full set of mooring equipment on the forecastle deck is tabulated below (Table 1). The forecastle deck did not have any 'snap back zones markings'.



Figure 2: General starboard side view of the forecastle deck



Figure 3: Fore to aft view of the forecastle deck

No	Fore Mooring Deck Ma	chineries	Particulars	
		Wheel	Gypsy wheel, 8 ton, 14	m/min
(F-1P)	(F-1P) Windlass & Mooring Winch (with chain compressor)		Chain SWL 108 ton, 56 mm x 247.5 m	
		P-Warping Drum	High speed 22 m/min – Low speed 11 mmin ⁻¹	
		Hydro Power Unit	45 kW x 1	
		Wheel	Gypsy wheel, 8 ton, 14 mmin ⁻¹	
(F-1S)	Windlass & Mooring Winch (with		Chain SWL 108 ton, 56 mm	
(1 13)	chain compressor)	P-Warping Drum	High speed 22 m/min – Low sp	eed 11 mmin ⁻¹
		Hydro Power Unit	45 kW x 1	
No	Fore Mooring Deck Fittings		Particulars	SWL*
(F-2P)	Double Bollard	⊠460 mm		600
(F-2S)	Double Bollard	⊉460 mm		600
(F-3P)	Double Bollard	⊠460 mm		600
(F-3S)	Double Bollard	 ⊿460 mm		600
(F-4P)	3-Roller fairlead	250 mm		220
(F-4S)	3-Roller fairlead	250 mm		220
(F-5P)	2 Roller Pedestal Fairlead	250 mm		220
(F-5S)	2 Roller Pedestal Fairlead	250 mm		220
(F-6P)	Universal multi-angle fairlead	300 mm x 180mm	X 2125 mm, 5 + 2 Rollers	250
(F-6S)	Universal multi-angle fairlead	300 mm x 180mm	300 mm x 180mm X 🛛 125 mm, 5 + 2 Rollers	
(F-7C)	Panama Chock	400 mm X 270 mm	400 mm X 270 mm, A12, DIN81915 400 mm X 270 mm, A12, DIN81915	
(F-8P)	Panama Chock	400 mm X 270 mm		
(F-8S)	Panama Chock	400 mm X 270 mm	n, A12, DIN81915	625
*As per 1	MO MSC/Circ. 1175, SWL applies for a sin	ngle post (no more than	one turn of one line).	

Table 1: Mooring equipment on the forecastle deck

Figure 4 is a sketch prepared by the master, showing the approximate positions of the crew members involved in the mooring operation at the time of the accident.

1.3 Crew Members

The crew compliment was 18, *i.e.* four deck officers, three engineering officers and 11 ratings, who were assigned various duties on board. The crew complement exceeded the number of crew members listed in the Minimum Safe Manning Certificate. Apart from the chief engineer, who was from Azerbaijan, all the other crew members were Turkish nationals. The official communication language on board was English but the working language was Turkish.

The injured crew member was 33 years old. He was able to speak solely his native language (Turkish). He had been first employed at sea on 29 May 2012 and had served as an ordinary seaman solely on board *Hopa*.

1.4 Weather Conditions

According to the information obtained from deck logbook, the sky was partly cloudy and the outside temperature was 28°C, with a Northerly gentle breeze. The master recalled that the sea condition inside the port was calm.

