

Casualty Investigation Report CA - 63

Fatal Accident in Heavy Weather, 2nd March 2000

Johann Schulte

***Isle of Man Government
Marine Administration***

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Part 1

Summary

- 1.1 On Thursday March 2nd 2000 one crew member lost his life and four other crew were injured, three of them seriously aboard the Isle of Man registered ship “ Johann Schulte ”. The ship was in mid - Atlantic on passage from Sines in Portugal to Houston, Texas in the United States when it was struck by two waves which crashed over the forecastle. The incident occurred while the Chief Officer, Bosun and four seamen were attempting to secure the anchors on the forecastle deck.
- 1.2 One crew member survived the incident without injury and made his way aft to raise the alarm. At the same time the officer of the watch noticed some unusual activity forward and informed the Master. Subsequently a rescue effort was mounted by the 3rd Officer and the ship’s engineering staff to retrieve the injured crew members from the deck and evacuate them to the safety of the accommodation. During this rescue attempt it was found that the Chief Officer had died from his injuries and his body was later recovered to the accommodation. The 2nd Officer took charge of the first aid and subsequent medical treatment of the injured.
- 1.3 After informing the Company who put into action their emergency response programme, radio medical advice was sought from the United Kingdom and U.S. Authorities. Contact was established with the Rescue Co-ordinating Centres of Miami, Norfolk and Bermuda. A large scale medical evacuation rescue plan was put into operation in order to evacuate the injured crew from the ship. Two Black Hawk HH - 60 helicopters supported by two C -130 refuelling transport aircraft from the United States Air Force flew the first leg of the rescue mission from an air base in Georgia, USA to Bermuda. Despite the valiant efforts of the crew another seaman died of his injuries on the following day Friday 3rd March 2000. A second flight was then undertaken to rendezvous with the ship some 470 miles east north east of Bermuda on Friday 3rd March. Three injured crewmen were successfully lifted from the ship and evacuated to Hamilton, Bermuda.
- 1.4 The “Johann Schulte” continued to the port of Hamilton, Bermuda where she anchored on Sunday evening 5th March 2000. The following day the ship berthed at Kings Wharf, Dockyard, Bermuda and after formal identification of the deceased, the two bodies were removed from the ship for post mortem examinations.

Part 2

Details of the Ship

- 2.1 The “Johann Schulte” is a type 2G semi refrigerated liquefied petroleum gas carrier fitted with six individual gas tanks in three holds and two gas deck tanks which are situated port and starboard on the main deck above the No.1 gas tanks.
- 2.2 The ship was built as hull number 2230 at CSSC Jiangnan Shipyard, Shanghai, China and delivered to the Schulte Group on the 20th February 1998. The ship was registered in the Isle of Man on the same date and is managed by Dorchester Maritime Limited whose offices are at Thornton House, Douglas, Isle of Man. Dorchester Maritime is also responsible for the technical management of the ship.
- 2.3 The ship is manned by Polish officers and Philippines ratings, the Safe Manning Certificate is issued for a total of 15 crew. At the time of the incident there were 19 crew on board.

IMO Number	9155341
Official Number	730477
Call Sign	MXQO 5
L.O.A.	154.95m
L.B.P.	147.48m
Breadth moulded	23.10m
Depth moulded	12.70m
Gross Tonnage	15,180
Nett tonnage	4,785
Lightship	8,657
Deadweight	18,062
Cubic Capacity	16,500cu.m
Machinery	Diesel - Sulzer 6RTA 52U (UMS)
Power	9360 kW @ 135 rpm
Service speed	16 knots
Classification	Germanischer Lloyd
Draft	Forward 8.40m, Aft 8.70m
Height of eye	18.40m
Bridge to Bow	121.51m

Part 3

Sequence of Events

- 3.1 The “Johann Schulte” departed Sines, Portugal on Saturday 26th February 2000 for Houston, Texas with a cargo of Butadiene and C-4 crude Butane. The full away on passage being recorded at 0200 hours local time. The anchors were secured at 0215 hours, this fact was recorded in the Deck Log book and movements “Bell” book. The ship was not weather routed. However, as a precaution it was decided not to pass north of the Azores in case of encountering bad weather in the north Atlantic. The passage plan routed the ship on a rhumb line from Sines to the Azores and then a great circle passage was planned to route the ship to the North Providence Channel in the Bahamas.
- 3.2 During the evening of the 1st March 2000 the Bosun was reportedly ordered by the Chief Officer to go forward and tighten the securing wires for the anchors. He and an Ordinary Seaman proceeded forward and heard both the port and starboard anchors banging against the ship’s hull when the seas struck the bow. They tightened the securing wire bottlescrews on each anchor cable position and returned to the accommodation.
- 3.3 At midnight (24.00 hours) on the 1st March the ship was proceeding at normal full speed and experiencing moderate weather conditions from the south west of approximately force 5 causing the ship to pitch moderately. The 2nd Officer relieved the 3rd Officer as officer of the watch at 0040 hours local time to coincide with the clocks being retarded by one hour. A normal hand over of the watch was completed.
- 3.4 The weather conditions deteriorated rapidly during the early part of the midnight to 0400 hours watch. The 2nd Officer retarded the clocks by one hour at 0200 hours. At approximately 0145 hours the officer of the watch was contacted on the telephone by the Chief Engineer who was in the Engine Room. The heavy weather had woken the Chief Engineer at about 0130 hours and he went below to check on the main engine where he found the engine load too great. This instigated the telephone call to the bridge upon which he requested the officer of the watch to reduce speed to 120 rpm. Before the Chief Engineer completed his duties the duty engineer arrived in the Engine Room in order to cancel an alarm. The duty engineer was informed by the Chief Engineer the ship had reduced to 120rpm. Both officers departed the Engine Room shortly after 0200 hours.
- 3.5 Meanwhile the 2nd Officer continued his watch maintaining the course and speed at 255 degrees true and 120 rpm respectively in the heavy weather. The Deck log book entry at the end of his watch describes the weather as being south south - west force 8 to 9, vessel pitching heavily, shipping seas forward and spraying overall. At 0400 hours the 2nd Officer was relieved by the Chief Officer. They discussed the present weather conditions and from the weather facsimiles the likely sequence of weather to affect the ship. The Chief Officer was informed of the earlier reduction in speed. No mention was made to the 2nd Officer at this stage of any intention to check the forecastle or securing arrangements forward. The 2nd Officer stated he left the bridge at 0410 hours to carry out the safety rounds.

