Isle of Man Ship Registry

Casualty Investigation Report No. CA 114

M/V ELBE MAX

MAN-OVERBOARD FATALITY

17 February 2011

Statement of Intent

Extract from the Isle of Man Merchant Shipping (Accident Reporting and Investigation) Regulations 2001, Regulation 4

"*The fundamental purpose of investigating a casualty, an accident, or an incident under these Regulations is to determine its circumstances and the causes with the aim of improving the safety of life at sea and the avoidance of accidents in the future.*

"It is not the purpose to apportion liability, nor, except so far as is necessary to achieve the fundamental purpose, to apportion blame."

Contents

List of Abbreviations

Symbol	Meaning
GT	Gross tonnage
090°T	True heading
IMO	International Maritime Organisation
MSC	The IMO's Maritime Safety Committee

Vessel Particulars

Registered owner	Waxstone Shipping Inc.
Manager (ISM Code 1.1.2)	Enterprises Shipping & Trading S.A.
Classification society	Bureau Veritas
IMO number	9171278
Port of registry	Douglas
Flag administration	Isle of Man
Ship type	Bulk Carrier
Keel laid date	26 January 1999
Call sign	MGUS9
Builder	Hyundai Heavy Industries, Ulsan, Korea
Construction	Steel
Registered with Isle of Man	8 March 2005
Class society	Bureau Veritas
Registered length	218.695m
Gross tonnage	38,972
Net tonnage	24,407
Main engine	Hyundai-MAN-B&W 5S60MC, MCR 9603kW
Auxiliary engines	3x 625kVA
Auxiliary boiler	1x CHM-Kangrim

Summary

The motor vessel Elbe Max is a 38,972 GT bulk carrier operated by Enterprises Shipping & Trading S.A. of Piraeus, Greece. On the morning of 17 February 2011, while on passage from Newport News, USA to Hamburg, Germany, the Master authorised the chief officer to assemble a team to clear mooring lines from the aft deck. Due to the recent heavy weather and the presence of green water on the deck, two mooring lines had shifted from their stowed positions against the aft bulkhead of the engine casing and were in danger of being washed overboard where it was feared they might foul the propeller.

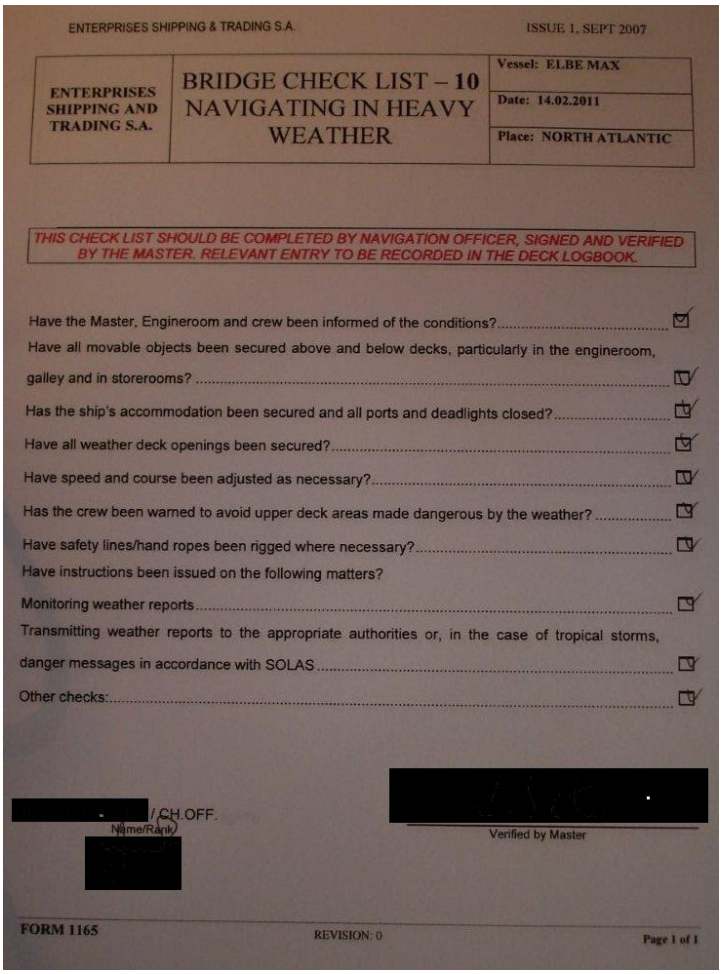
The chief officer assembled a team of eight to assist with clearing the lines. While the team was engaged in working, the deck became engulfed with green water from two successive large waves which struck working crew members causing some to lose their footing, one of whom was washed overboard and subsequently was not recovered.

