Report on the Investigation of the

lifting appliance accident on board

BBC Atlantic

alongside in the port of Antwerp, Belgium

resulting in one fatality

19th October 2008

Gibraltar Maritime Administration
Watergate House
2 /8 Casemates Square
Gibraltar

Extract from

The Gibraltar Merchant Shipping

(Accident Reporting and Investigation)

Regulations 2006 – Regulation 5:

"The sole objective of the investigation of an accident under these regulations shall be the prevention of future accidents through the ascertainment of its causes and circumstances. It shall not be the purpose of an investigation to determine liability nor, except so far as is necessary to achieve its objective, to apportion blame."

NOTE

This report is not written with litigation in mind and, pursuant to Regulation 13(10) of the Gibraltar Merchant Shipping (Accident Reporting and Investigation) Regulations 2006, shall be inadmissible in any judicial proceedings whose purpose or one of whose purposes is to attribute or apportion liability or blame unless a court or tribunal having due regard to relevant factors determines otherwise.

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AB	-	Able Seaman
C/O	-	Chief Officer
GL	-	Germanischer Lloyd
OS	-	Ordinary Seamen
SWL	-	Safe Working Load
Vhf	-	Very high frequency
T – hook	-	Type of lifting appliance loose gear used where the loose gear fits underneath the load and the load is transferred to the lifting appliance by the upper contact surface of the loose gear.

All times used in this report are local time (UTC + 2)

SYNOPSIS

.1 On the 19th October 2008, the general cargo vessel BBC Atlantic was alongside in the port of Antwerp, Belgium. The loading of cargo was commenced early morning and after approximately four hours the Chief Officer (C/O) advised the Master of the completion of cargo into No.1 lower cargo hold and proceeded to commence the closure of the tween deck hatch covers.

.2 The tween deck hatch covers were being moved using the forward cargo crane with four wire slings attached via T hooks to four lifting points on the top of the hatch cover, the wire slings then being attached to the central hook of the cargo crane.

.3 The C/O was standing on the hatch cover and giving direction to the AB who was operating the controls for the cargo crane, following an order to hoist and move the hatch cover aft the T hooks at the aft most side of the hatch cover were seen to release, quickly followed by the T hooks at the forward side. The C/O and the hatch cover then fell to the bottom of the cargo hold with the C/O sustaining fatal injuries.

SECTION 1 – FACTUAL INFORMATION

1.1 PARTICULARS OF BBC ATLANTIC AND ACCIDENT

Vessel Details

Registered Owner	:	Briese Schiffahrts GmbH & Co. KG MS 'WESTERRIEDE'
Managers	:	Briese Schiffahrts GmbH & Co. KG
Port of Registry	:	Gibraltar
IMO No.	:	9352743
Type	:	General Cargo
Built	:	2005 Tianjin Xingang Shipyard, P.R. China
Classification Society	:	Germanischer Lloyd
Construction	:	Steel
Length Overall	:	115.5m
Gross Tonnage	:	5261
Engine Power	:	3840 KW
Service Speed	:	13.0 Knots
Hatch Cover Gantry Crane Manufacturer	:	Mariner Ships Equipment, Tuzla, Istanbul, Turkey

Accident Details

Time and date	:	10:03 on 19 October 2008
Location of accident	:	No. 1 Cargo Hold Tween Deck whilst the vessel was alongside at Antwerp, Belgium
Persons on board	:	12 Crew
Injuries / Fatalities	:	Chief Officer fatally injured
Damage	:	Port and Starboard longitudinal cargo hold bulkhead punctured and indented

2 NARRATIVE

2.1 Chronology of the Accident

18/10/08 **22:42** Vessel alongside port of Antwerp, starboard side against quay.

23:30 C/O joins vessel.

19/10/08 **06:10** Cargo loading commenced using shore cranes into number 1 forward cargo hold tank top.

08:00 C/O commences work duties.

09:50 Loading of cargo into number one lower cargo hold completed and C/O advises the master via vhf of the completion of cargo and the intention to commence the closure of the tween deck hatch covers.

10:03 C/O and OS connect the lifting slings attached to the forward cargo crane to the tween deck hatch cover using the T hooks, the C/O is observed by the OS to check the attachments and re-adjust one attachment, the OS is told to leave the cargo hold and proceed aft to disconnect the hatch cover following the intended movement.
C/O remains on the hatch cover standing toward the forward starboard side holding the lifting sling at that location, a hoist order is given by the C/O to the crane driver, followed by an order to move the hatch cover aft.
The hatch cover was observed by the crane driver to have moved approximately 0.5 meters aft when the T hooks at the aft side were seen to release, followed very quickly by the T hooks.
The C/O and the tween deck hatch cover fall with the hatch cover landing on top of and fatally injuring the C/O.

