

Marine Accident Report



DUCHESS of
SCANDINAVIA
Occupational accident
on 11 August 2005

The Division for
Investigation of
Maritime Accidents

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When completed the casualty report will be available on our homepage: www.dma.dk.

The Division for Investigation of Maritime Accidents

The Division for Investigation of Maritime Accidents is responsible for investigating accidents and serious occupational accidents on Danish merchant- and fishing ships. The Division also investigates accidents at sea on foreign ships in Danish waters.

Purpose

The purpose of the investigations is to clarify the actual sequence of events leading to the accident. With this information in hand, others can take measures to prevent similar accidents in the future.

The aim of the investigations is not to establish legal or economic liability.

The Division's work is separated from other functions and activities of the Danish Maritime Authority.

Reporting obligation

When a Danish merchant- or fishing ship has been involved in a serious accident at sea, the Division for Investigation of Maritime Accidents must be informed immediately.

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1 Summary

DUCHESS OF SCANDINAVIA was going to depart from Cuxhaven and the crew was occupied with their routines in connection with the departure procedures. The master and the chief officer were on the bridge, the officer on duty and two AB's were on the aft deck and the boatswain and one AB were at the forecandle.

The weather was good; sunny and with almost no wind.

Shortly before departure time at 1700 hours, an order was given from the bridge to single up fore and aft. The chief officer and the master heard on the radio an unusual communication from the forecandle and they got the feeling that something had happened. This was confirmed by a call from the boatswain shortly after.

It turned out that the forward mooring winch in the port side had caught the AB by the sleeve of his boiler suit, and he had been pulled around with the winch two or three times after which he had fallen down on the deck.

The boatswain who was handling the winch from starboard side by a remote winch control stopped the winch immediately when he found out what was happening.

The boatswain could neither see the AB nor the port winch from where he was standing in starboard side.

The AB was brought to hospital by an ambulance shortly after.

2 The Investigation

The Division for investigation of Maritime Accidents received information on the accident the following day from the ship's owner; and a few days later, the Division received a report from the master.

Furthermore, the Division received a statement in writing describing how the injured AB and the boatswain who had been closest to the scene of the accident experienced the sequence of events which lead to the accident. The statement was in Polish and it was subsequently translated into Danish.

The Division for Investigation of Maritime Accidents has moreover examined the conditions on board the ship and spoken with the crewmembers who were involved in the accident. This was done in connection with a roundtrip, Cuxhaven – Harwich, in the period between 14 and 16 September 2005.

3 Factual Information

3.1 Accident data

Type of accident (the incident in details)	Occupational accident – injury during mooring operation
Character of the accident	Personnel injury
Time and date of the accident	On 11 August 2005 at approximately 1700 hours
Area of the accident	Port of Cuxhaven, Germany
Injured persons	An able bodied seaman

3.2 Navigation Data

Stage of navigation	Alongside
Port of departure	Cuxhaven
Depth of the time of the accident	5.40 x 5.80 M
Pilot on board	No

3.3 Ship data

Name	DUCHESS OF SCANDINAVIA
Home port	Copenhagen
Call sign	OUZI2
IMO No	9058995
Registration No	A 511
Register	DIS
Flag State	Denmark
Construction year	1993
Type of ship	RO-RO passenger ship
Tonnage	16794 GT
Classification	DNV
Length/breadth/depth	122.80/24.00/13.20
Engine power	115520 kW
Area served	Short international voyage
Permit	Cuxhaven, Germany to Harwich, England
Regulation	Meddelelser fra Søfartsstyrelsen B (SOLAS)

3.4 Weather data

Wind – direction and speed	NW 4-5
Visibility	Good visibility
Light/dark	Within normal daylight hours

