



**The Bahamas
Maritime Authority**

THE COMMONWEALTH OF THE BAHAMAS

M.v. Skandi Skansen

IMO Number: 9459759

Official Number: 8001928



**Report of the marine safety investigation into a
fatality on an Anchor Handling Supply vessel on 21
February 2015**

The Bahamas conducts marine safety or other investigations on ships flying the flag of the Commonwealth of the Bahamas in accordance with the obligations set forth in International Conventions to which The Bahamas is a Party. In accordance with the IMO Casualty Investigation Code, mandated by the International Convention for the Safety of Life at Sea (SOLAS) Regulation XI-1/6, investigations have the objective of preventing marine casualties and marine incidents in the future and do not seek to apportion blame or determine liability.

It should be noted that the Bahamas Merchant Shipping Act, Para 170 (2) requires officers of a ship involved in an accident to answer an Inspector's questions fully and truly. If the contents of a report were subsequently submitted as evidence in court proceedings relating to an accident this could offend the principle that a person cannot be required to give evidence against themselves. The Bahamas Maritime Authority makes this report available to any interested individuals, organizations, agencies or States on the strict understanding that it will not be used as evidence in any legal proceedings anywhere in the world.

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1 GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AB	Able Body Seaman
AHT	Anchor Handling Towing
BMA	Bahamas Maritime Authority
CCTV	Closed-Circuit Television
CP	Controllable Pitch
CPR	Cardiopulmonary Resuscitation
DNV	Det Norske Veritas
KG	Kilogram
kW	Kilowatt
mm	Millimeter
PPE	Personal Protective Equipment
PTW	Permit to Work
SWL	Safe Working Load
TBT	Toolbox Talk
UTC	Universal Time Coordinated

All times noted in the report are given in the style of the standard 24-hour clock without additional annotation and as local time in Norway, which was UTC +1.

2 SUMMARY

- 2.1 On 21 February 2015, the vessel was berthed alongside Standkaien (Beach Quay) in Stavanger Harbour, Norway.
- 2.2 At 1200 hours the vessel received a work instruction from DOF Subsea Office to mobilize the vessel for a forthcoming anchor handling charter.
- 2.3 The operation entailed replacing the starboard side 105mm Gypsy¹ from the main Anchor Handling Towing (AHT) winch with an 84 mm Gypsy, to suit the impending charter.
- 2.4 The starboard side 105 mm Gypsy was removed from the AHT winch without any incident.
- 2.5 When moving the 84mm Gypsy into a preliminary position for manual transportation to the starboard side of the AHT winch, the Gypsy tilted and fell trapping and crushing an Able Body Seaman between the Gypsy and the starboard side bulkhead.
- 2.6 The casualty was freed when the Gypsy was lifted clear. However, efforts by the ships complement including the ambulance medics were unable to revive him.
- 2.7 He was subsequently pronounced deceased on arrival at the local hospital.

¹ Gypsy – Wheel with machined pockets used for lifting chains on a winch.

3 DETAILS OF INVOLVED VESSEL(s) AND OTHER MATTERS

3.1 Details of vessel

3.1.1 Skandi Skansen is a versatile multipurpose construction anchor handling vessel built at STX OSV, Romania and registered in the port of Nassau, Bahamas. The accommodation and machinery spaces are situated forward with an open deck layout aft.

3.1.2 The vessel had the following principal particulars:

Call sign	C6ZK9
IMO number	9459759
MMSI number	311058200
Built	2011
Length overall	107.20 metres
Length between perpendiculars	98.0 metres
Breadth	24.0 metres
Depth moulded	9.80 metres
Propulsion power	23860 kW
Gross registered tonnage	8222 tonnes
Net registered tonnage	2467 tonnes
Type	AHTS construction field support vessel
Bollard Pull	350 tonnes
Class Notation	DNV GL 1A1, SF, SUPPLY VESSEL, TUG, E0, DYNPOS-AUTR IMO DPII

3.1.3 The vessel has 2 Controllable Pitch propellers and is powered by 4 diesel-electric engines developing 10,400 kW.

3.1.4 Skandi Skansen is suited for deep-water mooring and field installation operations. The vessel has a working deck area of 1,070m² and has additional operating capabilities including a moon pool² and a 250-tonne crane.