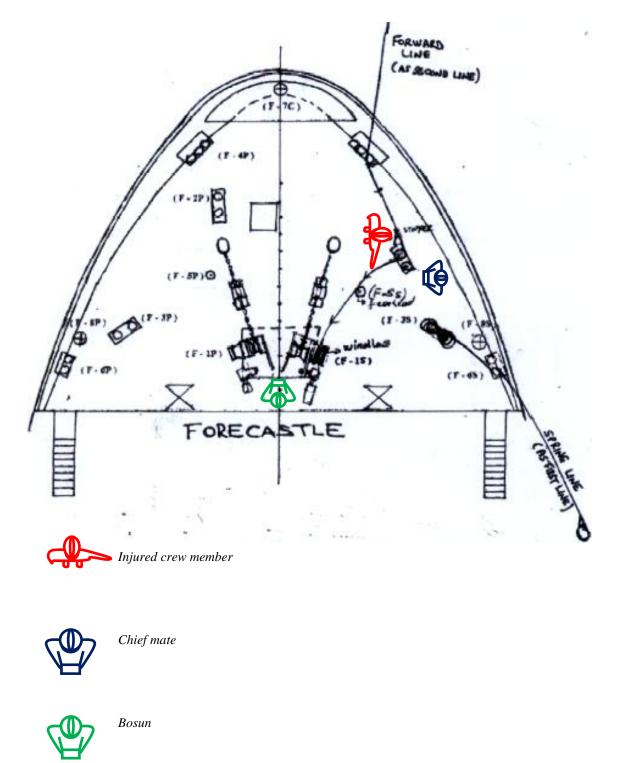


Figure 4: Crew members on forecastle deck at the time of the accident

1.5 Narrative¹

Hopa arrived at Caronte Roads, France on 16 February 2013 in order to load a cargo of scrap iron for Iskenderun, Turkey. As soon as the pilot boarded the vessel at 1116 and the tug line made fast through the Panama chock on forecastle deck at 1142, *Hopa* proceeded to her designated pier at the Port of Caronte in order to berth starboard side alongside².

As per Company's procedures, the forward mooring team consisted of the chief mate, who was responsible for the team, the bosun and one able seaman (AB). Prior to the berthing manoeuvre, the injured crew member had been instructed by the bosun to join the mooring team on the forecastle deck. According to the ordinary seaman (OS), this was his first time on the forecastle deck because since he had joined the vessel, he was always stationed at the aft mooring station. Although he was not willing to work on the forecastle, the OS complied with the bosun's instructions.

At the time of the accident, the forward windlasses were being operated by the bosun. The communication between the bridge and the forecastle deck was facilitated by means of hand held VHF receivers³.

As originally planned, the vessel took the tugboat's line through the forward centre chock. Thereafter, as a part of the berthing manoeuvre, *Hopa* dropped her port anchor and held two shackles in the water. One spring line was sent to the mooring boat by the injured crew member from the forward starboard side to transfer and make it fast on the shore bollards.

Concurrently with the forward mooring operation, another spring line was sent ashore from the poop deck. By 1205, the vessel had been moored with one forward spring line and one aft spring line. Subsequently, the pilot requested one headline to be sent ashore through the starboard bow fairlead and fastened at the pier bollard. From the

¹ Unless otherwise stated, all times in the report are local.

² During the course of the safety investigation, the injured crew member was also interviewed. He recalled the situation differently from the master, chief mate and the bosun. He claimed that the tugboat approached the vessel and fastened from the stern and not from the forward part. This conflicting evidence, however, did not have a bearing on the accident dynamics.

³ In addition to the hand-held VHF sets, the vessel had an interphone system fitted, which could be used for communication between the bridge and the mooring stations.

fairlead, the head line was passed in between the two pillars of the starboard forward bollards, to the rollers and onto the windlass' capstan.

According to the chief mate's advice, as soon as the head line was under tension, the OS applied a stopper line so that he could shift the head line and fasten it on the vessel's bollard. At this point in time, the chief mate noticed that the OS was not using the stopper line correctly. Specifically, the OS had fixed the stopper line very close to the bitt and did not allocate enough length for the application of the stopper line to hold the head line effectively. The chief mate cautioned the OS to ensure that the stopper line is well aligned with the mooring rope. The OS changed the position of the stopper line and led it closer to the mooring rope.

During this second application of the stopper line, the OS noticed that the head line was making a creaking sound indicating that it was very much under tension. At this instance, at about 1230, the head line jumped off the bitt and hit the OS (Figure 5) who, as a result of the impact, fell to his knees on the forecastle deck.