- 3.6 The Master woke about 0420 hours and went to the bridge to check on the weather as he thought the ship was pitching heavily. The Chief Officer and the Master discussed the weather situation and agreed a further reduction in speed was necessary. To facilitate this reduction the Master telephoned the duty engineer (3rd Engineer) who in turn telephoned the Chief Engineer to confirm the limit of the reduction in speed. The duty engineer went below to carry out these duties and when completed returned to his cabin. The speed was eventually reduced to 115 rpm to remain above the revolutions required for use of the shaft alternator.
- 3.7 The Master now remained on the bridge until 0715 hours and spent his time between the wheelhouse and radio room to monitor the ship's performance, complete paperwork and prepare outgoing radio messages. During his time on the bridge the Master held several conversations with the Chief Officer and they discussed the weather and the possibility of checking conditions forward for the safety of the vessel and securing of anchors. Nothing specific was agreed between either officer as to when or how this would happen nor was it agreed as to whether any crew would be sent forward. The Master left the bridge at 0715 for half an hour to have his breakfast.
- 3.8 When the Master returned to the bridge at 0745 hours no further mention was made of their previous discussions. The Master remained on the bridge while the Chief Officer handed over the watch to the 3rd Officer. There was a normal exchange of information, with reference to the reductions in speed during the night and the deteriorating weather conditions. The Chief Officer recorded the weather in the deck log book as being south westerly force 8 with the vessel pitching heavily and shipping seas on deck. The 3rd Officer was not informed at any stage during this hand over of whether the Chief Officer or any crew proposed going forward. The Chief Officer left the bridge for his breakfast followed shortly afterwards by the Master who returned to his cabin where he remained until a telephone call from the bridge.
- 3.9 Meanwhile the off going 0400 / 0800 watch rating met the 0800 / 1200 watch rating in the crew changing room about 0800 hours where the watch VHF radio was handed over. The 0400 / 0800 watch rating reported he had been forward on deck to check an alarm in the deck store which is situated at the forward end of the Compressor House. As he left for breakfast the Bosun appeared and ordered the 0800 / 1200 watch rating to prepare for going forward, however, he said they would wait for the Chief Officer. It was not mentioned at this stage why they were required go forward. For whatever reason the Bosun, an AB and an Ordinary seaman proceeded forward and waited between the No.1 Deck tanks. The two seamen waited there while the Bosun returned aft to find the Chief Officer. At no time was the Officer of the Watch informed about the proposed movements on deck.
- 3.10 After leaving the bridge the Chief Officer had his breakfast, then shortly afterwards was seen by the Gas Engineer at about 0820 hours as he passed through the Cargo Control Room on his way out onto the deck. A brief conversation took place between the two officers in which the Chief Officer reportedly told the Gas Engineer he was going forward to check the anchors. The Gas Engineer made the observation that the weather was very bad on deck. He had previously been on deck to work in the Compressor Room prior to meeting the Chief Officer. However, the Chief Officer then left by himself to meet up with the Bosun somewhere on the fore deck.

- 3.11 The Chief Officer met the Bosun and they proceeded forward where they in turn met up with the two seamen sheltering between the Deck tanks. The Chief Officer now told the Bosun according to one of the seamen, that it was necessary to check the anchors. The Chief Officer and the three seamen went forward through the weather breakwater bulkhead access onto the forecastle. The port anchor cable was found to be slack and while the crew attempted to heave tight the anchor the securing wire around the anchor cable became slack. The securing wire was passed through another link in the anchor cable, however, the wire was now too short to re-secure the cable. Meanwhile two more seamen arrived on the forecastle to assist with the work and they were ordered to check the securing arrangements on the starboard anchor cable and if required re-secure those lashings.
- 3.12 At approximately 0840 hours two waves struck the ship. The force of these waves shook the ship violently as reported by several crew members in the accommodation and engine room. As the ship pitched into the oncoming first wave one of the seaman had just enough time to move behind the port windlass and grab hold of a ventilator trunk. The other crew were thrown by the force of the two waves landing on the forecastle deck over the weather breakwater bulkhead landing in various positions some 20 metres further aft. The Chief Officer landed on the port side of the main deck against the ship's side rails adjacent to No.1 port side deck tank. Two of the seaman came to rest between the deck tanks one at the forward end and inside the well and the other at the aft end outside the well. The third seaman landed aft of the starboard deck tank adjacent to the ladder which leads to the deck access companionway. The Bosun was apparently thrown in the air however, he did not clear the weather breakwater due possibly to striking the foremast or the safety ring surrounding the foremast ladder. He landed on the forecastle deck beneath the foot of the foremast and behind the windlass control box stand.
- 3.13 As the water cleared from the forecastle the one seaman who had held onto the ventilator trunk made his way aft down the starboard side of the main deck to raise the alarm. He observed two of his injured colleagues lying by the aft side of No.1 starboard deck tank as he ran past. As the Gas Engineer emerged from the Compressor House he noticed the seaman running down the deck waving his arms. The seaman told the Gas Engineer what had happened and they returned to the No.1 deck tank area.
- 3.14 The Master was in the bathroom as the waves struck and was aware of a particularly heavy shudder vibrating through the ship. The 3rd Officer unaware of any crew on the forecastle was in the chartroom when these waves were shipped over the bow. A few minutes later the 3rd Officer telephoned the Master from the bridge and reported sighting something unusual lying on the deck, furthermore he was unable to contact his watchman on the radio. The Master made his way immediately up to the bridge, shouting through to the Chief Engineer on his way past to the stairway. Once there the 3rd Officer repeated his story and added that he had also telephoned the Engine Room asking the 2nd Engineer for assistance. Even with the use of binoculars it was not possible in the weather conditions to identify what or who was lying on the main deck close to the port side railings in the vicinity of the port deck tank. The Master ordered the 3rd Officer down to the main deck to establish the exact nature of the problems. The Chief Engineer then arrived on the bridge to find out what was the problem.
- 3.15 On receipt of the telephone call from the 3rd Officer the 2nd Engineer collected his staff of two oilers and a fitter, and immediately went up on deck. They initially attempted to access the