10:05 Master proceeds from the bridge to the cargo hold with the port captain, emergency services are called, followed by the company and port authorities.

10:20 Emergency ambulance and police board the vessel, the emergency ambulance staff verbally confirm that the C/O is deceased.

11:00 Doctor boards the vessel, emergency ambulance departs, doctor certifies C/O as deceased.

2.3 Lifting Appliance Configuration

.1 Vessel is a multi-purpose cargo ship with two cargo holds separated by a transverse cargo hold bulkhead; each cargo hold has tween deck pontoon hatch covers affixed directly to the sides of the cargo hold. The vessel is designed for the carriage of containers in both the cargo hold and on deck with container castings welded into the top of the hatch covers to serve as locking points for the containers.

.2 The vessel has two pedestal cargo cranes on the port side with a variable safe working load (SWL) based upon radius of 35 tonne up to 24 meters and 60 tonne up to 14 meters. The vessel is equipped with a hatch cover gantry crane intended to be used for the movement of the tweendeck hatch covers and cargo hold grain bulkhead with a SWL of 19 tonne.

2.4 Lifting Appliance Certification

.1 The cargo cranes were manufactured in accordance with drawings approved by the vessels classification society Germanischer Lloyd (GL) and certificated at the manufacturer's premises in March 2005. The initial examination of the cranes onboard the vessel was undertaken by GL in July 2005, annual through examinations were undertaken by GL in 2006 and 2007, with the last examination being undertaken 20.08.2008. Records indicated that the hoist wire for the cargo crane was tested and certified in March 2005 by a manufacturer approved by GL.

.2 The four wire rope slings used to connect the cargo crane to the tween deck hatch cover were certified by the manufacturer in April 2006 with a SWL of 15 tonne.

.3 The hatch cover gantry crane was manufactured in accordance with drawings examined by GL and was initially examined by GL in 2005, annual through examinations were thereafter not undertaken as required by merchant shipping regulations until the initial examination was repeated again on 15.10.2008. Records for the gantry crane indicated that the hoist wire was manufactured in February 2006 and installed onboard in June 2006.

2.5 Hatch Cover Configuration

.1 The pontoon tween deck hatch covers were certified by GL for workmanship and compliance with approved drawings at the manufacturer's premises in May 2005 before supply to the vessels new build shipyard. The tween deck configuration for hold number 1 consisted of four pontoon hatch covers which covered the full breadth of the hold and rested and locked into supports welded into the longitudinal cargo hold bulkheads.

.2 The tween deck hatch covers were intended to be moved and arranged using the hatch cover gantry crane, the manufacturer of the hatch covers specified that four wire ropes, two port and two starboard should be used for this operation and attached to the hatch cover with shackles to the stay fore and aft holes.

Figure 1. View of port forward cargo crane used during the accident (view taken from the cargo hold tank top looking aft), three of the tween deck hatch covers and two of the supports upon which the hatch covers rest on the side of the hold are also visible.

SECTION 3 – ANALYSIS

3.1 Aim

.1 The purpose of the analysis is to determine the contributory causes and circumstances of the accident as a basis for making recommendations to prevent similar accidents occurring in the future.

3.2 Lifting Operations

.1 At the time of closure of the tween deck hatch covers the hatch cover gantry crane was being examined by the Second Engineer with respect to a hydraulic oil leakage. The vessel at this time had two Chief Officers onboard, the C/O who was being relieved in Antwerp was assisting the Second Engineer by operating the hatch cover gantry crane. The Second Officer who would normally drive the gantry crane was off duty and asleep at this time. The movement of the tween deck hatch covers was discussed between the two Chief Officers and a vhf radio was handed over to the relieving C/O in order to communicate with the crane driver.

.2 At the time of operation to close the tween deck hatch covers the stevedores were taking a morning break and were expected back at 10:30, it was stated by the charterers port captain who co-ordinates cargo with the stevedores that the plan was for the tweendeck hatch covers to be closed using the shore crane after the break.

.3 The use of the cargo crane as opposed to the hatch cover gantry crane changed the manner of the lifting operation in so far that the lift using the cargo crane involved four wires transferring the load at an angle from the hatch cover lifting points to the centrally located crane hook.