Figure 5: The head line arrangement at the bitts and the pedestal fairleads

The chief mate recalled that at the time of the accident, he was walking towards the bosun to determine whether the head line was excessively stressed. The bosun

reported that he could not see the OS as his line of sight was obstructed by the windlass.

Following the accident, the chief mate carried out a visual examination of the OS' condition and noticed he was severely injured. The OS was transferred to a safe area and the accident was reported to the master. The pilot was also informed of the accident and he communicated the matter to the shore authorities in order to provide medical assistance.

The mooring operations were resumed and the vessel was all fast at 1240. The final mooring configuration consisted of three head lines and two forward spring lines and three stern lines and two aft spring lines.

A medical first aid team boarded the vessel at 1250 and examined the crew member. It was confirmed that the OS required extensive medical treatment⁴ and general assistance was called on board, arriving at 1343.

Subsequently, the OS was transferred from the vessel to the hospital's ambulance at 1455.

⁴ The OS had suffered fractures to his left arm and both legs. Further detailed medical examinations in an Istanbul hospital confirmed that he had also fractured three right ribs.

2 ANALYSIS

2.1 Purpose

The purpose of a marine safety investigation is to determine the circumstances and safety factors of the accident as a basis for making recommendations, to prevent further marine casualties or incidents from occurring in the future.

2.2 Safety Management Procedures Related to Mooring Operations

As a general practice on board *Hopa*, officers do not print out individual checklists for each occasion. Rather, the instructions are available in placard forms and filled with a board marker accordingly.

Mooring operations were defined in the Company's SMS Manual (Chapter no. 4 -Arrival, Subparagraph S4.6.7 – Mooring). This part of the SMS Manual referred to checklist "SF4.7 - Mooring Check List". This checklist addressed the mooring plan, weather effect, underkeel clearance, means of communication on board, condition of mooring equipment and safety precautions (**Annex A**). Checklist SF4.7 provided clear instructions to the crew members to stand away from the winch drum and also from the mooring rope bight. During the MSIU's visit on board, the chief mate demonstrated the position of the OS at the time of the accident (Figure 6). It seemed evident that the OS had exposed himself to significant hazards and was not taking the necessary precautions. He was standing in the head line's snap back zone, at a time when the mooring rope was under tension.



Figure 6: The chief mate demonstrating the approximate position of the OS, moments before the accident

Considering that the OS lacked experience, Figure 6 also suggested that the other crew members on the forecastle deck did not caution the OS of the dangers of staying in close proximity of a mooring rope under tension, in all probability because they were busy executing their tasks.

Team work is central to most settings, including shipboard operations. There was no evidence to suggest that the OS was directed to stand in a hazardous position. Therefore, positioning himself in close proximity of a mooring rope under tension was a decision, which was not influenced by any other crew member. However, informational support *i.e.* advice from other crew members on the potential hazards of stressed mooring ropes, was not provided by any of the other crew members.

The lack of informational support impinged on the judgments made by the OS to position himself in a high risk zone, without recognising that a potential problem may have been created. Thus, the issue was not necessarily limited to one of compliance with Company procedures but also with operational (local) management in trying to anticipate (potentially) developing safety issues. As such, this does not reflect the true spirit of a strong safety management culture on board⁵.

2.3 Other Recorded Accidents and Safety Culture

According to the accident records available on board, covering the period between 2005 and 2013, a total of five accidents occurred on the vessel's forecastle and poop decks, resulting in various degrees of injuries. Between the same periods, four other accidents took place in different areas on board, resulting in minor injuries.

It was noticed that most accidents had neither been discussed nor evaluated properly by the vessel. Moreover, the section on 'actions taken' remained blank, without any suggestion / comment from the Management Company⁶.

⁵ This was also corroborated with other identified issues, although were not considered to have had an effect on the dynamics of this accident. For instance, other checklists, *inter alia*, the 'Pre-sail Navigation and Bridge Equipment Checks', the 'Navigation / Bridge Watch Keeping Checklist', the 'Pre-arrival Navigation Checklist', and the 'Anchoring Checklist' have been noticed to be either partially filled or completely blank.