The vessel was attended in Hamburg by surveyors from the Isle of Man Ship Registry to determine the causes of this very serious casualty.

Narrative of Events

EVENTS PRIOR TO THE INCIDENT

On 12 February 2011, the vessel departed from Newport News with a full cargo of coal in all cargo holds. Over the next few days, the vessel encountered some severe weather. Prior to the casualty, a 'Heavy Weather checklist' was last completed on 14 February 2011. The Master's response to the prevailing weather included prohibiting crew members from venturing out on deck. Lifelines were not rigged as it was not envisaged that any crew member would be required to undertake work outside.



ENTERPRISES SHIPPING & TRADING S.A. ISSUE 1, SEPT 2007

ENTERPRISES SHIPPING AND TRADING S.A.	BRIDGE CHECK LIST – 10 NAVIGATING IN HEAVY WEATHER	Vessel: ELBE MAX Date: 14.02.2011 Place: NORTH ATLANTIC

THIS CHECK LIST SHOULD BE COMPLETED BY NAVIGATION OFFICER, SIGNED AND VERIFIED BY THE MASTER. RELEVANT ENTRY TO BE RECORDED IN THE DECK LOGBOOK.

Have the Master, Engineroom and crew been informed of the conditions? ☑
Have all movable objects been secured above and below decks, particularly in the engineroom, galley and in storerooms? ☑
Has the ship's accommodation been secured and all ports and deadlights closed? ☑
Have all weather deck openings been secured? ☑
Have speed and course been adjusted as necessary? ☑
Has the crew been warned to avoid upper deck areas made dangerous by the weather? ☑
Have safety lines/hand ropes been rigged where necessary? ☑
Have instructions been issued on the following matters?
Monitoring weather reports ☑
Transmitting weather reports to the appropriate authorities or, in the case of tropical storms, danger messages in accordance with SOLAS ☑
Other checks: ☑

[redacted] / CH.OFF.
Name/Rank
[redacted]

[redacted]
Verified by Master

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'Navigating in Heavy Weather' checklist

Three mooring lines were stowed on wooden pallets adjacent to the port side of the aft bulkhead of the engine casing in accordance with common practice on board this vessel. Lines were secured in place using lashing ropes attached to adjacent piping and to steel lugs temporarily welded to the deck, a 'herring-bone cage' pattern of lashings being reportedly typical. It was stated that lashing ropes do not pass through coils' centres.

Aft deck mooring lines - stowage location looking to starboard. Provision of temporary lugs and lashing ropes not shown.
(photographs taken post incident)

Aft deck mooring lines - stowage location looking to port

On 16 February, it was noted that one of the vessel's aft mooring lines had become partially detached from its poop deck stowage position.

Loose mooring lines – photograph taken by crew on 16 February

The Master discussed the situation with the chief mate and bosun on the wheelhouse. The chief mate was instructed by the Master to assemble a team, go out onto the aft deck and clear away the loose mooring lines.