.4 The lifting rope angle which is dependent upon the rope length is of a critical nature with regard to the force transferred to the wire rope, shackle and hook. The minimum rope length proposed by the manufacturer following the accident for a lift involving the cargo crane would be 13m, whereas the length of wire rope used during the accident was approximately 9m.

.5 The lifting operation if undertaken using the hatch cover gantry crane in accordance with the manufactures instructions would have involved four wires lifting and transferring the load vertically.

.6 The C/O and OS entered into the cargo hold from the main deck using a temporary short ladder onto the tween deck hatch covers to be moved and stood on the topmost hatch cover. The four wire slings were attached from the crane hook to four container castings by the C/O and OS. The OS then climbed out of the cargo hold via the short ladder and proceeded to the aft end of the cargo hold to the intended location where the hatch cover was to be lifted.

.7 Each pontoon hatch cover had as part of its construction eight container castings welded into the top plate, aligned in a longitudinal direction, four castings that were intended to be used for lifting the hatch cover, located at the outer corners. Four additional casting were located approximately one meter inboard of the lifting point castings with these inner castings intended to be used for the fitting of stacking cones to permit the hatch covers to be stacked on top of each other.

Figure 2. View of tween deck hatch cover pontoon landed ashore following the accident showing the two outer and two inner container castings on the starboard side of the hatch cover, the T hooks are shown inserted into the inner castings and aligned as per the lifting operation using the cargo crane. (N.B. the painting of the container castings in different colours was carried out after the accident as an interim recommendation during the investigation onboard).

.7 The OS who had assisted the C/O in connecting the lifting wires was of the opinion following the accident that the lifting wires had been fixed into the inner castings of the hatch cover.

.8 This was confirmed as accurate following the accident by visual examination of the hatch cover castings were it could be observed that deformation had occurred to the plate edges of the inner castings when the T hooks had been torn out of the castings as the hatch cover fell.

Figure 3. View of inner container casting showing deformation of the plate edge caused as the hatch cover released from the T hooks, the circular indent to the plate edge is from the locking pin (smaller diameter pin shown) of the T hook.

3.3 T Hook attachment to the hatch cover

.1 The lifting wires from the crane were connected via shackles to the T hooks which fitted into the container casting and were turned 90 degrees so the lower portion of the T hook was then transverse to the hatch cover. A locking pin was supplied with the intention being for this pin to act as an anti-rotation device for the T hook during the lift by contacting with the inner transverse structure of the hatch cover in way of the container casting.

Figure 4. View of T hook shown next to a container casting in the position it would be in relative to the casting during a lift if correctly turned 90 degrees.

Figure 5. T hook fitted as intended in an outer container casting (lifting point) showing the hole for the locking pin, visible also is the inner transverse structure of the hatch cover upon which the pin contacts in order to stop the T hook from rotating during the lift.

.2 During the investigation the T hooks were inserted into the four inner container castings intended for the use of the stacking cones as would have been the case during the accident. It was observed that in this location the T hooks could only be turned approximately 45 degrees due to the inner structure of the hatch cover at this location.