deck on the port side however, the weather conditions were too severe and they proceeded onto the foredeck via the starboard side. Once up by the deck tanks they met the Gas Engineer and the seaman attending to three of the injured crew. The 2nd Engineer suggested the Gas Engineer should inform the bridge from the Compressor Room what had happened while he and the other crew present begin evacuating the injured to the accommodation.

- 3.16 The 3rd Officer now arrived on the foredeck and confirmed to the Master that three crew members were injured in the vicinity of the deck tanks and that a number of crew were attempting to evacuate them to the accommodation. He informed the 2nd Engineer that another person appeared to be lying out on the port side by the railings. The Master was very much concerned with this person lying close to the ship's rails on the port side. Conditions on the port side of the foredeck beyond the lee of the deck tanks were considered to be very bad. The two officers had a look from behind the port deck tank and observed the person lying face down against the rails. The 3rd Officer went aft to collect a harness and lifeline.
- 3.17 Meanwhile the Master had ordered the Chief Engineer to organise the changeover to manoeuvring revolutions. It was now about 0900 hours and the Master ordered a reduction in speed and an alteration in course to allow the Officers on deck to rescue the injured person by the port side rails. The Master also called the 2nd Officer informing him of the situation on deck and ordering the hospital to be opened up to receive the injured crew members.
- 3.18 With the alteration of course the seas stopped coming onto the deck and once secured the 3rd Officer crawled out onto the deck and over to the person face down against the rails. He rolled the body over and discovered it was the Chief Officer and after checking and finding no pulse, he radioed the Master to inform him that the Chief Officer was probably dead. The 2nd Engineer pulled them back to the shelter of the deck tanks where he and the 3rd Officer tried to find a pulse. The two officers attempted resuscitation and heart massage for maybe ten to fifteen minutes. The Chief Engineer arrived at the scene checked the Chief Officer's pulse and told the others to stop and leave him in the recovery position and continue the rescue of the other injured crew. He informed the 3rd Officer that one of the injured crew had told him the Bosun was missing. Another harness and lifeline was brought forward which the Chief Engineer donned and he and the 3rd Officer then went forward via the port side access of the weather breakwater on to the forecastle to search for the Bosun. He was found lying and still conscious at the foot of the foremast behind the windlass control box. They carried the Bosun back to the deck tanks where he was put on a stretcher and taken to the accommodation. The 3rd Officer returned to the bridge at this point while the engineers recovered the body of the Chief Officer to the accommodation.
- 3.19 After completing his report to the Master the 3rd Officer took the watch. The Master then went below to ascertain the extent of the crew's injuries. Three of the seamen were placed in the Crew Day Room as the hospital was considered too confined. The 2nd Officer examined and administered first aid where necessary, with assistance from other crew members. The most seriously injured seaman was conscious but in severe shock, he had sustained leg fractures. Another had a broken arm and severe bruising about the body.

The third seaman appeared dazed and shocked. The Bosun, who was the last of the injured to be brought into the accommodation about 0930 hours lapsed into unconsciousness on his arrival in the Officers Mess. It was thought he had possibly suffered a head injury as blood was seen

coming from his left ear. Later, after first aid treatment, he was transferred to a spare cabin.

- 3.20 At approximately 0945 hours (1245 UTC) the Master established communications by satellite with the company's offices in the Isle of Man to inform them of the incident, the subsequent death of the Chief Officer and the injuries sustained to the four crewmen. A second call to the company updated the accident information and contact information was forwarded to the ship for contact with the United States Coastguard. Meanwhile the company were putting their emergency response team into action and making their own contact with the US Coastguard. A third call at 1028 hours (1328 UTC) from the ship established contact with the Royal Hospital Haslar, Gosport, Hampshire, England seeking radio medical advice. The hospital was advised that the ship was making for the nearest port, this being Hamilton, Bermuda.
- 3.21 The ship established contact with U.S. Coastguard RCC Miami at 1346 hours UTC and after a follow up call they were informed that RCC Norfolk would be taking over as the mission co-ordinating authority and providing radio medical advice. Contact was established between a U.S. Coastguard flight surgeon and the ship to administer appropriate drugs. Shortly afterwards RCC Norfolk contacted RCC Bermuda to report on the incident and update them with the situation. At 1613 hours UTC, RCC Norfolk informed the ship that they would be in charge of the proposed rescue action. At 1845UTC a conference call took place between RCC Bermuda, RCC Norfolk, U.S. Air Force Base Moody and the U.S. Coastguard flight surgeon in connection with the medical rescue evacuation, airport information and logistics en-route. The seriousness of the injuries and the distance from Bermuda would require the assistance of the two C - 130 refuelling transports and two H-60 helicopters with air to air refuelling capability. The aircraft would be utilised from Moody U.S. Air Force base in Georgia with Bermuda used as the jump off point for logistical purposes.
- 3.22 Meanwhile on the ship the 2nd Officer continued medical treatment as advised by the shore authorities. The Master organised three hourly watches of the crew to look after the four injured crew. A number of scheduled radio contacts were made during the night by RCC Norfolk, RCC Bermuda and the flight surgeon to establish the type of medical treatment requirements and to receive updates on the condition of the injured.
- 3.23 On March 3rd at about 1100 hours (1400 UTC) the condition of the seaman with the leg fracture injuries deteriorated rapidly. He was experiencing breathing difficulties so the crewman on watch in the Crew Day Room called the bridge to ask for assistance. The 2nd Officer arrived and administered oxygen to the seaman. Eventually he left leaving the watchman and other crew in attendance while returning to the bridge to report the situation to the Master. He returned to the Crew Day Room at 1115 hours when it was reported the patient's condition had deteriorated further. The Master advised RCC Bermuda on the latest condition of the seaman. The 2nd Officer collected more resuscitation equipment from the hospital. The Master arrived on the scene shortly after, however, the seaman lost consciousness about 1120 hours. A few minutes later he stopped breathing, no pulse or heart beat could be detected. Artificial respiration and heart massage commenced and this continued for some considerable time until the Master and others observed the visible signs of death. It was approximately 1230 hours (1530 UTC). Shortly afterwards RCC Bermuda were informed about the death of the seaman. The body was later removed to the Crew Recreation Room.
- 3.24 At 1257 hours (1557 UTC) the ship was advised that the rescue medevac operation had commenced with the departure from Bermuda of the helicopters, followed by the C - 130 aircraft. It was intended to seek a weather window in order to launch the para-rescue jumpers from the aircraft with a dinghy, the helicopters were to then follow up and execute a hoist of the