A deck party thus organised by the vessel's chief mate succeeded in stowing the rope below deck in the aft rope store. Remaining mooring lines stowed on the aft deck were noted to be securely lashed in place and were not considered to be in danger of shifting. Additional lashing ropes were however placed around these lines. It was noted that no Job Hazard Analysis and associated risk assessment was prepared prior to this work being carried out.

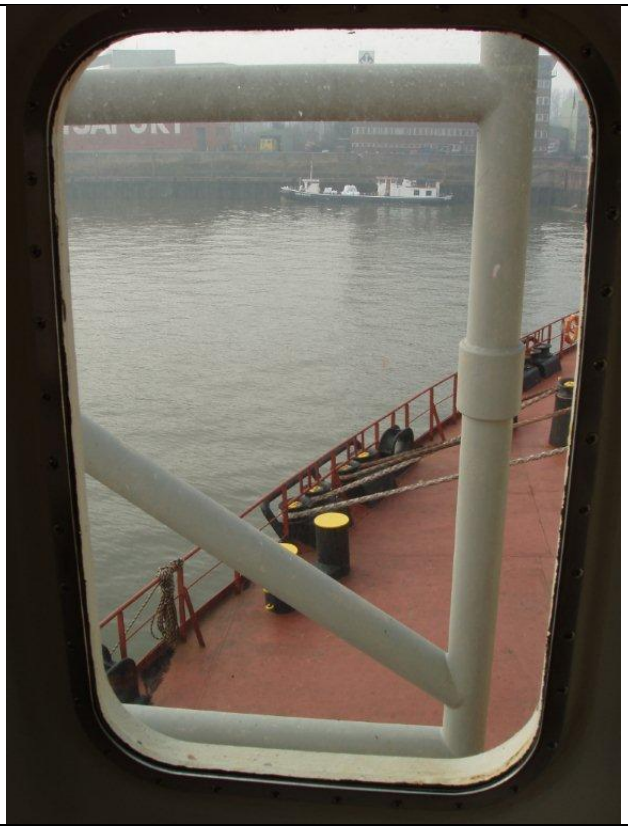
NARRATIVE OF EVENTS AS REPORTED, 17 February 2011

The chief officer began his duty as wheelhouse watch-keeping officer at 0400 (all times are local ship's time on board). An AB was on duty as helmsman. The sun rose at 0640 and the day continued bright. Weather conditions were otherwise poor with wind force 6-7 and high seas of 7-9m. Seas were reportedly not breaking over the aft deck at this stage. The vessel was proceeding on a course of 090°T, having changed heading from its previously planned route to ease the vessel's movements. Following seas and swell were observed meeting the vessel from astern and from the port quarter. The vessel was experiencing severe pitching but limited rolling.

A photograph of chart BA Chart 4404: Gulf of Maine to Strait of Belle Isle including Gulf of St. Lawrence showing the vessel's intended course prior to the incident taking place. Chart reproduced by kind permission of UKHO

0700: The chief officer noted from the starboard bridge wing that mooring lines were lying on the aft deck, having become detached from their stowage positions. Concerned that the lines might wash overboard, foul the propeller and thereby endanger the vessel, he contacted the Master using the vessel's internal telephone system and requested the Master come to the wheelhouse. He contacted the bosun by the same method, asking him to attend the wheelhouse also.

0705-0715: The Master arrived at the wheelhouse and was apprised of the situation by the chief officer. The need for immediate action in view of the forecasted deterioration of sea and weather conditions was agreed. On his arrival, the bosun was advised as necessary and was requested by the chief officer to assemble a team to assist with clearing and re-stowing the mooring ropes. He was further advised to consider the experience of each seafarer in determining their exposure to the risks envisaged. In view of the following seas, the third officer was awoken and was instructed by the Master to go to the officers' mess room where the Master was of the opinion that the third officer could best observe incoming seas and warn the deck team of any danger in advance.