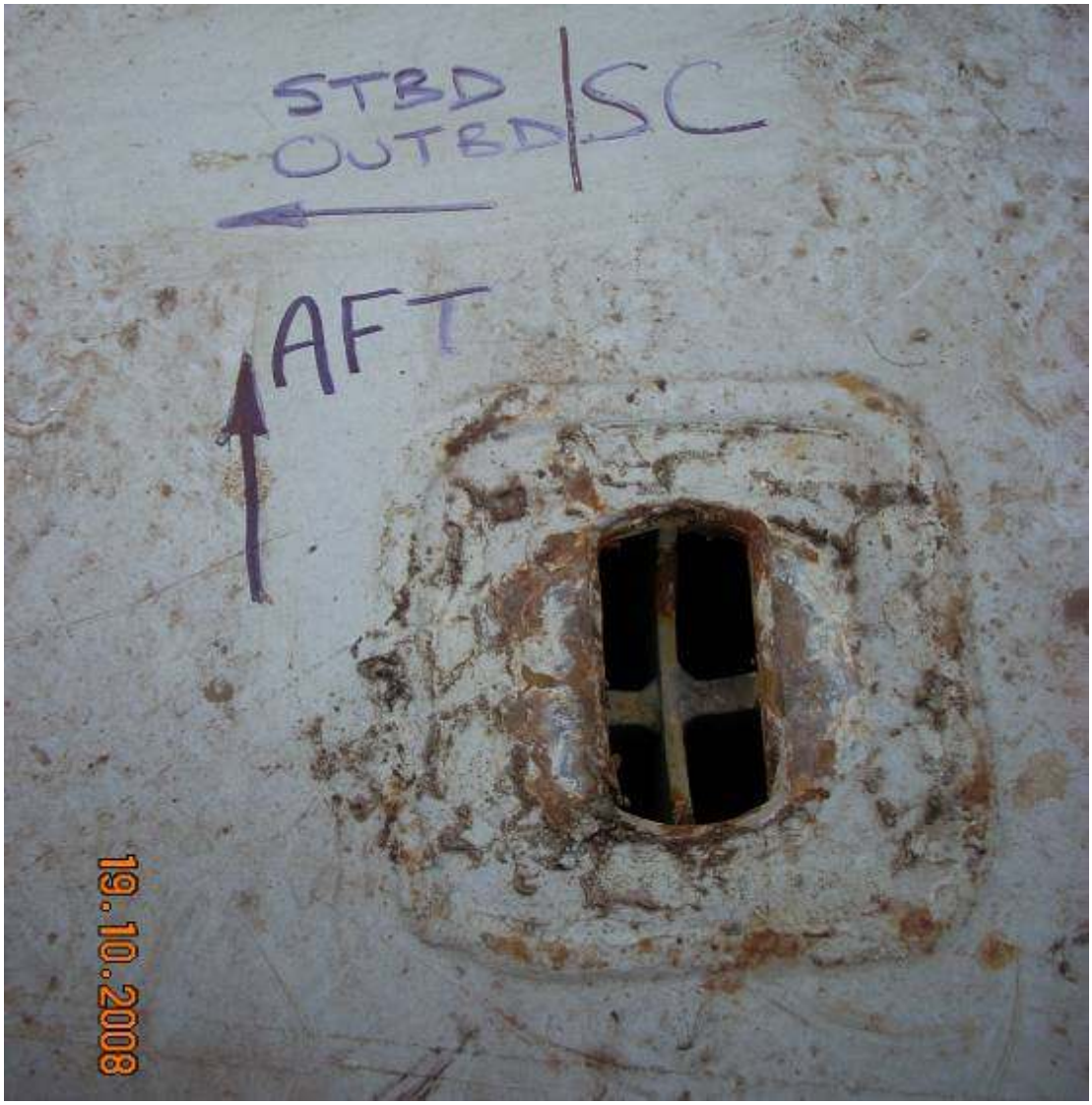
.3 Additionally due to the use of the cargo crane instead of the hatch cover gantry crane the T hooks would tend once under load to align toward the direction from which the load was being lifted, which in this case was at an angle toward the central crane hook.

Figure 6. View of T hook inserted into inner container casting and aligned toward the central lifting hook, the T hook is unable to be turned the required 90 degrees due to contact with the hatch structure below.

.4 Figures 7 and 8 indicate the typical difference between the internal hatch structure in way of the container castings, this difference being the reason as to why the T hooks could not be turned 90 degrees when inserted into the inner container castings.

Figure 7. View indicating an outer container casting intended for use as a lifting point.

Figure 8. View indicating an inner container casting intended to be used with stacking cones.



.5 As shown in figure 9 it was also noted that when the T hooks were fitted into the inner container castings the contact between the T hook and the hatch cover was poor with movement and clearances of such a nature that the locking pin could not perform any function in securing the T hook in position. The locking pin was considered not to be able to perform its intended function unless the T hooks were turned 90 degrees in the container socket.

Figure 9. View of T hook fitted into inner container casting as would have been the case during the accident indicating unsatisfactory clearances and locking.

Figure 10. View of T hook fitted into outer container casting.

.6 Figure 10 shows the T hook correctly fitted into the outer container casting and aligned for a lift using the hatch cover gantry crane.