patients once they had been prepared by the para-jumpers. The ship was approximately 471 miles east north east of Bermuda at this time.

3.25 In communication with RCC Bermuda the ship advised that the weather was now south westerly at 35 knots. At 1427 hours (1727 UTC) the first C -130 aircraft located the "Johann Schulte" and advised course and speed changes as they assessed the weather to co-ordinate the drop. However, weather conditions were too severe and the para jump was abandoned. The ship was told to proceed south west and locate a more suitable weather window. They were advised of the estimated time of arrival of the helicopters. On arrival at the scene the initial contact with the helicopters was delayed by the stress of the weather. Finally at 1640 hours (1940 UTC) the hoisting operation commenced and four paramedics were lowered onto the ship. The injured crew were hoisted from the ship in two separate manoeuvres. After initial assessment by the paramedics the injured crew were evacuated by hoist in two phases to the waiting helicopters. The rescue aircraft departed the scene by 1820 hours (2120 UTC). The condition of the Bosun was of particular concern to the flight surgeon. A request was made to the Bermudan authorities to utilise another landing site closer to the hospital in Hamilton. The helicopters landed at the National Sports Stadium, Hamilton at 0130 hours UTC and the injured were transferred to King Edwards Memorial Hospital. The ship was advised by RCC Bermuda the crew had been landed to hospital. An estimated time of arrival of the ship at Hamilton on the 5th March at 1800 local time was passed to RCC Bermuda.

3.26 The "Johann Schulte" arrived at Murray Anchorage off Hamilton at 1747 hours local time on Sunday 5th March. The following day the ship manoeuvred from the anchorage to a berth at Kings Wharf Dockyard, where the bodies of the deceased crewmen were removed for post mortem examination by the Bermudan Government pathologist. A death inquiry and casualty investigation were subsequently conducted by a Mercantile Marine Officer and a Marine Surveyor from the Isle of Man Marine Administration.

3.27 The preliminary findings of the post mortem examination revealed that;

3.27.1 the Chief Officer died as a result of,

- 3.27.1.1 Bilateral Haemothorax
- 3.27.1.2 Transection of Thoracic Aorta and Vertebral Column
- 3.27.1.3 Blunt Trauma (Sea Wave)

3.27.2 The A. B. Seaman died as result of,

- 3.27.2.1 Multiple Injuries
- 3.27.2.2 Blunt Trauma (Sea Wave)

Part 4

Comment and Analysis

- 4.1 The investigation set out to establish why amongst an apparently experienced crew, a senior officer and five members of the deck crew went forward to check the anchor securing arrangements in heavy weather. The investigation also examined the background of events leading to this accident to determine whether there were any other factors which might have contributed to the tragic deaths of two members of the crew and the serious injury of two other crew.
- 4.2 The Captain was recently promoted to the rank and his first command was as Master of the "Johann Schulte". He had been in command for a period of three weeks prior to the incident. The hand over and familiarisation period from the previous Master was nine days. Prior to taking up this post he had sailed as Chief Officer on this ship and the sister ships, the "Wilhelm Schulte" and "Hermann Schulte" as well as other ships within the Schulte Group since August 1996. He has spent twenty three years at sea since qualifying from the Merchant Maritime University, Gdynia, Poland.
- 4.3 The Chief Officer had previously been employed as a Master on Polish tankers up until 1991, he qualified from the Polish Maritime School in Gydina Poland in 1970 with a diploma for Deck Officer. He transferred to ships managed by the Schulte Group in 1991 and has since been employed and gained experience on a variety of tankers and L.P.G. carriers in the positions of 3rd Officer, 2nd Officer and for the past four years as Chief Officer.
- 4.4 The Bosun had previous experience in this rank for six years and as A.B for two years all with ships managed by Dorchester Maritime under the Schulte Group. He had been employed at sea for at least 25 years prior to this incident. The three seamen all had previous experience on ships within the Schulte group.
- 4.5 The 2nd Officer is responsible for passage planning, he planned to route the ship from Sines in Portugal by a rhumb line course to a position south of the Azores. The ship was then routed to sail on a great circle course to the N. W. Providence Channel. A weather routing service was not utilised, the 2nd Officer planned to avoid the more northerly great circle route on departure from Sines as such passage would take the ship into the worst of the North Atlantic weather given the time of year. This passage plan was approved by the Master.
- 4.6 Prior to sailing a pre - departure checklist is used and item number 20 listed on the checklist requires "Anchors cleared and ready for use". The verification of this procedure would indicate that nothing was untoward with the anchoring or windlass equipment. The monthly maintenance reports forming part of the Safety Management System have been inspected and no evidence was found that the windlass, anchoring and securing arrangements were defective prior to the incident. Similarly there is no indication from the previous safety committee meeting minutes of any problems with the above machinery or equipment.