3.5 The Crew

Number of crewmembers	75
Number of crewmembers certified to act as bridge watch	4
Watch on the bridge	3 shift
Occupation on board the ship at the time of the accident	Age, Certificate of Competency, other certificates, training, sailing time.
Master	47 years, master. He has been employed by DFDS Seaways since 1975. Acting master since 1996 and appointed master on 1 February 2000. He has been the master of DUCHESS OF SCANDINAVIA since the ship was chartered for the route between Cuxhaven and Harwich on 11 April 2003. Normal working periods on board the ship are on a 14 days on / off basis.
Acting chief officer	31 years old, mate of 1 degree. Finished at Svendborg Maritime Academy in 1999. Holds a Certificate of competency as Mate, 1 st class. Since 1999 he has been sailing as mate in DFDS A/S. He had a year's leave from DFDS in 2003 and during this period, he sailed as mate in Lauritsen. He has been acting chief officer on DUCHESS of SCANDINAVIA since April 2005. Normal working periods on board the ship are on a 14 days on / off basis.
Boatswain	31 years old. He sailed for the Polish Marine where he was employed for approximately 4 years. And then employed in the merchant fleet as OS/AB since 1998. He has been employed by DFDS since 1999, and he has been on DUCHESS OF SCANDINAVIA since the ship was chartered for the route between Cuxhaven and Harwich in 2003. He is safety representative on board. He signs on for a period of 2-3 months.
The injured AB	42 years old. This was the second time he signed on DUCHESS OF SCANDINAVIA. He has been on board the ship for approximately 3 months.

3.6 Narratives

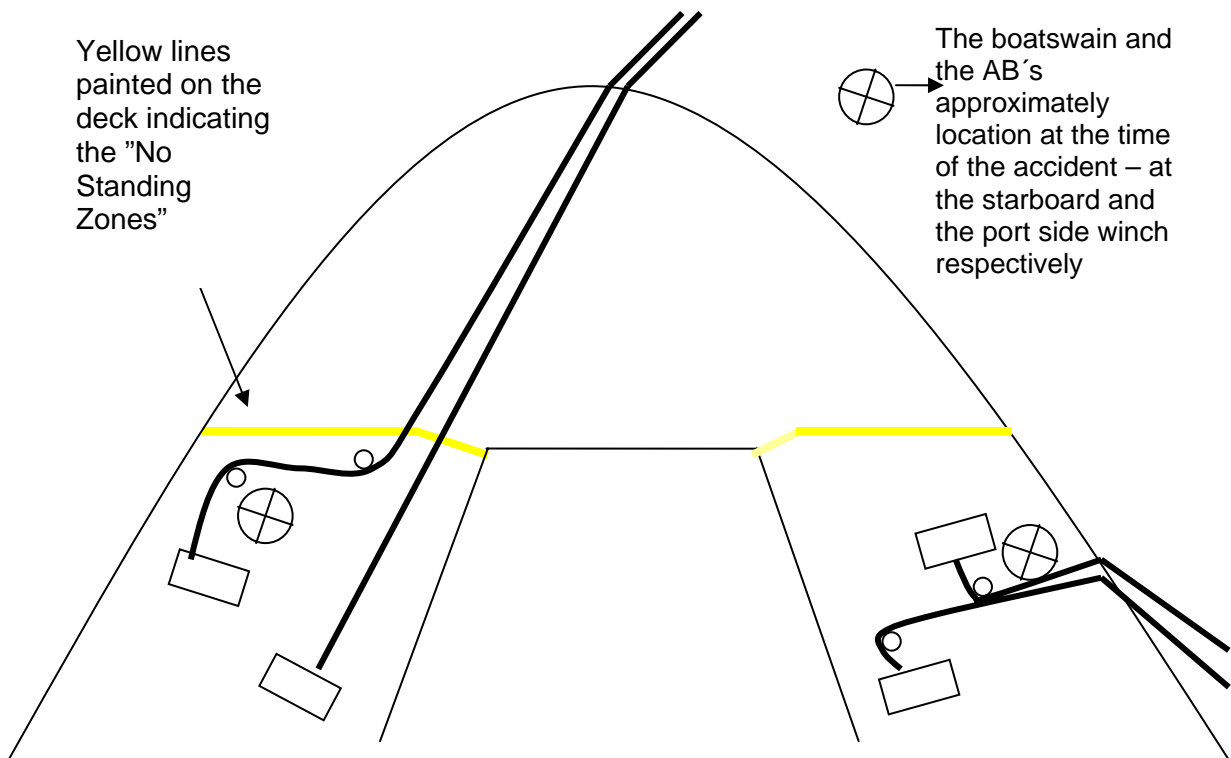
The following description of the sequence of events leading to the accident is based on written statements from the boatswain and the injured AB. Furthermore; the boatswain has given an oral statement to the Division for Investigation of Maritime Accidents on board DUCHESS OF SCANDINAVIA on 15 September 2005

Shortly before departure from CUXHAVEN at 1700 hours on 11 August 2005, the boatswain and the AB went to the forecastle to prepare for departure.

Both the AB and the boatswain carried radio.

The chief officer gave the order by radio to single up.

The ship was in both ends moored with two spring lines and two hawsers (see sketch below).