3.3 Arrangement of tween deck hatch covers in forward cargo hold

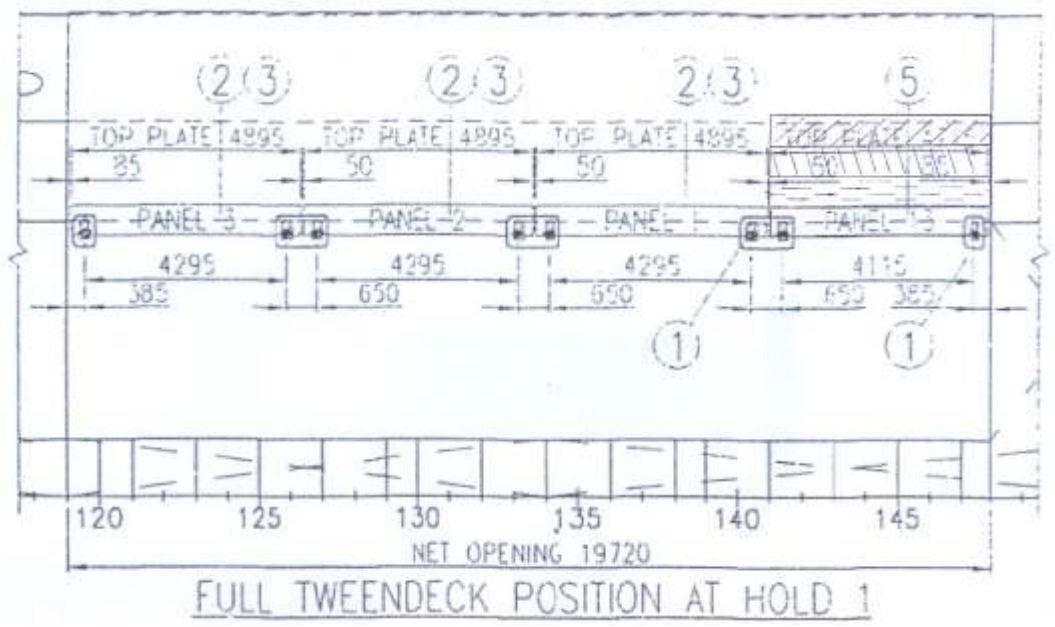
.1 At the time of the accident the four tween deck hatch covers in No. 1 cargo hold were stacked one on top of another at the forward end of the hold resting on the tween deck supports at that location. This temporary stacking arrangement was carried out in order to facilitate the loading of cargo onto the tank top at the aft end of the cargo hold.

.2 The ideal stowage position for the hatch covers as recommended by the hatch cover manufacturer was stacking onto the tank top, alternatively with the authorisation from the port the hatch covers could also be stacked ashore during cargo operations if not possible within the cargo hold. The use of either of these alternatives could have removed the risk of fall that was inherent in stacking the tween deck hatch covers at the tween deck height.

.3 At the forward end of the cargo hold a protected ladder access was provided to both the tank top and tween deck. However due to the temporary stacking of the four tween deck hatch covers in the forward location on top of each other the protected access to the tween deck level was obstructed.

.4 The obstruction of the protected ladder access therefore facilitated the need for the C/O and OS to climb down to the tween deck hatch covers from the main deck using a portable ladder.

Figure 11. View of No. 1 cargo hold showing the four tween deck hatch covers stacked at the forward end of the hold in the position prior to the accident.



.5 The decision to remain on the hatch cover during the initial lifting operation would have been influenced by the need to hold the lifting shoes in place until the load was taken by the crane and then further influenced by the fact that the protected ladder access was obstructed by the hatch covers. It may be speculated that the intention was to move the hatch cover a sufficient distance aft to then permit the C/O to step down onto the hatch cover below.

Figure 12. View of aft bulkhead of No.1 cargo hold showing the protected access to the tank top and tween deck levels, the lower tween deck hatch cover would have rested in the position shown with the lighter paint coating with the three remaining hatch covers stacked on top thereby restricting the access to the tween deck level.

SECTION 4 – DISCUSSION

4.1 Safety Management aspects

.1 On the 4th April 2008 a fatal accident occurred onboard another vessel managed by the same company as the BBC Atlantic involving the lifting of tween deck hatch covers, following an preliminary investigation an Improvement Notice was served by the Gibraltar Maritime Administration on the DPA / Quality and Safety Manager for the management company.

.2 The Improvement Notice related to all managed vessels including the BBC Atlantic and identified among other requirements and in accordance with the applicable Merchant Shipping Regulations that every lifting operation is required to be properly planned, appropriately supervised and carried out in a safe manner.

.3 The Improvement Notice also identified the requirement that lifting equipment should not be used for lifting persons unless it was specifically designed for that purpose.

.4 During May 2008 the managing company issued a circular letter to all vessels in response to one of the requirements of the Improvement Notice. This circular letter also highlighted in the narrative of the letter the requirement that lifting appliances were not to be used for the transportation of persons.