3.1.5 At the time of the incident, the vessel was owned by DOF Installer ASA and managed by DOF Management AS.

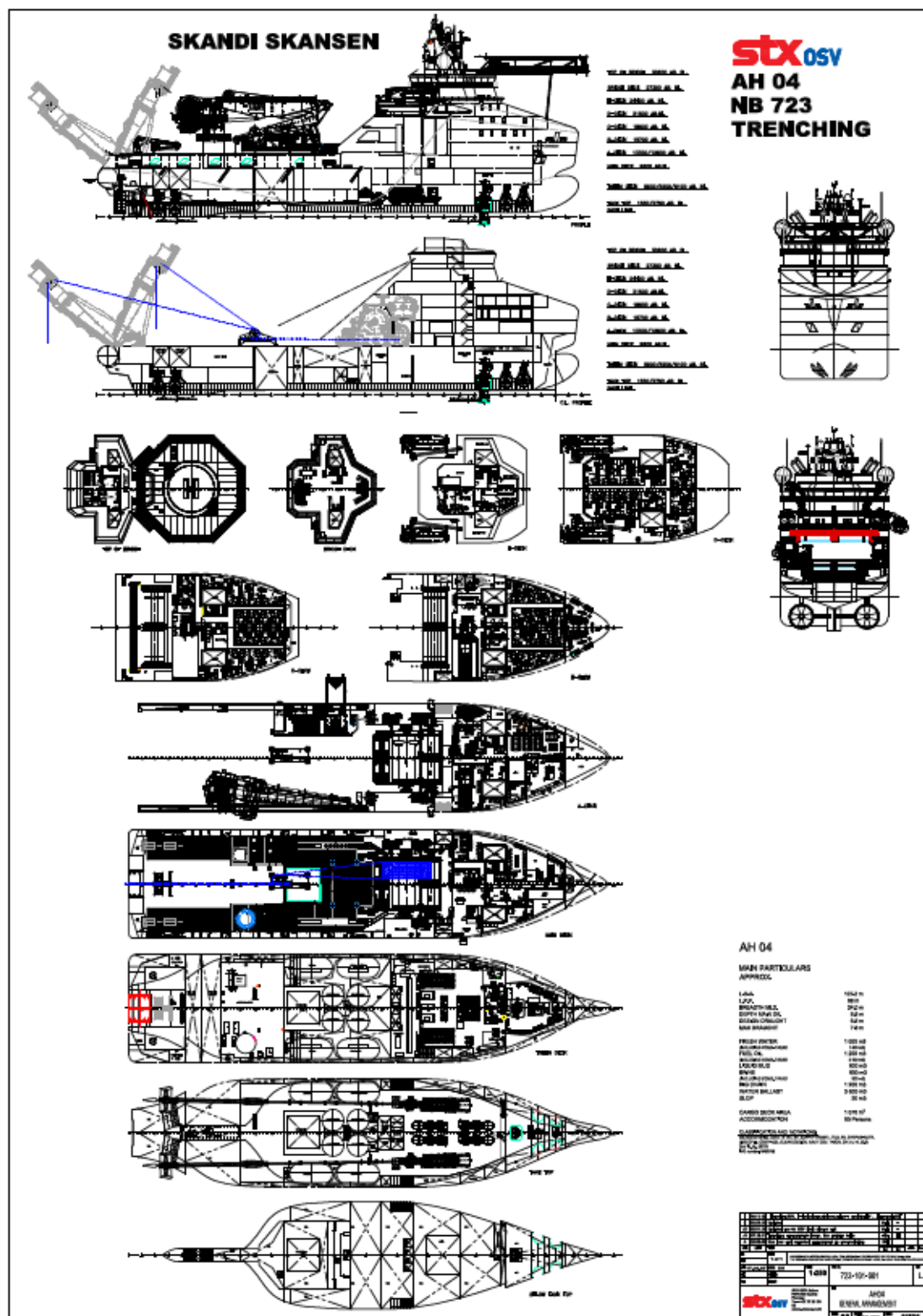
3.2 Vessel Certification

3.2.1 Skandi Skansen was first registered with the Bahamas Maritime Authority (BMA) in 2011 and was classed with DNV GL Classification Society. At the time of incident, the vessel complied with all statutory and international requirements and certification.