A photograph of the view of the aft deck, starboard side, from the officers' mess room aft windows showing the limited field of vision possible from this position, particularly of the aft deck's port quarter

Contrary to company procedures, a Job Hazard Analysis was not completed at this time and no risk assessment was drafted or referred to. Beyond agreeing a general plan that the mooring lines be disentangled and re-stowed adjacent to the starboard lifeboat davit on A-deck, the method by which the ropes were to be dealt with was not discussed and individuals' duties and responsibilities were not explained or allocated, it being concluded by all parties that the scale of the problem, and its solution, would become clear once the situation had been assessed on-site.

0715-0730: the deck team of eight persons assembled first in the upper deck ship's office and later in the gymnasium, this space being situated on the main deck adjacent to the accommodation aft bulkhead. A door from the gymnasium exits onto the transverse passageway between accommodation block and engine casing.

The assembled team was made up of the following crew members. Numbers, as applicable, were taken from the vessel's Isle of Man List of Crew, this document being allied with the Isle of Man Official Log Book:

- Chief officer
- Bosun
- AB 10
- AB 11
- AB 12 (the deceased)
- OS 13
- OS 14
- Deck cadet 21

Again, it was reported that there was little or no discussion of ways and means by which the work would be completed. The chief officer satisfied himself that all members of his party were dressed as necessary in work clothing which he considered suitable for the conditions. Some crew members were wearing hard hats, some wearing woolly hats.

The chief officer confirmed that all crew members were equipped with lifejackets. Three different types of lifejacket were reportedly in use, only one of which was of a SOLAS-compliant type which enables the wearer to float unconscious in the water with his head supported above the surface. The remaining types of lifejacket were of the 'vest' type consisting of buoyancy distributed around the torso only, no support being provided for the head.

A photograph showing one of the accident investigators wearing two types of 'vest' lifejackets reportedly worn by deck crew members on the morning of the incident

Three members of the deck party were equipped with VHF radios, including the chief officer and the bosun.