.5 Following the earlier fatality the Gibraltar Maritime Administration also issued a Shipping Information Notice in June 2008 to all operators of Gibraltar registered ships highlighting the requirements for lifting operations and lifting equipment maintenance, inspection, test and certification. This Information Notice highlighted the requirement that every lifting operation is required to be properly planned, appropriately supervised and carried out in a safe manner.

.6 The company safety management system included the requirement to undertake training in the operation of the onboard cranes which included a review of relevant literature and a practical training session which included the shifting of tween deck pontoons.

.7 The A.B. and O.S. involved in the lifting operation at the time of the accident were holding crane training certification issued by the company following documented training undertaken in August and July 2008 respectively.

.8 The C/O arrived on the vessel following a period of leave at 23:30 on the 18th October and commenced duties at 08:00 am the following morning. A record of crew familiarisation with duty was completed for the C/O on the 19th October to indicate that familiarisation had been undertaken as per the requirements of the companies safety management system.

.9 The person overseeing and confirming the familiarisation was indicated as being the 2nd Officer who was also designated as the onboard Safety Officer, during the investigation it was indicated that the 2nd Officer was off duty and asleep at the time of the accident at 09:50.

.10 It is considered therefore that the record of familiarisation for the C/O following the return to duty was not an accurate reflection of an adequate familiarisation with duty being undertaken. The C/O had served onboard the vessel previously as Chief Officer during 2007 and 2008 and this may have had a bearing upon the approach to familiarisation being adopted.

.11 In not undertaking an adequate familiarisation it is possible that an opportunity could have been missed to ascertain the alertness of the C/O and to gauge as to whether the travelling on the previous day had resulting in any level of fatigue that could have affected decision making and risk perception.

4.2 Risk Assessment and onboard safety culture

.1 It is considered from the events of the accident that the safety culture onboard the vessel was deficient in respect to the evaluation and perception of risk.

.2 Particular risks that were not identified either before or during the lifting operation included the following,

- The use of the cargo crane instead of the dedicated hatch cover gantry crane changed the lifting arrangement without an assessment on the implications with regard to load transfer and attachment of the crane to the hatch cover.

- The stacking of the tween deck hatch covers at the forward end of the cargo hold at the tween deck level contrary to the manufacturers recommendation required the crew to walk onto the hatch cover without a realisation of the existence of a dangerous edge with a potential fall to the hold bottom.

- The risks associated with a lack of effective locking of the lifting attachments to the hatch cover, were not realised or examined.

- The risks inherent in the crew remaining on the hatch cover during the lifting operation were not identified.

.3 It was apparent that lifting operations onboard the BBC Atlantic were not being appropriately planned and carried out in a safe manner. Furthermore the response of the company in ensuring that all lifting operations were appropriately planned and carried out in a safe manner following the issue of the Improvement Notice following the earlier fatality involving the movement of tween deck hatch covers on another vessel was judged inadequate in ensuring the safety of lifting operations onboard the BBC Atlantic.

.4 The lack of effective safety culture onboard the vessel was evidenced by the lack of perception of risk associated with the crew climbing onto the tween deck hatch covers to attach the lifting attachments without suitable safety lines being provided to arrest a fall. In effect the company's procedures for working at height were deficient in so far that a risk of fall was not identified and measures such as a risk assessment or a permit to work system were not undertaken.