Sketch of the mooring arrangement on the forecastle – see also the picture under section 3.7 According to the boatswain, the yellow lines indicates the area on the deck where the crew must be placed (forward of the lines) when the winches are operated and when there is no visual contact with the winch operator.

The boatswain operated the winches by a remote controlled winch he was carrying in a brace-end around his neck.

The boatswain eased off the hawser and when the hawser was cast off from shore, he started to pull in by the winch. After having done this, he went to starboard side winch (shore-side) to slack on one of the two spring lines.

After the boatswain had begun to pull in the hawser, the AB went to the port side.

The boatswain and the AB could not see each other from their individual position. Furthermore, the boatswain could not see the port winch from his position in the starboard side.

While the boatswain pulled in the hawser by the switch on the remote control, he eased off the spring line simultaneously, this also by the use of the remote control.

The boatswain had to ease off the spring line by hand because there was not so much tension as needed to make the hawser ease off by itself.

While the hawser was winded up on the port winch, the AB handled the hawser by hand in the attempt to shift its position on the drum.

The sleeve from the AB's boiler suit was caught or got stuck between the drum and the hawser, and he was pulled along with the winch drum and continued around with the drum two or three times after which he fell on deck. He shouted to the boatswain to stop the winch.

The boatswain heard the AB shouting over the radio, and he immediately stopped both winches. Subsequently, it turned out that the end of the hawser was almost on deck.

He immediately went to the port side and he found his colleague lying on deck in front of the forward winch.

The AB seemed chocked but said that he was OK. After a little while, he remembered what had happened and that he had been pulled around the winch.

The boatswain called the bridge and explained what had happened. The master asked if medical assistance was required which the boatswain confirmed.

The duty officer came to the forecandle almost immediately, and a short while after, the chief officer also came to the forecandle.

The injured AB was carried to the ramp on a stretcher. An ambulance arrived within 5 minutes.

The following description of the sequence of events is based on a written statement from the master and an oral statement from both the master and the chief officer.

On the day of the accident, the master signed on and he was on board the ship in Cuxhaven at approximately 1300 hours.

The handing over of the watch went as usual and was concluded at approximately 1500 hours. After this the master had a rest and he prepared for departure.

On 9 August 2005, two days prior to the accident, the chief officer signed on in Cuxhaven.

On the day of the accident, the chief officer came to the bridge at 1620 hours. He went through the bridge procedures according to the pre-departure checklist and he was continuously in contact with the terminal and with the officer on duty to ascertain whether the ship would be able to depart on time.

At approximately 1640 hours the master came to the bridge. The chief officer and the master went through the departure routines together because the chief officer had only been acting chief officer for a relatively short period of time.

At 1650 hours the terminal reported that all passengers and the cargo were on board the ship.

The master gave all orders in connection with the departure which the chief officer passed on by radio.

When the "manager" who is in charge of the registration of the passengers from the terminal came on board the ship, the master gave notice to the engine room and the terminal was told to remove the gangway.

At approximately 1655 hours, the gangway was clear of the ship. The chief officer told the duty officer who was on the aft deck to close the stern ramp. The master called the engine room and asked for the manoeuvring of the engines to be shifted to the bridge. The chief officer informed the port control that the ship would depart on time at 1700 hours.

The master shifted the manoeuvring of the engines to the bridge.

The ship was in both ends moored in two spring lines and two hawsers.

After this, the master told the crew to single up fore and aft (to a single spring line and a hawser in each end).

The master heard that the duty officer aft reported back that they were not yet ready to single up.

All deck crewmembers carry radio. The communication between the bridge and the deck is normally in English.

The master and the chief officer were on the bridge, the boatswain and one AB on the forecastle and the duty officer and two ABs on the aft deck. This is the normal manning at departure from Cuxhaven under normal circumstances.

The weather was good – sunny and no wind.

Everything went according to routine and without any stress of any kind.

The master was waiting for the crew to report that they had singled up from both the forecastle and the aft deck when he heard a lot of communication in Polish over the radio.

The chief officer who understands Polish said to the master "something is wrong". The chief officer told the master that it sounded as if something was seriously wrong.

According to the chief officer, somebody shouted, "stop". Shortly after the boatswain called the bridge and reported in English that his colleague had been injured.

The master stopped all further departure proceedings

The master and the chief officer could not see the persons on the forecastle from the bridge.

The boatswain asked the chief officer for help. The chief officer called the duty officer and told him to go to the forecastle. The chief officer also went to the forecastle.