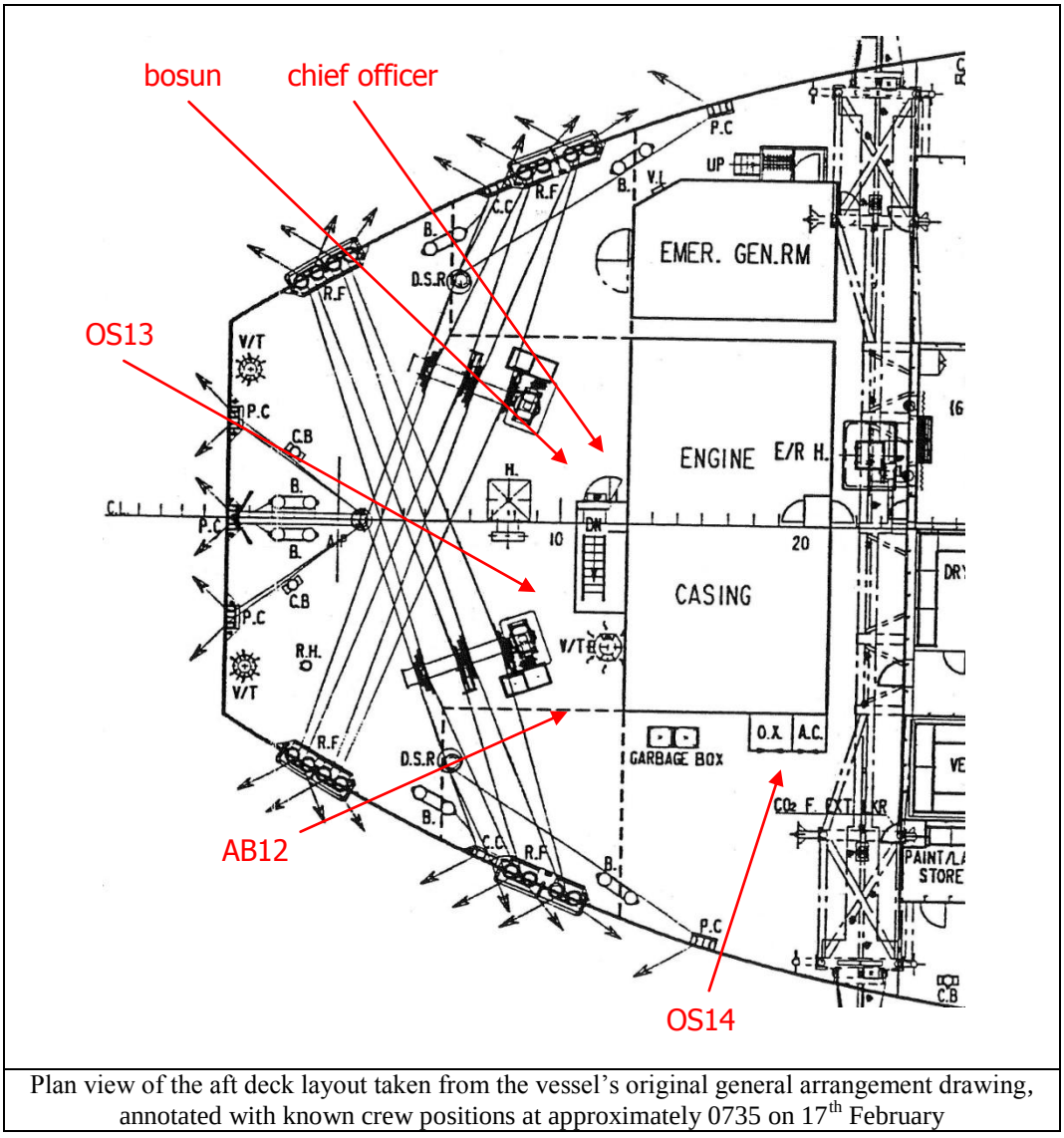
0730-0735: before emerging from the gymnasium to the aft deck, the chief officer advised the Master by radio of his team's readiness. The Master again advised the chief officer to take care on the open deck in view of the prevailing sea conditions. The third officer, in position at the officer's mess room aft windows reported all was clear.

The bosun and chief officer were the first to emerge from the gymnasium to the athwartship passageway between engine casing and accommodation aft bulkhead. After clearing some loose dunnage which was blocking their route to the aft deck, the bosun and chief officer noticed that the hinged rail section of the aft starboard bulwark was open, having apparently been struck by a loose pallet. The hinged section of bulwark rail was slightly deformed. The bosun proceeded to close and secure the hinged rail section as best he could.

A photograph of the aft starboard hinged rail section showing deformation reportedly caused by the loose pallet

The rest of the deck team then emerged and began work clearing the mooring lines which were found twisted together and entangled around various parts of the aft deck including a lighting support bracket on the engine casing aft bulwark. The chief officer continued in overall charge of the work. He directed deck cadet 21 and OS 14 to stand on 'A' deck, aft of the starboard lifeboat davit, ready to receive the mooring ropes passed up to them by the aft deck party. The aft deck party continued the process of untangling the lines. The chief officer positioned himself adjacent to the steering gear flat entrance door, his radio in his hand, his attention being divided between monitoring and assisting with the work in progress and watching the sea state. At around 0735, the bosun and OS 13 were working within a few metres of the chief officer, the bosun and OS 13 being closer to the starboard winch. AB 12 was standing approximately equidistant between the starboard winch and the starboard bulwark.

The vessel's stern



Plan view of the aft deck layout taken from the vessel's original general arrangement drawing, annotated with known crew positions at approximately 0735 on 17th February

Finding the need for additional hands, the chief officer instructed the two crew members (deck cadet 21 and OS 14) stationed on 'A' deck to descend to the main deck to assist. The crew members were half way down the stairway when, at approximately 0735, a shout was heard warning that a wave was about to strike the deck. It remains not clear from where this warning came. On hearing the warning, crew members on the aft deck instinctively clung on to anything within reach as two large waves in succession struck the vessel from the direction of the aft port quarter. Both waves reportedly engulfed the deck to a height of between 1.5 and 3m. Several crew members were washed off their feet, two of whom were pushed against the aft starboard railings and one of whom, AB 12, was washed overboard. The bosun advised that he saw AB 12 washed overboard by the first wave.