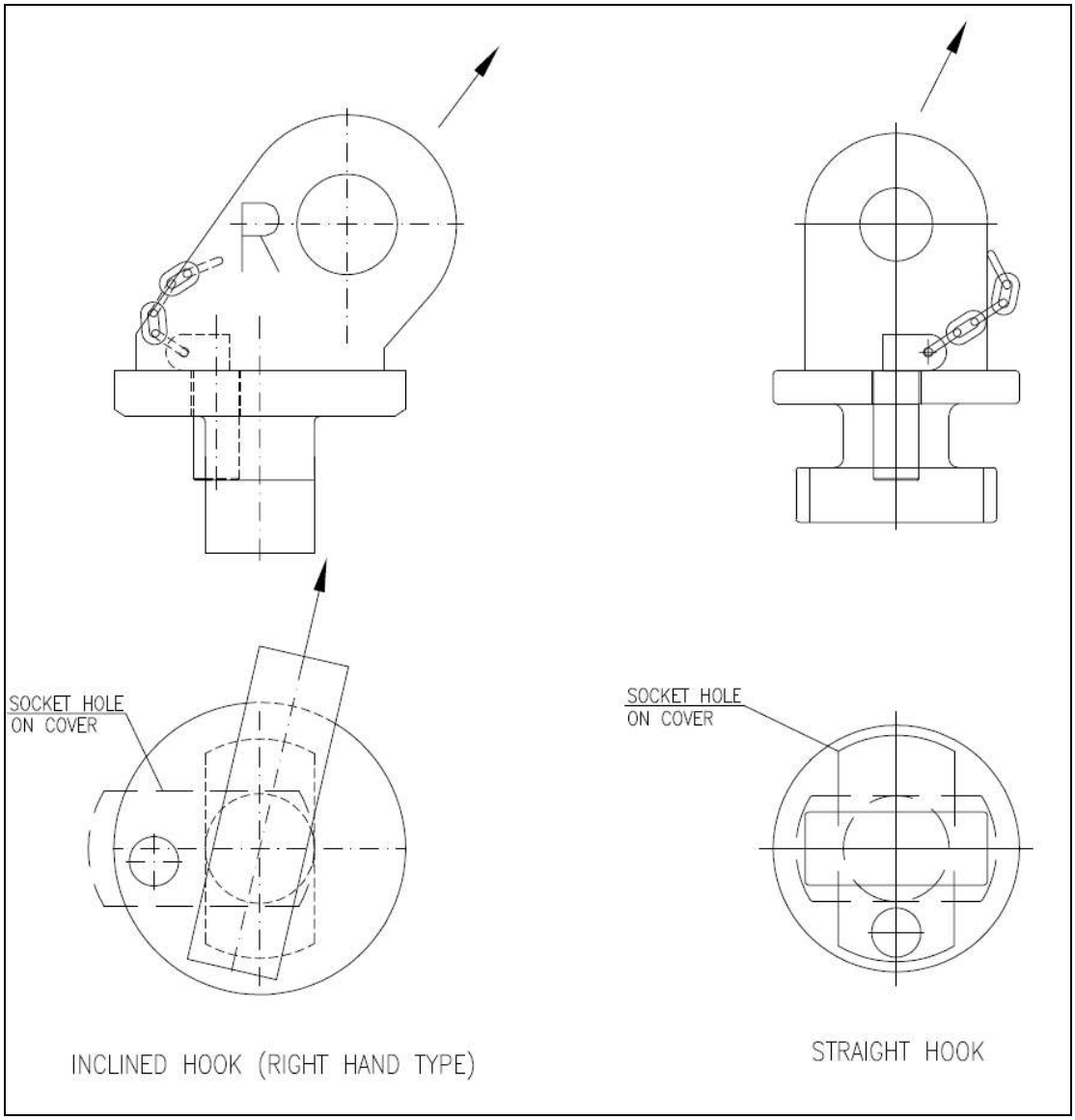
.5 Further evidence of a deficient safety culture onboard could be observed by the inability of the crew to identify, highlight or temporarily halt an unsafe lifting operation involving a higher ranked officer.

SECTION 5 – Action Taken

.1 Briese Schiffahrts GmbH & Co. KG issued a Circular Letter to all Captains and crew onboard their managed vessels on 29.12.08 concerning the opening / closing of hatch covers, use of the gantry crane and shifting of tweendeck panels, and signage. The circular letter amongst other aspects highlighted the need for lifting equipment to be used for its intended purpose, the requirement not to stand on or under a hatch cover during lifting operations, reference to the use of manufacturers instruction manuals, and the requirement to place safety signage highlighting the risks of standing on or under a moving load at the control station of both the cargo cranes and the hatch cover gantry crane.

.2 Mariner Ships Equipment designed a lifting arrangement following an inquiry from a shipowner for the lifting of tweendeck panels using a ships cargo crane. The arrangement required the use of an inclined design hook as opposed to the straight hook type used during the accident and intended for use with a vertical lift using the tween deck gantry crane **(figure 13)**. It was however also recognised that a potential for confusion on the part of ships staff may exist with both inclined and straight hooks on the same vessel and that a spreader frame with connections at four corners to vertical wire ropes to the straight hooks could also be recommended.

Figure 13. Sketch of inclined and straight T hooks (Mariners Ships Equipment)



SECTION 6 – CONCLUSION

6.1 Safety Issues directly contributing to the accident which have resulted in recommendations.

1. The use of the cargo crane to move the tween deck hatch covers instead of the dedicated hatch cover gantry crane resulted in a turning moment being applied to the T hooks as they became aligned in the direction of the central crane hook, this therefore reduced the effectiveness of the contact and locking between the lifting shoes and the hatch cover.

2. The use of the inner container castings to affix the T hooks instead of the outer castings resulted in the T hooks being ineffectively fitted and locked into the container casting due to the internal structure of the hatch cover.