⁶ A search in the MSIU and MSD databases revealed that only three accidents (including this one) had been reported between 2005 and 2013. On 18 May 2006, one of the lifeboats was accidently released during a flag State inspection, slightly injuring one of the inspectors. On 31 March 2009, the vessel sustained main engine problems and had to drop anchors to make the necessary repairs.

The lack of accident follow-up may be viewed from (at least) two perspectives -a snapshot of the safety culture on board and the potential lessons which had been missed, not least in those accidents related to mooring operations.

The safety culture of an organisation is defined as the product of the individual and group values, attitudes, competencies and patterns of behaviour that determine the commitment to an organisation's safety programmes. Given that all causal factors, including technical factors identified in an accident causal analysis, have the potential to be examined, the importance of a safety culture on board and ashore is crucial in order to ensure that the Company's safety programme evaluates those factors contributing to the accident.

Unless analysed, the management would not be in a position to identify and work on the social actors involved, the relationships among them and the reasons for the accident. The scope is to identify motivation source-type problems and specific organisational controls that would have broke down and led to the accident.

In the absence of such activity (as this safety investigation has identified), the Company and the ship have not only missed opportunities to avoid repeat accidents, but have also limited the contribution to advance the cultivation of a safety culture. In other words, the Company remained oblivious to the 'position' of the safety boundaries on board the ship.

The absence of such activity is suggestive of a safety management system which is not working at its full potential to identify and address risk – even from the legal perspective given that there is an obligation on the Company to conduct internal investigation into these occurrences, in accordance with Section 9 of the ISM Code.

2.4 Pre-joining and on Board Training

According to on board training records, the injured crewmember had been provided familiarisation training between 30 May and 04 June 2012. This had been verified by the OS himself when he was interviewed at the hospital. A Pre-joining Training Checklist was also provided to the MSIU. The document indicated that injured crew member had been trained at the Company's office for one day, before joining the

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vessel. The checklist indicated that during his training ashore, the crew member had been informed of specific tasks related to the implementation of the ISM and shipboard specific tasks (**Annex B**).

This, however, was not corroborated with what the OS had to declare. During the interview session in hospital, the injured crew member reiterated that not only did he not receive any training ashore, but he had neither seen nor signed the document during his visit to the Company's office.

Whilst it is unclear for the safety investigation as to which version was accurate, the limited experience of the injured crew member, the inadequate use of the stopper line and his position inside the snap back zone were indicative that he was not sufficiently trained as far as mooring operations and related risks were concerned.

2.5 Improper Handling of Mooring Ropes

It is normal on board ships to have the pedestal fairleads and the bitts of different heights. Moreover, the rollers on board *Hopa* were closely fitted to the bitts. There is also a normal height difference between the top cap of the bitts and the rollers.

This height difference between different mooring equipment contributed to an angle of the mooring rope under tension when it was run straight from the bitts to the rollers (this was the arrangement at the time of the accident) (Figure 7).



Figure 7: Different heights of mooring equipment on the forecastle deck (red line indicates the resulting angle of the mooring rope)

With this angle, a mooring rope under tension would create a vertical component of force that would displace the rope upward, potentially resulting in the mooring rope slipping off the bitt. Other alternative arrangements, such as the one represented in Figure 8, could have prevented the mooring rope from slipping the bitts.

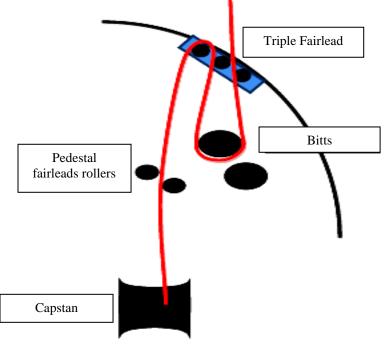


Figure 8: An alternative mooring arrangement

Although not adopted, the arrangement would have necessitated the mooring rope to run from the fairleads to the bitts, back to fairleads and then to the capstan through the rollers.