The master called the information desk on board and asked them to bring the first aid equipment to the forecastle.

The chief officer and the officer on duty came to the forecastle at the same time.

They found the injured AB lying in front of the winch. He was lying on the deck and he had blood on his face and he was complaining over pains in his shoulder.

The injured AB was of the opinion that it was not necessary for him to be brought to hospital. However, the chief officer and the officer on duty agreed that it was necessary to get help.

The chief officer estimated that the AB had to be brought to hospital and he told this to the master.

The master contacted the terminal and asked them to call for an ambulance. An AB standing aft was told to open the stern ramp and to be ready to receive the ambulance.

They made a stretcher ready and the injured AB was brought to deck 1. The stern ramp had been made ready in the meantime. When the ambulance arrived, the ramp had just been made ready.

A doctor arrived and the situation was explained to him.

The ship departed Cuxhaven with approximately 15 minutes' delay.

3.7 The deck's arrangement and equipment



Photo: The ship alongside the port of Cuxhaven on 16 September 2005 – moored as on the day of the accident with two relatively short hawsers and two small spring lines.

The mooring winches are placed aft of the forepart of the accommodation. There are two winches on each side and one centre winch placed at the forepart. The centre winch was not used on the day of the accident.

The winch operator can see all of the hawsers ashore through the marked openings (see mark on the picture above). However, it is not possible to see the winches in the opposite side from this position.

The hawsers ashore can be seen from the forward part of the deck. From this position the forward winch in port side can also be seen. It is, however, difficult to see the spring lines due to the construction of the accommodation.



Photo: Photo taken on 14 September 2005. Forward winch port side.

The picture above was taken while the ship was alongside in the port of Cuxhaven. The guide pulley in the front of the picture has the effect that the hawser has a tendency of spooling upon the outer side of the winch drum.

According to the master, a part of the hawser normally has to be spooled off again after departure in order to straighten it out.

When mooring in Harwich where the ship has port side alongside, the guide pulley is used on the opposite side (the inner side). The direction of the hawser from the pulley is in this case approximately in the centre of the winch drum.

Safety zones – “No Standing Zones”



Photo taken on 14 September 2005

The limit for the “No standing Zones” (yellow lines) were initially painted in February 2004 on the recommendation of the deck’s safety group – see details in 3.12 last paragraph.

The yellow lines were repainted after the accident. The deck on the forecastle was painted all over during the summer 2005 which partly had erased the stripes. By mistake, the lines had not been clearly repainted.

According to the information from the chief officer and the boatswain, the stripes were partly visible and therefore not completely erased.

Winch control



Photo: photo from 14 September 2005. Portable winch control (wireless)

The winch control on the photo is carried in a brace-end around the neck so that the operator has both hands free.

The winch control can be used all over the forecastle up to a distance of approximately 200 meters from the winches, according to the information gained by the Investigation Division.

The four upper switches operate the winches. When the hawser is placed normally on the winch drum, as in this case, the hawser is eased off when pushing the switch forward. The switches automatically go to neutral position and the winch stops when not activated.

After approximately 5 minutes with no use of the winch control, the connection between the winch and the winch control are shut down automatically. By pushing the button below and to the left of the red emergency stop, the contact is re-established. By pushing the button close to emergency stop, the winch's rate of rotation will be reduced by 50%

The switch to the outer right is only used during service of the unit.



Photo taken on 14 September 2005

3.8 Mooring routines and working hours

Normally, the ship departs on a regular time. According to the schedule at 1700 hours Danish time from both Cuxhaven and Harwich. The duration of the passage is approximately 18 hours.

The boatswain, who is dayman, is always on the forecastle at arrival and at departure. It is also always the boatswain who operates the winch control.

At the day of the accident the boatswain's duty began at 0630 hours. His working hour normally ends at 1830 hours, which it also did at the day of the accident.

The injured AB had the 4-8 watch. He had been on watch from 0400 – 0800 hours and then again from 1230 hours and he should have been on duty until 2000 hours.

Normally, there is no officer on the forecastle at arrival/departure.

According to the ship's ISM, the chief officer is in charge of the mooring on the forecastle.

The officer on duty is in charge of the mooring operation on the aft.

The two junior officers work by turn approximately halfway in the period on board, thus they have the same number of 8-12 and 12-16 watches. The officer who is off duty at arrival / departure does normally not have to participate in the mooring.