4.7 The ship sailed from Sines in the early hours of Saturday 26th February 2000. Full away on passage was recorded at 0200 hours twenty minutes after the departure of the pilot. The anchors were secured at 0215 hours. These facts are verified by entries in both the Deck Log Book and the Movement "Bell" Book. Confirmation that the anchors were secured would normally be received over the radio from the Chief Officer or his deputy present on the forecastle during standby. It has not been verified which officer was present on the forecastle that night. There is a documented procedure for securing the anchor written in the Operations Manual - Ship file, confirmation of this procedure is however, not defined.

4.8 The Bosun indicated that he and the Ordinary Seaman went forward on the evening of March 1st after four days at sea to check the securing arrangements on the anchors. He stated this was on the instructions of the Chief Officer. The weather up until this point on the passage had been reasonably fair. The Chief Officer may well have been fore warned about the impending weather forecast. The Bosun indicated in his statement that both the securing wires were slack and that they had to be tightened. It may have been prudent to have considered the use of extra lashings as a precaution against the weather forecast at this time.

The voluntary declaration statement given by the Bosun should not be wholly relied upon as evidence of the actual events. It is considered he was not sufficiently fit enough to undergo lengthy questioning due to the state of his health and the influence of medication at that time.

Operations Manual - Marine Operations – 14

14.1 Anchoring - Securing Anchor

9. Regular inspections of the anchor stowage and securing arrangements are to be carried out during sea passages.

10 Should the vessel encounter heavy weather, then inspections of the anchor securing arrangement are to be carried out as frequently as the Master considers safe. Additional lashings are to be made if in any doubt as to the security of the anchors.

4.9 Examination of the Master's written night orders for the period of Wednesday / Thursday night only provide a short reference of "Keep vessel to charted track, T. C. 255 degrees attend standing orders". No mention is made of the imminent weather even though weatherfacsimile charts and other information systems were readily available to provide warning of the onset of heavy weather. It is noted that the Chief Officer had not initialled the night orders for this night or the previous night contrary to written procedures.

Operations Manual - Marine Operations – 14

14.11 Night Orders

The Master is to maintain a Night Order Book in which:

- ♦ ***All orders and instructions specific to the vessel at that moment in time are to be recorded.***
- ♦ ***This book will be maintained on the bridge and shall be available for inspection by visiting Operations Department staff and other interested parties.***
- ♦ ***All orders made in the Night Order Book are to be read and initialled by each Officer of the Watch.***

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- ♦ *The night orders are to include the course to be steered with errors allowed and other such instructions, as the Master considers necessary.*
 - ♦ *The Master's standing orders should be placed at the front of the Night Order Book or other such prominent place.*

4.10 The 3rd Officer was relieved by the 2nd Officer at 0040 hours to coincide with the clocks retarding that night by one hour. A normal watch hand over took place and the 3rd Officer recorded the weather in the Deck Log Book at midnight as being, " Wind SW, force 5, vessel pitching moderately, showers, on deck, spray ". No recorded reference was made of the direction and height of the swell. The course was 255 degrees and the engine speed set at full on 127 rpm. The 2nd Officer has stated that when he took over the watch the winds were, strong south westerly force 8 to 9, we were steering 255 degrees and the wind was on the port bow, the vessel was pitching heavily taking spray forward and the vessel was at full speed ". Similarly he quotes, "the vessel was pitching heavily and taking water forward on deck". Given a time difference of some 40 to 50 minutes between midnight and completion of the change over of the watch, it must be concluded the onset of the weather must have been very rapid. This could have indicated a passing weather front. Weather information received since the incident has confirmed a frontal passage moving across the known track of the vessel with the winds shifting from the south to south west. The weather conditions were obviously making conditions on the ship uncomfortable with the log book entries describing the increased pitching motion.

4.11 The fact that the ship was at full speed can be verified by the Engine Log print out. The periodic log print-out for the subsequent period, 02 Mar 00 at 00.00:00 shows telegraph position, "Full Ahead". The Officer of the Watch is the Master's representative while keeping a watch and as such has the authority to carry out whatever he considers necessary for the safe navigation of the ship. The main engines are available for manoeuvring to the watch keeping officer. Therefore the Officer of the Watch could have adjusted the ship's speed if needed to suit the weather conditions, or alter course off the weather to ease the motion of the ship, then called the Master, or alternatively he could have considered calling the Master anyway to inform him of the rapid deterioration in the weather.

Operations Manual - Marine Operations – 14

14.12 Safe Speed

- ♦ *The vessel is at all times to be navigated at a safe speed consistent with prevailing weather conditions and geographical location. Speed should be adjusted in bad weather to prevent damage to the vessel from slamming, pounding or wave action.*
- ♦ *Navigating Officers should be aware of speed restrictions and barred revolution ranges for the main engine and should avoid operation in these areas*

14.17 Manoeuvring on Bridge Control

Bridge controls must only be operated in accordance with the manufacturer's instructions

- ♦ *All Deck Officers should note that whilst on passage the main engines are available for immediate manoeuvring if required to avoid a close quarters situation, collision or grounding*

4.12 The ship's clocks were retarded by one hour at 0200 hours. Approximately 45 minutes later at 0145 hours the 2nd Officer has described receiving a telephone call from the Chief Engineer.