The chief officer was able to cling on to piping adjacent to the steering gear flat entrance door. The bosun lost his footing and was washed against the starboard railings becoming entangled in the mooring lines. The crew member working closest to the chief officer's position, OS 13, was reportedly flung up into the air by the force of the wave, landing on top of the starboard winch when the water receded. Crew members descending from A deck rapidly ascended the stairway back up to A deck. The remaining crew members on the

starboard side of the engine casing were able to cling on to railings or handholds while the water receded.

'Man-overboard' was reported by radio to the Master by the third officer, reportedly on seeing the bosun on the aft deck mouth the words.

The aft deck starboard side

0735-2200: on hearing the MOB warning shout, the Master instructed the helmsman to turn the wheel hard-a-starboard (a Williamson turn was not attempted in view of the prevailing weather) then hurried to the starboard bridge wing and released the lifebuoy stowed there. This lifebuoy was attached to a self-activating smoke and light signal. No crew member was able to confirm seeing smoke emanating from this signal following release. On re-entering the wheelhouse, the Master pressed the general alarm to alert all crew to the emergency and made an announcement on the public address system. He made a note of the ship's position but did not press the 'MOB' button on the vessel's GPS.

The remaining deck crew members meantime hurried to assist their fellow crew members injured during the incident and to bring them within the accommodation. Two crew members remained on A deck adjacent to the starboard lifeboat attempting to locate AB 12 in the water.

The vessel completed a full 180° turn and several crew members noticed passing by the starboard bridge wing lifebuoy floating on the vessel's starboard side, no more than 8m from the vessel, within approximately 15 minutes of the loss of AB 12. No sign was noted of the lost crew member. The vessel's wheelhouse remained manned with all available lookouts during the entire day.

In view of the heavy swell, and thus the difficulty likely to be experienced with recovery, the Master decided not to attempt lowering the vessel's lifeboat to assist with search operations.

The Master first contacted Canadian Coast Guard's Maritime Rescue Sub-Centre at St John's (MRSC St John's) by Inmarsat C telephone at approximately 0740 to report the accident and

to request immediate assistance with searching for the lost crew member. MRSC St John's referred the Master's request to the USCG's RCC Norfolk which assumed overall command of the rescue operations from that point onwards. A 'pan pan' urgency call from the Elbe Max was picked up by the tanker British Esteem which immediately turned around and commenced assisting with search operations in co-operation with RCC Norfolk. The Master also advised the vessel's management company of the incident. The Elbe Max commenced searching, following patterns advised by RCC Norfolk. Sea conditions reportedly continued to deteriorate during the day.

The British Esteem reported sighting the Elbe Max's lifebuoy during their search but the missing crew member was not seen.

Two USCG airplanes joined in the search, turn by turn during the day.

At 1800, RCC Norfolk released the British Esteem from the search operation. At 2200, RCC Norfolk released the Elbe Max from search operations, all hope of finding the missing crew member having been lost. Elbe Max then resumed its voyage to Hamburg.

The vessel berthed in Hamburg at 0200 on 1 March 2011. Two crew members who were still suffering from residual minor injuries and bruising were taken to hospital for medical examination.

Comment and Analysis

1. Working on deck in heavy weather is hazardous. Crew members were required to access the weather deck of the Elbe Max on the morning of 17 February due to the presence of loose mooring lines on deck which were in danger of fouling the vessel's propeller. Had mooring lines been effectively secured on deck, or had they been stowed below deck within the rope locker provided on departure of the vessel from Newport News, there would have been no necessity for crew members to expose themselves to the dangers of the open deck.