3.2.2 The vessel was subjected to a Bahamas Maritime Authority Annual Inspection at the Port of Sandnes, Norway on 15 September 2014. No deficiencies or observations were identified.

3.3.3 The vessel had a Port State Control Inspection at the Port of Lerwick on 13 September 2014 with no deficiencies identified.

² Moon pool – An opening in the hull through which equipment can pass.



4 NARRATIVE OF EVENTS

- 4.1 On 21 February 2015, the vessel was berthed alongside Standkaien (Beach Quay) in Stavanger Harbour, Norway.
- 4.2 At 1200 hours the vessel received a work instruction from DOF Subsea Office to mobilize the vessel for an anchor handling task which required replacing the 105mm Gypsy with an 84mm Gypsy.



Figure 2: 84mm Gypsy



Figure 3: 105mm Gypsy

- 4.3 The deck crew was engaged in replacing the starboard side AHT Winch Cable Gypsy (Chain lifter) by removing the 105mm Gypsy and installing the smaller 84mm Gypsy which weighed approximately 2492 KG.
- 4.4 The 105mm Gypsy was uninstalled and transferred to a storage area on the main deck without any incident.
- 4.5 The Deck crew then connected the lifting sling to the 84mm Gypsy using the main crane whip line with a safe working load (SWL) of 20 tonnes at 40 meters.



Figure 4: Crane (20-tonne) for lifting Gypsy

- 4.6 The 84mm Gypsy was released and lifted from the stowage area. It was then lowered landing longitudinally aft of the starboard side AHT winch on the deck hatch cover between the chain hauler guide rails.
- 4.7 The crane sling was disconnected and the five (5) deck crew began to roll the Gypsy forward.
- 4.8 One rim of the Gypsy dropped into the starboard side chain hauler guide rail and became unbalanced, it immediately tipped over falling towards two (2) of the deck crew standing on the starboard side.



Figure 5: Chain hauler guide rails

- 4.9 One (1) of the deck crew was caught between the Gypsy and the bulkhead as indicated by the arrow within figure 6 below. The Gypsy struck the crew member on the chest, pinning him to the bulkhead. Several members of the crew who witnessed the incident immediately attempted to free the crew member by lifting the Gypsy but due to its weight, were unable to do so.



Figure 6: Location of crew member trapped between Gypsy and bulkhead

- 4.10 The slings were reconnected and the crane was used to lift the Gypsy clear, freeing the crew member. Immediately the crew member slipped to the deck and was unresponsive.
- 4.11 The vessel's first aid team administered cardiopulmonary resuscitation (CPR) until shore side medical assistance arrived. The casualty was taken by ambulance to a local hospital and was declared deceased shortly after arriving at the hospital, approximately 40 minutes after the incident.

5 ANALYSIS AND DISCUSSION

5.1 Equipment Handling

- 5.1.1 When the crane hook and slings were connected to the Gypsy, the crane hook was not directly above and in line with the center of the Gypsy. Therefore, when the crane lifted the Gypsy it swung out into the working area.
- 5.1.2 There were no guide-lines or chain block attached to the Gypsy to control swing or careful positioning of the Gypsy on the hatch cover when lifting or lowering.
- 5.1.3 When the Gypsy was finally landed longitudinally, it was not landed in its intended location. Instead, it was landed to starboard of its intended position with the starboard side Gypsy rim on the edge of the chain hauler guide rail.