The chief officer had been on duty from 0500 to 0800. He had his breakfast and slept for approximately one hour prior to arrival Cuxhaven. He worked at the office during the day until the time of departure at 1700 hours and he was on duty until 2000 hours. The watch on the bridge was shared between the master and the chief officer during supertime.

3.9 Risk Assessment of the mooring

The work language on board is English, why the work place instructions are in English and are called "Risk Assessment".

Amongst other, the following is written in the instructions for mooring:

"When operating with mooring lines make sure it is possible to see all people on deck, special forward when operating with remote control"

3.10 Instruction of the deck crew

A newly employed AB is familiarised with the ship when coming on board starting with a guided safety tour around the ship. One of the junior officers is responsible for this tour. The AB then works together with the boatswain for at least a week where the boatswain gives general instruction in the daily routines. Furthermore, the boatswain hand out and assists the new crewmember filling in an ISM checklist "Instruction of the Deck Crew", which is then given to the chief officer.

According to the information that the Investigation Division has received, the AB had been instructed when he signed on for first time.

From the Owner the Investigation Division has received evaluation forms of the AB and the boatswain. The master draws up the form on board for each member of the decks crew when they sign of and forward the form to the company. Among other things, it appears that both the boatswain's and the AB's English proficiencies were "wholly satisfactory".

It was fully possible for the boatswain to describe the sequence of events and to give other relevant statements in adequate English when the Division for Investigation of Maritime Accidents took statements on board the ship.

The boatswain was a member of the safety group on board.

3.11 Survey on board

DUCHESS OF SCANDINAVIA was chartered by DFDS A/S for the route Cuxhaven / Harwich in the fall of 2003. The Danish Maritime Authority made the first survey on board on 16th October 2003 including a survey of the working environment.

Among other things, the following remarks and demands appear from the survey report:

"It was found that the sight conditions at the positions from where the winches were operated on the forecastle were insufficient. A system for remote control of the winches had been purchased so that it was possible to have an overview of each individual

winch from the position where it was possible to use the system for remote control of the winches”

“It must be ensured that the crewmembers are made aware that remote operation of the winches must be carried out so that the sight conditions from the positions from where the winches are operated to the mooring deck are satisfactory”

By the ship’s reporting back on the demands, the following appears:

” The importance of this matter, has been informed to the deck crew at several occasions, and has also been brought up during the deck department meetings at the 24th of November 03 and the 21st of January 04 (filed in the minutes of meeting). The risk Assessment regarding mooring has also been adjusted for this item, at the 16th of November. It has recently in the Deck Safety Group, been suggested, to paint some yellow “no standing” zones, from where the winch operator cannot see another person. This is expected to be implemented in the near future”

3.12 Evaluation of the accident on board the ship

After the accident, the chief officer made an evaluation of the accident with the deck crew especially about standing close to the winch, operating several hawsers at a time and about not having a clear view (that the two AB’s on the forecastle are not able to see each other). It was agreed to operate only one hawser at a time when “singling up”.

A safety meeting was held on board the following day in the afternoon. Initiatives earlier taken by the safety group were discussed. The initiatives had been taken to prevent accidents from happening during mooring operation and they were a result of the requirements from the Danish Maritime Authority and the extraordinary meetings concerning safety on the mooring deck.

1. “When operating mooring lines, make sure it is possible to see all people on deck, especially forward when operating with remote control”
2. “No standing zones” where AB’s working on the forecastle not are allowed to stand without being under observation by the AB operating the winches

At the meeting, the importance of following the instructions was emphasized.

Furthermore, it was proposed that an officer supervises the mooring on the forecastle from time to time in order to make sure that the work is done safely and in accordance with the adopted rules.

4 Analyses

4.1 *The View*

The deck's arrangement impedes a full view to the winches from an angle where also the hawsers ashore can be seen.

According to the boatswain, the view to the quay is best seen through the opening in the side of the ship approximately from the winches in each side.

When standing next to the winch in one side of the ship, it is not possible to see the winch in the opposite side.

It is not possible to see the winches from the bridge

There was no visual contact between the boatswain and the injured AB from where they were standing respectively when the accident occurred – see sketch on page 7.

The mooring winch in port side caught the AB and pulled him around 2-3 times. It was not until he had come loose of the winch, he was able to advise the winch operator by radio.

The Investigation Division is of the opinion that the poor view was the main cause to the accident. The winch operator was standing in a position where he neither could prevent nor limit the accident by stopping the winch immediately after his colleague had been caught by the hawser.