   It bears mentioning that, had *all* mooring lines on the aft deck been stowed below deck on the 16th February, including the mooring lines which remained secured in the deck stowage positions, there would have been no necessity for the crew to access the open deck again on the morning of the 17th.

2. The statutory requirement for companies to assess risks has been mandatory since the inception of the ISM Code. This requirement was clarified by MSC Resolution 273(85). Subsequent amendments to the ISM Code entered into force on 1 July 2010 which require companies to identify all risks to their ships and to establish appropriate safeguards.

   In reflecting these mandatory requirements, Enterprises Shipping & Trading SA has adopted a Job Hazard Analysis procedure. This procedure includes a number of standard risk assessments and also provides guidance to crew with regard to the drafting of job-specific risk assessments where unusual and potentially dangerous activities are required of crew.

   Despite the company having provided documented procedural stipulations to the contrary, a Job Hazard Analysis was not completed prior to the team going out onto the aft deck to clear the loose mooring ropes on the morning of 17 February. Verbal discussion of the risks, and in particular the means by which such risks might be *mitigated*, was limited to the posting of a look-out (in a position where his view was restricted), consideration of the experience of each seafarer in determining their exposure to the risks envisaged, the use of (in some cases inadequate) personal life-saving equipment, and the Master's repeated warnings to the team to exercise vigilance in view of the prevailing conditions. At no stage was the use of safety harnesses and lifelines considered, despite such equipment being readily available on board. Even for the task of securing the open bulwark hinged rail section, the bosun did not make use of a harness and lifeline. During interview, crew members were of the stated opinion that the wearing of lifelines would limit freedom of movement on the deck and effectively make the task impossible.

During interview, the Master made it clear he would have welcomed receiving more training in the company's risk assessment procedure. The Master had joined the vessel on 25 January 2011 and had rejoined the company only a short time previously.

During interview, some crew members suggested that time taken drafting risk assessment paperwork would have meant further delay to the completion of the urgent work required.

3. Harnesses on board were understood to be distributed between the stores space adjacent to the engine room workshop and the deck house forward – a space which would not have been safe to access without the provision of fixed lifelines – lifelines which would not have been safe to rig in the prevailing conditions.

4. Lifejackets worn by crew members on deck included several different varieties, some of which were in a poor state of repair. Some jackets reportedly used during the accident were not of a type approved in accordance with the LSA Code. The use of 'vest' type lifejackets is common on board vessels while crew are engaged in working from small boats alongside and in harbour, their use is not recommended in open water where the risk of the wearer becoming unconscious either during a fall into the sea or subsequently due to exposure is so much greater. 'Vest' type life jackets are not designed in accordance with the IMO's LSA Code which makes reference to compliance with MSC 81(70) and thus are not required to be designed to assist an exhausted or unconscious swimmer to adopt a stable face-up position. In addition, 'vest' type life jackets commonly provide a lower level of buoyancy (100-150N) compared with 200-275N commonly provided by life jackets approved in accordance with the LSA Code.

5. Wheelhouse 'Navigation in Heavy Weather' checklist includes the question, 'Have safety lines/hand ropes been rigged where necessary?' It is noted that no lifelines were rigged on deck that day on the assumption that crew would not be required to access open decks.

6. Despite there being such concern over the sea state during the work on the aft deck that all crew members were instructed to wear life jackets, at no stage was the donning of immersion suits considered. Clothing worn was reportedly of a variety of types, none of which was likely to provide the wearer with an increased chance of survival in cold water in the event he was washed overboard, nor was clothing uniformly of bright colours likely to assist with identification following loss of a crew member overboard.