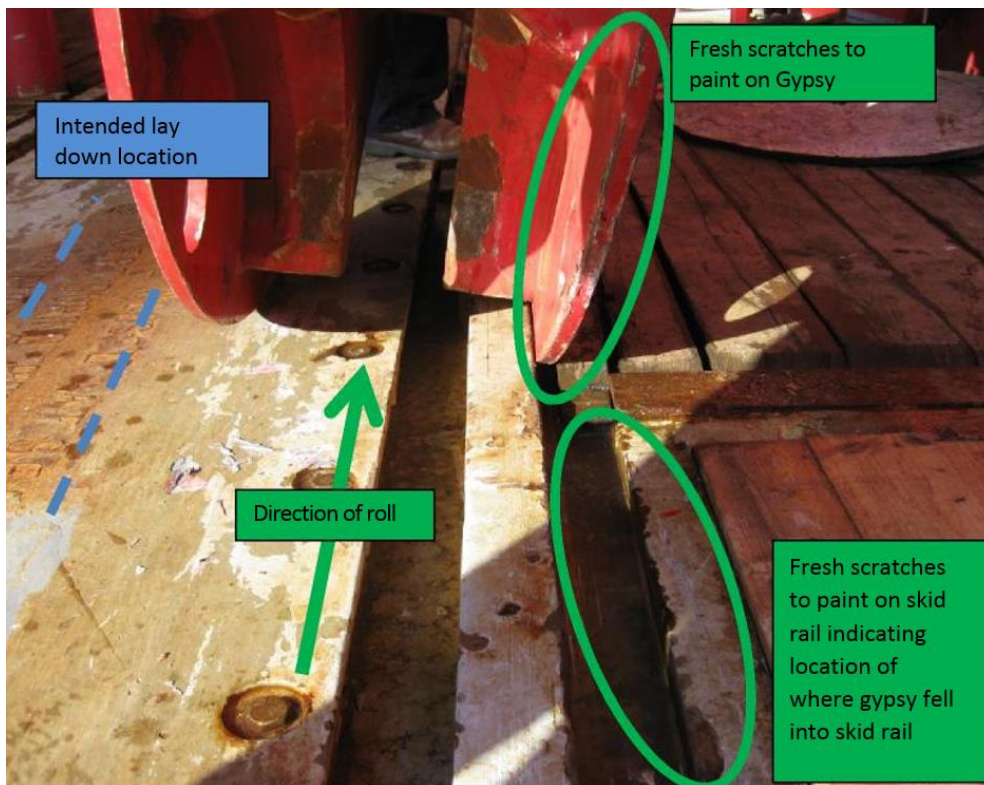


Figure 7: Demonstration of Gypsy dropped into the starboard side guide rail

- 5.1.4 From the evidence collected it was observed that none of the deck crew were concerned with the positioning of the Gypsy, they were all concentrating on manually steadying the Gypsy in a vertical plane (weighing 2492 Kg) and disconnecting the crane hook.

- 5.1.5 There were no personnel on deck supervising the operation of lifting, landing or manual handling the Gypsy and no Officer on the bridge monitoring the actions of the crew on deck via the CCTV monitors.

5.2 Risk assessment

- 5.2.1 A Toolbox Talk³ and risk assessment were carried out prior to commencing the operation by the Crane Driver (refer [Appendix I](#) and [Appendix II](#)).
- 5.2.2 The TBT was convened involving all six members (Bosun, Crane Driver and 4 AB's) involved in the operation to change the Gypsy.
- 5.2.3 Incorporated within the TBT (refer [Appendix I](#)) the following issues were identified and discussed:
- Type of operation to be executed.
 - Methods/procedures to be adopted.
 - Permit to Work⁴ precautions /controls.
 - Safety equipment location.
 - Individual responsibilities for control.
 - Work equipment.
 - Manual handling.
 - Environmental considerations.
 - Barriers / No Go Areas.
 - Rescue plan.
- 5.2.4 Good communication was specifically recognised as an additional control measure required to control the hazards identified within the TBT assessment checklist.
- 5.2.5 Absent from the TBT was the identification of any potential hazards associated with moving a Gypsy. The TBT provided a prompt to remind the responsible person briefing to discuss areas which may prove to be a hazard identified within the risk assessment. The risk assessment conducted was for working at height and had no direct relation to hazards or risks associated with moving a Gypsy. Therefore, had a member of the crew handling the Gypsy identified the potential for the Gypsy to fall, they would have done so without the benefit of an adequate risk assessment.
- 5.2.6 The Permit to Work issued was valid from 1300hrs until 1700hrs (refer to [Appendix III](#)) and had been approved by the Bosun and authorised by the 1st Officer. The Permit to Work was in force approving the Bosun to commence the operation of changing the Gypsy. When read in conjunction with the Risk Assessment it concludes that the operation of the crane, as a function of working at height, was the most hazardous aspect of the task to be conducted.

³ Toolbox Talk– A short safety talk to identify possible risks of the forthcoming activity.

⁴ Permit to Work- A formal management system used to minimise risk.

5.2.7 The description of hazards identified did not have hazards related to the chain hauler guide rails, the hatch cover coaming or the risk of manual handling of a Gypsy weighing 2492 kg.