THE FOLLOWING CONCLUSIONS AND RECOMMENDATIONS SHALL IN NO CASE CREATE A PRESUMPTION OF BLAME OR LIABILITY. NEITHER ARE THEY BINDING NOR LISTED IN ANY ORDER OF PRIORITY.

3 CONCLUSIONS

Findings and safety factors are not listed in any order of priority.

3.1 Immediate Safety Factor

.1 The immediate cause of the accident was the angle taken by the mooring rope running straight from the bitts to the rollers, creating a vertical component of force that displaced the rope upwards off the bitts and hitting the crew member.

3.2 Latent Conditions and other Safety Factors

- .1 The crew member exposed himself to significant hazards by standing in the snap back zone of a mooring rope under tension;
- .2 The crew member did not benefit from informational support as none of the other crew members advised him of the hazards to which he was being exposed;
- .3 The crew member lacked the necessary knowledge to work safely in close proximity of mooring ropes under tension.

3.3 Other Findings

.1 Although this was not the first mooring accident to happen on board this ship, evidence indicated that these were neither followed thoroughly nor addressed in accordance with the requirements of the ISM Code.

4 RECOMMENDATIONS

In view of the conclusions reached,

Selkar Gemicilik A.S., Turkey is recommended to:

- 07/2014_R1 revisit its training procedures related to safe working practices on board, with special emphasis on mooring rope operations;
- 07/2014_R2 take actions at Company level to ensure that the requirements of the ISM Code, in particular Section 9 are adhered to and complied with;
- 07/2014_R3 take actions at Company level to ensure that all casualties and incidents are reported to the flag State in accordance with the relevant national legislation.

ANNEXES

Annex A Mooring Checklist

SF4.7	MOORING CHECK LIST (POSTER)27.02.	2013
Company Name	SELKAR GEMICILIK A.Ş İSTANBUL	Version
/dssci: M / V I	ISKENDER	UN
Curl .	MOORING PLANNING	
		Maste
s mooring plan Flot instruction	properly completed taking into account the local weather/current conditions and s ?	1
lave the 'wind j	gradient effects' been estimated ?	1
	el clearance effect' been estimated ?	1
the local distance of the local distance of the	in between bridge and mooring stations checked ?	2
	ines and winches been checked ?	
the second s	es reeled on the drums in the correct direction ?	5
	fram, have officers instructed to keep only one layer of line on the working drum?	
in case of self te	maioning winches, have the officers instructed not to use the winch automatic vessel is moored ?	1
Have officers in material and ela	structed not to use together and in the same direction mooring lines at different sticity ?	1
Are there any o	ostacles restricting movement fore and aft ?	1
Are fenders ava		
	CHECKING MOORING EQUIPMENT AND ROPES	
Have winches a	nd brake linings been checked ?	Duty
		Officer
 Brake linin 	gs drum condition	-
 Linkages 		Strength Strength
	oil or steam leaks	
	s been checked for:	
	/ broken strands	-
	d changes in diameter	1
Abrasion		
Maintenan		4
 Futigue bri Huve steel wire 		-
Have synthetic	is been removed from drum for inspection / greasing ? fibre ropes been checked for:	
· Escessive	were (powdering, elongation)	1
· Security o	fatranda	1
 Abrasion 	and the second sec	1
 Hockling 		9,
 Chemical 	/ heat damage	1
-	MOORING OPERATION	1
Are recomment	atations for operating winches / brakes being observed ?	11
Are recommen	idations for incoring ropes being observed ?	-
A sea of the second second	cautions for mooring party being observed ?	
Are safety pre	A MARTIN AND AND A MARTIN AND A MARTIN AND A MARTIN AND A MARTINA AND A MARTINA AND A MARTINA AND A MARTINA AND	-
 Are safety pre Standing 	away from which dram away from the bite of wire f repe	



Annex B Company's Pre-joining Training Checklist