7. The third officer was instructed by the Master to watch for heavy seas from the officers' mess room windows, partly because the Master was of the stated opinion

that the third officer might not be able to hear his VHF radio clearly if he were stationed on the open deck. From this vantage point however, the third officer's view of the port quarter, the direction from which waves were most often meeting the vessel, was restricted – waves could not be seen from this position until very shortly before they struck the vessel. Positioning a lookout within the crew mess room on the port side of the vessel, from which a view of the prevailing sea conditions would have been better, was not considered.

8. AB 12 was reportedly a good and reliable worker, was in good spirits that morning and did not appear to be under the influence of alcohol or narcotics.

9. In common with most vessels of this type, dedicated attachment points for the rigging of lifelines on the vessel's weather deck are fitted forward of the accommodation block. No dedicated lifeline attachment points are provided in the aft deck area.

10. The smoke & light signal attached to the wheelhouse lifebuoy was not observed to emit smoke or light by any crew member - neither shortly after the incident nor when the vessel had completed its turn and the lifebuoy was sighted once more. Lifebuoy smoke signals are required to be designed to comply with the LSA Code Ch.II, section 2.1.3 which stipulates that smoke shall be released for a period of not less than fifteen minutes. Self-activating lights are required to function for a minimum period of two hours.

11. Crew certification was reviewed. All members were found adequately qualified and medically fit for their respective roles on board.

12. Fatigue was not considered to be a contributory factor in this casualty, nor was the consumption of alcohol.

13. Once it was realised that a crew member had been washed overboard, actions taken by all those on board were exemplary. Communication among crew within the vessel, between the vessel and the relevant emergency services, and between the vessel and its management company, was rapid, effective and professional.

Recommendations

Enterprises Shipping & Trading is recommended to:

- Forward pertinent details of this incident to vessels within its fleet. By this means the importance of drafting formal risk assessments prior to undertaking potentially hazardous activities may be properly illustrated.
- Amend procedures to require that all mooring lines be stowed below decks during long passages and most particularly when there is a risk that the vessel may encounter heavy weather.
- Consider amending its procedures/standard risk assessments' recommendation to include consideration of the rigging of life lines on deck prior to entering heavy weather. Stowage locations for lifelines and harnesses should be considered with regard to their accessibility during heavy weather.
- Encourage Masters and chief officers serving on board its vessels to take ownership of tasks for which standard risk assessments have not been drafted by the company and in so doing consider how the dangers associated with the specific task may be effectively mitigated. The competence of Masters within the fleet in completing risk assessments for non-standard procedures may also need to be considered and additional training carried out as necessary.
- Consider drafting a standard risk assessment for use by vessels within its fleet detailing what measures are to be considered in order to mitigate the risks to crew on accessing open decks in heavy weather. Due regard may be given to advice contained within the Code of Safe Working Practices and within section 16 of IMO MSC Circular 1143 (Guidelines on early assessment of hull damage and possible need for abandonment of bulk carriers), section 16.
  The provision of such a standard risk assessment would mean that the completion of the relevant paperwork might impact minimally upon the speed with which urgent work may be completed.
  Such mitigation measures should include consideration of the following:
  - The wearing of lifejackets of appropriate types
  - The wearing of immersion suits in the event sea temperatures present a risk of exposure in a man-overboard situation
  - The use of harnesses together with fixed lifelines
  - The provision of additional temporary lifelines in way of areas of the deck not provided with fixed attachment point (i.e. aft deck)
- Consider encouraging Masters to include within the vessel's scheduled training routines exercises relevant to deck activities in heavy weather, exercises which should include the wearing of harnesses attached to strategically-placed lifelines in order to familiarise crew with the difficulties inherent in undertaking tasks on deck while so encumbered.
- Issue fleet instructions regarding the method by which mooring lines are to be secured for ocean crossings particularly when heavy weather is expected, either by:
  - More effective securing on deck
  - Stowage of mooring lines under deck in forward and aft stowage spaces.
- Consider the replacement of the make/type of smoke & light float found on board Elbe Max and on other vessel's within its fleet following consultation with the manufacturer.