5.2.8 There was no documented procedure for manual handling either for removal or refitting of a Gypsy for the AHT winch.

5.3 Weather conditions

5.3.1 There was no indication that the weather, sea state, swell or any other meteorological factor influenced the outcome of this incident.

6 CONCLUSIONS

- 6.1 The primary contributing factor which resulted in the fatality of the AB was concluded to be due to insufficient safe working procedures and an inadequate risk assessment to identify the hazards posed when manual handling the Gypsy on deck.
- 6.2 The only method available to the ship and crew to change out the AHT winch Gypsy was to roll it over the deck.
- 6.3 The hazard related to rolling any heavy objects in the vicinity of the chain hauler guide rails and the hatch cover coamings was not identified during the risk assessment of the task.
- 6.4 Had an adequate risk assessment been conducted, the risk associated with this task could have been identified before the task was initiated.

7 RECOMMENDATIONS

Recommendation for the operator:

- 7.1 It is recommended to develop an effective safe working procedure for the manual handling of the Gypsy on deck.
- 7.2 It is recommended to review the risk assessment and permit to work procedures to facilitate an effective identification of hazards and mitigation of risks related to the handling of the Gypsy and associated equipment.
- 7.3 It is recommended to consider each task as a separate operation if more than one task is scheduled to take place involving manual handling of heavy equipment.

Appendix I: Toolbox Talk



Toolbox Talk Assessment / Checklist

All Personnel involved in the work activity must participate in the Toolbox Talk (TBT) and sign below as being present. The TBT objective is to communicate the Risk Assessment and capture any specific controls not already identified to the work party.					
Work Location: <u>STBD SIDE M/DECK</u>			Work Activity: <u>CHANGE CABULAR</u>		
Date: <u>21.2.15</u>			Discipline: <u>AB</u>		
Permit, Work Instruction or Procedure No: <u>037979</u>			Risk Assessment, Lift Plan, COSHH or Manual Handling No: <u>RA 21.006</u>		
CHECKLIST/PROMPT (Tick where appropriate)					
<input checked="" type="checkbox"/>	Type of operation to be executed	<input checked="" type="checkbox"/>	Work equipment	<input checked="" type="checkbox"/>	Hazardous substances used/present
<input checked="" type="checkbox"/>	Methods/procedures to be adopted	<input checked="" type="checkbox"/>	Production/operational constraints	<input checked="" type="checkbox"/>	Isolation requirements
<input checked="" type="checkbox"/>	PTW precautions/controls	<input checked="" type="checkbox"/>	Human factor assessment	<input checked="" type="checkbox"/>	Conflicting activities
<input checked="" type="checkbox"/>	Safety equipment location	<input checked="" type="checkbox"/>	Crane/lifting requirements	<input checked="" type="checkbox"/>	Environmental considerations
<input checked="" type="checkbox"/>	Individual responsibilities for controls	<input checked="" type="checkbox"/>	Confined space entry requirements	<input checked="" type="checkbox"/>	Waste management
<input checked="" type="checkbox"/>	Access/egress	<input checked="" type="checkbox"/>	Manual handling	<input checked="" type="checkbox"/>	Working environmental conditions
<input checked="" type="checkbox"/>	Tests/monitoring	<input checked="" type="checkbox"/>	Potential hazards	<input checked="" type="checkbox"/>	Barriered / No Go Areas
ADDITIONAL CONTROL MEASURES NEEDED TO CONTROL ABOVE HAZARDS					
<u>GOOD COMMUNICATION,</u>					
OPERATIONS SUMMARY					
<u>CHANGE CABULAR</u>					
EQUIPMENT SUMMARY					
<u>SAFETY HARNESS, HAND TOOLS</u>					
<u>PPE, BARRIER, CHAIN BLOCKS</u>					
SAFETY TOPICS / RESCUE PLAN DISCUSSED					
<u>SLIPS, TRIPS, FALLS, DROPPING OF TOOLS</u>					
ATTENDEES					
Print Name		Signature		Print Name	
Bosun		AB		AB	
Crane Driver		AB		AB	
AB		AB		AB	
TALK CONDUCTED BY					
Planned By	Print Name:	Signature:	Date:	<input checked="" type="checkbox"/> Procedures <input checked="" type="checkbox"/> Risk Assessment <input checked="" type="checkbox"/> Other Documents	
	Bosun		21.2.15		
Talk Carried Out By	Print Name:	Signature:	Date:		
	Bosun		21.2.15		