He had been woken up by the stress of the weather and was concerned enough about the performance of the main engine to visit the Engine Room. His inspection confirmed the engine was taking too much load under the present conditions. The Chief Engineer requested the 2nd Officer to reduce the engine speed and he remained below to complete his checks. The 2nd Officer described continuing his watch without further incident and handed over to the Chief Officer at 0400 hours. He states the Chief Officer appeared properly rested and in all respects ready to take over the watch. A discussion took place between the two officers about the current weather conditions and the likely sequence of weather to effect the ship. The 2nd Officer reported that the ship had been on reduced revolutions since 0145 hours due to the main engine overloading. The entry for the weather in the Deck Log Book at 0400 hours was recorded as “wind south south-westerly, force 8 / 9, sea state 7, vessel pitching heavily, shipping seas forward and spraying overall, cloudy with thundery showers”. Again as with the previous watch no entry was made for the direction and height of the swell.

Operations Manual - Marine Operations – 14

14.19 Calling the Master - In the following circumstances the Officer of the Watch must inform the Master immediately.

14.19.7 If the weather deteriorates or other unusual conditions, such as ice accumulation is encountered

14.19.10 If a reduction in engine speed is made for any reason

Below is an extract from the Master's own supplementary standing orders issued on taking command of the vessel.

Master's standing orders for watchkeepers (applicable from 12/02/2000)

2. Watch Arrangements

(b) In deciding the composition of the watch the following factors shall be amongst those taken into account.

(2) The prevailing and expected weather conditions, visibility and whether there is daylight or darkness.

9. Calling the Master - The officer of the watch shall call the Master at any time:-

6. If difficulty is encountered in maintaining the required course and / or speed.

8. Deterioration of the prevailing weather conditions causing stress to the vessel, potentially dangerous conditions on board or ice accumulation.

19. When a reduction is made to main engine speed, either by the officer of the watch or unexpectedly.

27. Before sending any person on the open deck or allowing any person on the open deck during heavy weather.

4.13 The Chief Engineer has stated that he was woken up by the heavy weather, went below to the Engine Room and found that the main engine was taking too much load. He telephoned the bridge and requested the 2nd Officer to reduce speed accordingly. The Engine Room Log entry for 0145 hours has confirmed the reduction in speed, however, nothing has been recorded on the Engine Log print out at this time. On the periodic log print out for 0400 hours the dead band check has a recording of 124 rpm. The small reduction in revolutions probably had little impact on the overall ship's speed in relation to the weather conditions experienced at the time, although it may have achieved the Chief Engineer's purpose of reducing the load.

Operations Manual - Machinery Operations – 27

27.15 Communication between Bridge and Engine Room Watch Keepers

The watch keeping Engineer Officer shall inform the bridge of any change in the running condition of machinery that would affect the operation of the vessel.

Operations Manual - Marine Operations – 14

14.20 Deck Log Book

Entries in the Deck Log Book are to be completed where applicable and are to include the following information. Relevant comments and times should also be made.

14.20.5 State of sea and swell.

14.20.12 Accidents and incidents occurring to the vessel such..... as any unusual bumps or movement felt on the vessel.

14.20.34 Any notable occurrence.

14.20.36 Times of entry and departure of personnel entering the Unmanned Engine Room

4.14 The Master became conscious of the increasing ship motions, he “thought the ship was pitching too heavily” and came up to the bridge at about 0420 hours. After a short discussion with the Chief Officer a second reduction in speed was ordered. This required the Master to telephone the 3rd Engineer who in turn telephoned the Chief Engineer presumably for confirmation of the reduction limits. The 3rd Engineer went below to adjust the engine speed locally and this is verified in the Engine Log print out, the event log entry 02 Mar 00, 04.26:09 records this reduction. The Master was sufficiently concerned that he attended the bridge and ordered a speed reduction. On the other hand the Chief Officer had not considered such a move. Clearly there was a difference in perception. The Chief Officer appears to have felt conditions were less severe than did the Master. Given the recorded weather log entry at 0400 hours, “vessel pitching heavily, shipping seas forward and spraying overall”, and the fact that the Master, an experienced man, felt it necessary to come up to the bridge it is concluded that the Chief Officer may have had a tendency to underestimate conditions.

Another Engine Room log entry at 05.14:14 records a further reduction in engine speed. Who ordered or carried out this reduction has not been determined.

- 4.15 The Master who now remained on the bridge for the next three hours had many conversations with the Chief Officer including a discussion about checking the condition of the forward areas of the vessel. No plan of action was agreed or risk assessment determined. They did not even discuss a specific time when a check forward would be favourable. The Chief Officer gave no indication to the Master that he would be going forward or planned to go forward. Neither was this matter discussed further during the Master's visit to the bridge between 0745 and 0800 hours. Whether or not the Chief Officer had it in his mind to proceed forward anyway reasoning that he did not wish to worry a newly appointed Master unnecessarily will never be determined. Given that both of these officers had many years of experience between them it is difficult to comprehend that no plan of action was prepared
- 4.16 The Master also states he did not overhear the Chief Officer mention any intention of going forward to the 3rd Officer when the watch was handed over at 0800 hours. The 3rd Officer confirms that he was not informed of any proposed forward deck activity or problems on the forecastle with the anchors. The Chief Officer's entry of the weather in the Deck Log Book describes, "wind south west, force 8 sea state 7, vessel pitching heavily, shipping seas on deck. Again no entry was made to indicate the direction and height of the swell. With the description of such weather conditions it would be quite clearly evident for the Master, Chief Officer and 3rd Officer to visually see in the daylight hours that any attempt to go forward would have been potentially hazardous.
- 4.17 The Bosun normally went to the bridge at about 0645 hours each morning to discuss the day's work schedule. It has not been determined or verified from any other statements whether the Bosun appeared at that time on the morning of 2nd March. However, he may have visited the Chief Officer when the Master was away for his breakfast. The Bosun may have been given work instructions about working forward from the Chief Officer at some time prior to 0800 hours to be in a position to pass the order to the deck crew in the Changing Room as verified by one of the seamen. However, these instructions may have only been issued by the Chief Officer when he left the bridge at the end of his watch.
- 4.18 It has not been determined when the Chief Officer released the watch rating from his lookout duties on the 0400 / 0800 watch, or what had become the normal routine practice. It is known the hand over to the 0800 / 1200 watch rating took place in the Crew Changing Room about 0800 hours. The normal means of communicating with the Officer of the Watch was the use of a V.H.F. walkie-talkie.
- 4.19 Not only the deck crew but also the Gas Engineer went out on deck that morning. The Gas Engineer went to the Compressor house before 0800 hours. None of these excursions forward appear to have been notified to the Officer of the watch. The 0400 / 0800 hours lookout was also forward alone during his watch checking out an alarm in the Deck Store. Both the compressor House and the Deck Store are situated aft on the Main Deck within easy reach of the accommodation. The Gas Engineer was of the view that going further forward could be dangerous, he told the Chief Officer, "not to go because the weather is bad on deck". It is presumed that the Chief Officer authorised the lookouts excursion on deck but the Gas Engineer's two trips to the compressor House and the Chief Officer's foray to the forecastle were undertaken without informing the Officer of the Watch.