3. The necessity for the C/O to remain on the tween deck hatch cover during the commencement of the lifting operation would have been influenced by the unsatisfactory fitting and locking of the T hooks into the inner container castings.

4. The inadequate planning of lifting operations onboard the vessel contributed to the decision to use the cargo crane for the lifting operation without understanding the necessity to maintain the hoist wire in a vertical orientation during the lifting operation or to understand the locking arrangement for the lifting attachments.

5. The judgement of the C/O in recognising the safety risks inherent in remaining on the hatch cover during the commencement of the lifting operation may have been affected by having just returned onboard the previous evening at 23:30 from a period of leave and having then commenced working duties at 08:00 on the morning of the accident.

6. The stacking of the tween deck hatch covers on top of each other at the tween deck level resulted in a potential dangerous edge that was not identified. Due to the lack of risk identification, measures were not undertaken to mitigate the risks of working at height.

7. The effectiveness on the onboard crane training should be questioned in light of the accident.

8. The familiarisation of the C/O following a return to duty was not undertaken in a satisfactory manner and an opportunity was therefore missed to ascertain the alertness of the C/O and to gauge as to whether the travelling on the previous day had resulting in any level of fatigue that could have affected decision making and risk perception.

6.2 Other safety Issues identified during the investigation also leading to recommendations.

1. The lack of risk assessment techniques and other safety management tools used as part of the companies safety management system including the use of an onboard safety committee meetings and other mechanisms to involve the crew in safety discussion and improvement would have a direct influence upon the safety culture onboard the vessel and hence the judgement and understanding of the crew in assessing safety risks.

2. The T hook locking arrangement when examined in the outer castings as intended for lifting the tween deck hatch covers was noted to be unsatisfactory with excessive clearance and movement inherent in the design.

6.3 Safety issues identified during the investigation which have not resulted in recommendations but have been addressed.

1. Following discussion and recommendation during the accident investigation onboard the vessel the company undertook measures to reduce the risk of visual miss-identification of the container castings to be used for lifting the tween deck hatch covers. The outer container castings were painted yellow and marked ‘Lifting Point’ and the inner container castings were painted red and marked ‘Stacking Cone Only’. The lifting hook of the hatch cover gantry crane was also painted yellow to match the colour of the lifting points.

SECTION 7 – RECOMMENDATIONS

Briese Schiffahrts GmbH & Co. KG is recommended to**:**

1. Ensure that all lifting operations are appropriately planned **in detail** and documented within the onboard safety management procedures. Such detailed planning should amongst other aspects include the lifting appliance to be used for each type of load, the loose gear and lifting attachments to be used for each type of load, the method of attachment and locking of the lifting attachments, the number, designation and training of crew to oversee the lifting operation, the safe location where each crew is required to stand during any lifting operation.

2. Ensure that cargo cranes are prohibited for use in moving hatch covers unless the hoist wire is maintained vertical by the use of a suitably designed, tested and certified spreader frame or alternatively the lifting arrangements are in accordance with the hatch cover manufacturer's requirements with regard to the length of the hoist wires and the use of inclined hooks.

3. The action taken by the company as per 6.3.1 to reduce the risk of visual miss-identification of the container castings where the outer casting was painted yellow and marked 'Lifting Point' and the inner casting used for the stacking of the hatch covers was painted red and marked 'Stacking Cone Only' should be extended to all applicable managed vessels.

4. The T hooks used onboard should be also be included in the colour coding system and painted yellow to match the outer container casting (lifting point).

5. Examine the procedures relating to crew familiarisation, hand over and commencement of duties takes into account the potential for seafarer fatigue due to travelling following a return to duty.

6. Implement the use of risk assessment techniques with regard to lifting operations to identify hazards and to determine and assess risks. This assessment may be undertaken in conjunction with the detailed planning of lifting operations.

7. Implement the use of onboard safety committee meetings and other measures to increase the involvement of the crew in safety matters and provide a forum for the onboard discussion and promotion of safety matters.

8. Ensure that tween deck hatch covers are stacked in accordance with manufacturers' recommendations with a view to eliminating potential falls from height during lifting operations.

9. Review the effectiveness of onboard crane training procedures.

Mariner Ships Equipment is recommended to:

1. Review and improve the design of the arrangement for attachment and locking of the lifting appliance to the tween deck hatch covers. The design of the arrangement should ensure that the lifting attachments can only be fitted into the intended lifting point.