Appendix II: Risk Assessment

Document title
Working in Height
Document No: RA-21.006 Rev. No: 1.01 Date issued: 09/08/2012



Job Steps	HAZARD		INITIAL RISK			CONTROLS	RESIDUAL RISK		
	Hazard Description and Effect	Population at Risk	Hazard Severity	Likelihood	Risk Rating	List all Controls Required	Hazard Severity	Likelihood	Risk Rating
Separate the job into individual tasks and record in sequence.	Describe all hazards identified and their effects for each task (from Hazard ID checklist and based on observations and experience). Additional hazards may be caused by interaction with other work.	Name all types of personnel at risk. Remember to include people outside the work party who may be affected.	From matrix, identify severity with no controls in place for each hazard.	From matrix, identify likelihood with no controls in place for each hazard.	Classify risk rating from matrix for each hazard.	Describe fully all controls applicable for each hazard eg if additional PPE (beyond standard) is used as a control, it must be specifically described. If a control can only be verified by documentation then it must be available. All controls must be valid in that they reduced severity, likelihood or both.	From matrix, identify severity with controls in place for each hazard.	From matrix, identify likelihood with controls in place for each hazard.	Classify risk rating from matrix for each hazard.
Working at a Height	Fall Injury caused by: 1. Working outside guardrails at height. 2. Poor supervision. 3. Incorrect PPE Procedures followed. 4. Nervousness	Ships crew Service men.	4	4	16	1. Work carried out under PTW 2. Correct PPE including safety harness. 3. Fall arrest equipment if required. 4. Trained competent personnel. 5. Only personnel not afraid working in height to perform working in height tasks.	4	1	4
Working at a Height	Struck caused by: 1. Dropping Tools at Worksites. 2. Poor communication with other personnel in area. 3. Misunderstanding. 4. Walking into danger 5. Other personnel unaware of person working aloft	Ships crew Service men.	4	4	16	1. Tools to be stowed in safe container, 2. Tools secured with lanyard. 3. Barrier of the unsafe area beneath. 4. Radios or designated person to watch personnel working aloft and warn other personnel away from area. 5. If working in radar mast, warning to be displayed on the radar at bridge. 6. Trained, competent personnel.	4	1	4
Working at a Height	Movement of equipment in the area causes injury / Collision caused by: 1. Equipment not isolated. 2. Poor supervision.	Ships crew Service men.	4	3	12	1. Work carried out under PTW system complete with Isolation Certificates. 2. Trained competent personnel. 3. Toolbox talk / planning.	4	1	4

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Document title
Working in Height
Document No: RA-21.006 Rev. No: 1.01 Date issued: 09/08/2012



	3. Incorrect Permit to Work procedures.					4. Spotters placed at various positions to monitor possible collision zones.			
Working at a Height	Environment. Slip trip, fall caused by bad weather conditions	Ships crew Service men.	4	3	12	1. Trained and competent officer to assess weather conditions at time.	4	1	4
Participants:			Date: 21.02.15 Review date:						

[Click here to view Risk Assessment Matrix.](#)

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Appendix III: Permit to Work