All the evidence suggests that the conditions were potentially hazardous on deck. Good seamanship requires and has always required, that the presence of crew on exposed decks be notified to the bridge watchkeeping officer, particularly in bad weather. The Company's procedures require this. It is clear that observance of these procedures was not routine on "Johann Schulte".

Operations Manual - Marine Operations – 14

Look-out

The Officer of the Watch shall ensure that he maintains a continuous and alert look-out :

A rating in addition to the Officer of the Watch is to be detailed to keep a look-out on the bridge.

Certain circumstances may permit the Officer of the Watch to be sole look-out during daylight hours, however, this practice shall only be followed after the situation has been carefully assessed and the look-out is within calling distance of the bridge.

From the Master's standing orders - issued 12/02/2000

4. Navigation

(b) Prior to accepting responsibility for the watch the relieving officer shall be personally satisfied as to the following:-

- ◆ motion of the vessel with respect to rolling, pitching, leeway & set experienced***
- ◆ the makeup of the Bridge watch and if the watch keeping rating is to be assigned other duties than those of lookout, his location and means of communication. The relieving officer must be satisfied that the members of his watch are capable of carrying out their duties. Watch ratings shall always report to the bridge at changeover of the watch.***
- ◆ Any instructions given by the Master or Chief officer concerning deck operations or equipment and / or the monitoring and / or custody of the cargo.***
- ◆ Status of the Engine Room manning and watch keeping, the identity and location of engine room duty personnel, use of the “dead man” alarm.***
- ◆ Any work being carried out on board which may require special consideration or monitoring by the Bridge watch.***

4.20 After leaving the bridge the Chief Officer had his breakfast and then he presumably changed his clothing prior to going forward. The Gas Engineer has described meeting the Chief Officer at about 0820 hours as he passed through the Cargo Control Room on his way out onto the deck. They had a brief conversation about weather conditions, the Gas Engineer even suggested that the Chief Officer should not be going on deck because the weather was too bad. However, the Chief Officer must have thought otherwise as he left and proceeded forward anyway. The Chief Officer may have considered that safety was afforded by the high freeboard of the vessel and enough protection from the adverse sea conditions warranted an inspection of the forward areas. Earlier events also suggest that the Chief Officer perceived conditions to be better than everyone else did.

4.21 The four crew, comprising the Chief Officer, the Bosun, the 0800/1200 rating and the day worker (an Ordinary Seaman) went forward to check the anchors and securing arrangements. There is no evidence that any of the crew members were wearing safety harnesses. The Code of Safe Working Practices for Merchant Seaman advises seamen, if a vessel is shipping frequent seas, persons on deck should wear a harness and, where practicable, should be secured by lifeline as protection from falls and from being washed overboard or against the ship's structure

or fittings. The crew is estimated to have moved onto the forecastle at about 0825 hours. About ten minutes later they were joined on the forecastle by two other seamen. The port anchor was described as being “ a bit loose ” so it was hove tight, this in turn slackened the securing wire around the cable. It was necessary to adjust the securing wire to hold the anchor cable properly. Photographs taken at the port of refuge (See Appendix I, Diagram No.2 & 3) show the type of cable securing arrangement, the wire, bottle screw attachment and shackle securing. Examination of the wire on the port cable securing arrangement showed that part of the wire had been “ pinched ” close to one end and the eye had somehow become distorted. It proved impossible under a test to pass a shackle through this eye, which leaves three possibilities;

- ♦ If the damage had been recent a shackle could not have been removed from the eye therefore it can be reasoned that without the presence of the shackle the damage could have been older and that might possibly suggest the anchor cable was not properly secured on departure from Sines.
- ♦ The “pinched” section of wire suffered damage when it was passed through another link in the cable while the crew were attempting to re-secure the cable.
- ♦ The distortion of the eye was caused during the re-securing of the anchor cable after the shackle had been removed from the securing wire eye to facilitate the ease of passing the wire between the anchor cable links or it was damaged by the force of water breaking onto the forecastle during the attempt to re-secure the anchor cable.

4.22 It has proven impossible to confirm which possibility is the correct one. However, on the balance of probabilities the last one is considered the most likely. Furthermore it is considered that the size of the securing wire is insufficient for the needs of securing this size of anchor cable. Neither should there be a need for extra lashings to be used, the standard securing method should be good for all situations.

4.23 The 0800 / 1200 seaman working on the forecastle describes that as the ship began pitching noticeably he was splashed in the face by water which came up through the hawse pipe. When this happened he turned away to clear his eyes and saw the first of the waves approaching. Whether he moved from his working position around to the aft side of the windlass to clear his eyes, is not clear, however he somehow had sufficient time to move to a position of relative safety behind the windlass to protect himself. The Chief Officer and the other crew present were all facing aft at that time in a position forward of the windlass, and it would appear no warning was passed to them of the approaching wave. (See Appendix II, Diagram 1).