4.2 *The hawser spooled wryly upon the winch drum*

The hawser spooled wryly upon the outer side of the winch drum. The guide pulley's and the winch's position has the effect that the hawser has a tendency of spooling upon the outer side of the winch drum.

Normally, it is necessary to spool a part of the hawser off again after departure in order to straighten it out.

The hawser caught the AB while he was trying to straighten the hawser out while the winch was being operated.

The Investigation Division is of the opinion that the necessity of pulling the hawser in/out several times is inexpedient (not advisable).

4.3 *Safety zone at the winch*

The limit for the "No standing Zones" (yellow lines) has been painted on the deck. The lines indicate the standing limit when operating the remote controlled winch. At the time of the accident, the lines had been partly erased/painted over.

The lines had not been clearly repainted by mistake

The limit for the "No standing Zones" (yellow lines) were initially painted at the beginning of 2004 on the recommendation of the deck's safety group. However, the instructions about the "No standing Zones" do not appear from the risk assessment.

The AB was standing inside the safety zone as the accident occurred.

4.4 Operational safety instructions

From the ship's risk assessment, among other things, it appears: *when operating with mooring lines make sure it is possible to see all people on deck, special forward when operating with remote control"*

In connection with the accident, the boatswain was operating both winches, and was at the same time easing out the spring line by hand.

The boatswain could neither see the port winch nor the AB.

By operating the port winch without visual contact to the AB, the boatswain did not operate according to the safety instructions.

4.5 Observance of the safety instructions

Normally, the boatswain and the AB on duty do the mooring on their own.

According to the ship's ISM, it is the chief officer who is responsible for the mooring at the forecastle. In connection with the daily arrivals and departures, the chief officer is at the bridge, wherefrom he has a very limited view to the mooring deck.

The Investigation Division is of the opinion that the supervision was not efficient with respect to the crews' observance of the safety instructions.

4.6 Risk assessment

In connection with the initial survey on board in 2003, the Danish Maritime Authority made requirements and remarks to the operational conditions because of the poor view at the forecastle. As a result of the survey, the risk assessment was altered.

Furthermore, it was agreed at a safety meeting in the beginning of 2004 to paint a zone at the winches. This does, however, not appear from the risk assessment.

The Investigation Division is of the opinion that the full instruction is confusing.

5 Conclusion

The main causes to the accident were:

- Poor view
- The operational safety instructions were not followed
- The ship management did not see to it that the safety instructions were observed in a sufficient manner and the supervision of the conditions on deck was not efficient.

The following factors had an influence on the accident.

- The winch operator could not see the port winches, and therefore he did not know that the accident had occurred until after the AB had been pulled around with the winch
- The hawser spooled wryly upon the outer side of the winch drum
- The AB was standing close to the winch and he was straightening it out manually while the winch was in operation
- The boatswain was operating two winches at a time

6 Recommendations and initiatives

The yellow stripes were repainted after the accident.

After the accident, it was agreed at an extraordinary safety meeting on board the ship to only pull one hawser at a time while shortening up in future.

After the accident, the safety group has decided that, in future, an officer will be present intermittently at the mooring to control whether the instructions are followed.

6.1 Risk assessment

The Division for Investigation of Maritime Accidents recommends DFDS and the ship's safety organisations to reconsider the safety instructions for the use of remote controlled winch controls.

7 Enclosure

ISM-SMS Safety management system



CHECK LIST for:

Instruction of Deck Crew

CHECK LIST #

283

Area:

Persons, who take up a key position within the above-mentioned category, shall go through the special instructions described in this reference document. The instructor shall, by his signature, verify that instructions in the different topics have been given, and the instructed shall, by his signature, confirm this.

Name of the instructed:	Signed on as:	Instruction commenced (date):

Topic:	Instructor:	Instructed:	Date /Remarks:
Safety procedures (function descriptions) have been gone trough and the person has participated in a Boat and Fire Drill.			
Handing Over Procedure has been gone trough. (Day man 1)			
Informed about the ship's technical installations, with emphasis on safety and environment protection equipment.			
The ship's routines and standards have been gone trough.			
Instructed in all technical installations on deck, included mooring decks and boat deck.			
A comprehensive tour of the ship has been carried out.			
Shown and instructed in the operation of shell doors and ramps			
Instructed in the Master's regulations regarding social behaviour, etc.			
Informed about the ship's ISM/SMS.			
Gone trough, to the extent necessary, BEK No. 232 from DMA of April 24, 2002.			

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