 Permit to Work		Permit no: 037979	
<input type="checkbox"/> Hot work <input type="checkbox"/> Work on hydrocarbon system <input type="checkbox"/> Isolation		<input type="checkbox"/> Weld operation <input checked="" type="checkbox"/> Working at height <input type="checkbox"/> Entry (confined space)	
<input type="checkbox"/> Dangerous/hazardous substances <input type="checkbox"/> Other:		Position/name: Area Authority: Bosun Area Technician: Gas Tester:	
Permit Holder: _____ Ph./UHF ch: 121 Work description: CHANGE CABULAR		Date: 21.2.15 From hr 1300 to hr 1700 Extended to hour: Area Authority (sign): Issuing Authority (sign): Area Technician (sign):	
Equipment/tools: S/HARNES, LADDER, HAND TOOLS Dept./Discipline: AB Area / location: STR-D Deck: MAIN Attachment: TBT/RA		<input type="checkbox"/> Requires approval from engine room <input type="checkbox"/> Requires isolation <input checked="" type="checkbox"/> Risk Assessment ref. no: RA-21006	
Operations and Safety preparations			
A: Required performed by Area Technician <input type="checkbox"/> Depressurization <input type="checkbox"/> Draining/emptying <input type="checkbox"/> Cleaning/gas freeing <input type="checkbox"/> Isolation by single valve/double block & bleed <input type="checkbox"/> Isolation by blind/isolation plan <input type="checkbox"/> Safety tag/lock <input type="checkbox"/> Venting/Extra ventilation <input type="checkbox"/> Prevent release of oil/gas in the area <input type="checkbox"/> Measures against radioactive radiation <input type="checkbox"/> Inspection of the area every _____ hour <input checked="" type="checkbox"/> Toolbox Talk <input type="checkbox"/> Other:		B: Required Performed by Permit Holder <input type="checkbox"/> Portable gas detector no. _____ on the worksite <input type="checkbox"/> Verify mechanical isolation <input type="checkbox"/> Electrical isolation/locking Tag no. <input type="checkbox"/> Fire Extinguisher/fire prevention <input type="checkbox"/> Welding machine safely located and earthed <input type="checkbox"/> Continuous guard/radio communication <input type="checkbox"/> Drains blocked/covered <input type="checkbox"/> Barrier/warning sign/PA-announcement <input type="checkbox"/> Cooperate with Bridge/Area technician <input type="checkbox"/> Follow requirements for work above sea/at height <input type="checkbox"/> Chemical data sheet known and available <input type="checkbox"/> Procedures/checklist for the operation known Ref no: <input type="checkbox"/> Control of temporary lifting equipment <input type="checkbox"/> Follow requirements for Entry (confined space) <input type="checkbox"/> Special personal protective equipment <input checked="" type="checkbox"/> Other requirements/preparations: PPE	
System Isolation: <input type="checkbox"/> Mechanical <input type="checkbox"/> Electrical Isolation certificate nr:		Isolation Safety System: <input type="checkbox"/> Locally <input type="checkbox"/> Bridge System: Location/sensors/fire sensors no.: Compensating measures:	
Approval / Authorisation of work			
Area Authority: Bosun		Master/Responsible Officer: 1st Officer Time: 13:10	
Remarks/requirements:			
Precautions prior to / during work execution			
Remarks:		Gas test value	
Enclosed space:		Time:	
HCL/L:		Time:	
O2:		Time:	
H2S:		Time:	
Other:		Time:	
Sign:		Time:	
Permit Issue			
Precautions (section 4) and safety preparations (section 2b) are implemented and will be fulfilled: Permit Holder (time and sign): 1200		Work site prepared according to requirements in section 2 and 4. Area Authority (sign): Bosun	
The work is approved by Bridge: Issuing Authority (sign): 1st Officer			
Completion			
<input checked="" type="checkbox"/> Work completed <input type="checkbox"/> Work not completed <input type="checkbox"/> Work place cleaned & secured Permit Holder (time and sign): 1700		All locks/tags removed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Equipment ready for operation <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Area Authority (sign): Bosun		Issuing Authority (sign):	
Original: Permit holder: Work site Yellow: Bridge Pink: Area Auth./Permit Board			

Appendix IV: Deck Log Book Extract

13:00	CANNON BY ON STARBOARD LOW-WIND
14:00	APPROX 16:00 HRS AN OFFICER CALLED THE CAPTAIN AND INFORMED ABOUT A SERIOUS ACCIDENT ON MAIN DECK. 1 HS HAD SUSTAINED A CRUST INJURY.
16:02	CAPTAIN CALLED "113" EMERGENCY NUMBER TO "VAKCENIRMAN".
16:05	MARINE CREW CONDUCTED FIRST AID INCL CPR. UNTIL THE AMBULANCE AND POLICE ARRIVED.
16:07	(APPROX) THE AMBULANCE ARRIVED AND TOOK OVER. THE EMERGENCY TEAM AND POLICE CONTINUED TO "WORK" ON THE I.P.
16:50	(APPROX) HE WAS TAKEN TO THE HOSPITAL. SHORTLY AFTER ARRIVING AT THE HOSPITAL HE WAS PRONOUNCED DEAD.
16:20	DOF EMERGENCY NUMBER WAS CALLED 16:20 HRS.

Signed (date):

24 02 2015