4.24 The impact of the waves threw the Chief Officer and four of the crew to the positions as indicated (See Appendix II, Diagram 1). The 0800 / 1220 seaman who survived the impact uninjured was unable to inform the Officer of the Watch on the bridge of the incident using his walkie-talkie radio because he had put the radio down in safe place to avoid damage by the wet spray coming over the bow.

The radio was eventually found (when the vessel arrived at the anchorage in Hamilton) on the platform inside the access to the Bow Thruster space situated on the starboard side of the forecastle. When the water had subsided the seaman made his way off the forecastle and aft to raise the alarm. As he made his way aft down the starboard side he did notice two of his colleagues who lay injured in and around the No.1 deck tanks.

4.25 The damage sustained to the ship was minimal and pictorial evidence of this can be found on the photographs taken at the port of refuge in Bermuda. (See Appendix I).

4.26 The 3rd Officer felt the impact of the waves at about 0840 hours from inside the Chart Room and rushed out to the wheelhouse front to view the scene. The motion and the wave impact were sufficiently unusual to make him move to the wheelhouse windows. He was completely unaware that any crew were working forward on deck. He spotted something or someone on the port side of the fore deck. He attempted to contact his 0800 / 1200 watchman on the V.H.F. radio. From the position indicated by the 3rd Officer very little can be observed of the fore deck from the wheelhouse (See Appendix I, Diagram 1). The 3rd Officer then telephoned the 2nd Engineer in the Engine Room and asked for his assistance on the fore deck prior to making contact with the Master and informing him of the problem.

4.27 When the Master arrived on the bridge the 3rd Officer repeated his synopsis of the situation as he knew it. The Master tried to identify using binoculars what or who was lying on the port side of the fore deck. "There was a possibility it was just an oilskin blowing in the wind". The 3rd Officer was sent on deck to report on the situation. The Master at this stage was still unaware of any other crew on the main deck. He did not realise the full extent of the problem even after the telephone call from the Gas Engineer who informed him about the injured crew on deck. Confirmation of this report was also received from the 3rd Officer by radio when he reached the deck and found the 2nd Engineer and his crew attending the injured. The Master has admitted he made no attempt to sound any alarm or use the public address. It is doubtful that the use of such an alarm would have speeded up the response of the crew to the impending emergency as the majority were already out on the fore deck. The sounding of the alarm may well have caused confusion with those members of the crew on deck, as they may well have headed instead to their respective muster stations.

4.28 The 2nd Officer who was asleep at the time of the incident was telephoned and requested by the Master to attend the ship's hospital to receive three injured crew. The Master thought that about 15 minutes had elapsed since his arrival on the bridge. The ship was still maintaining her original course of 255 degrees and engine speed at 115 rpm. He now altered course to port, to about 200 degrees. He was very worried for the person lying against the railings, and equally concerned for the safety of the 3rd Officer and others who were trying to effect a rescue of that person. The Master had still not established how many crew were involved in the incident, however, he was beginning to realise that most of the deck crew were involved. Furthermore he had not appreciated that the crew had been on the focsle because the injured were at the deck tank and he thought the injuries were somehow related to work being carried out in that vicinity. His lack of data on the extent of the unfolding emergency accounts for the fact that the ship's course and speed were not altered sooner. An alteration of course off the weather might have induced a rolling effect on the ship and therefore increased the dangerous predicament for the person lying close to the ship's side rails and that of the rescuer, the Master would be naturally worried for their safety. A reduction in the ship's speed might have proved more prudent initially to reduce the amount of water and spray breaking over the deck. It is concluded that on the information available the Master acted correctly.

4.29 It was approximately half an hour after the alarm was raised that the 3rd Officer was able to reach and identify the person on the port side of the main deck as the Chief Officer. This was the period when the Master finally thought it safe to reduce speed. The Chief Engineer ordered the change over to manoeuvring revolutions on the Master's instructions. The event log on the Engine Log print out, confirms this reduction at 09.14:29.

4.30 The Bosun was reported to be missing by those attending the injured at the deck tanks. The Chief Engineer and 3rd Officer with the use of harnesses and lifelines effected the rescue of the Bosun by entering the focsle area via the port side access. He was found lying behind the winch control stand between the port and starboard windlasses, and was described as being conscious, with a swollen jaw and bleeding from the left ear. The Master confirms that about 0920 hours during the rescue of the Bosun on the forecastle by the 3rd Officer and Chief Engineer the access door to the Bow Thruster space was found open. Later when all of the crew had been rescued the Chief Engineer and 2nd Engineer returned to the forecastle and closed up this open access door. As confirmed earlier the missing watchman's radio was not spotted on that occasion and was only recovered when the ship arrived in Bermuda.

4.31 Given the circumstances, the incapacity of so many key crew , the weather conditions and the lack of data on what was happening it is concluded the rescue effort was very well conducted and effective. With all of the injured crew and deceased Chief Officer inside the accommodation the Master was relieved on the bridge by the 3rd Officer. He went below to attended the injured and appraise himself to the extent of their injuries. At approximately 0945 hours (1245 UTC) the Master informed the Company about the incident. The Master and remaining crew now had the difficulty of dealing with the injuries sustained to the deck crew and their own reactions of shock at the outcome of the incident.

4.32 The working schedules and the hours of rest of each of the crew directly involved in the incident have been examined. No unusual hours were worked prior to the incident, the ship's crew were otherwise keeping to normal working patterns and a conventional deep sea routine.

4.33 On the day of the incident the course recorder trace shows a marked change in the course /rudder activity maintained from approximately 0100 hours onwards, becoming more distinct from 0200 hours to 0900 hours when the alteration of course was taken during the incident. This would confirm a strengthening in the sea conditions as the weather deteriorated, the recorder vibrations indicating the amount of motion the ship had to endure while maintaining the course and speed in that period. This confirms the points raised in paragraph 4.10.

4.34 A large section of the narrative in part 3 has described the events onboard the ship up to the point where all of the injured were inside the accommodation. When the company were informed by the Master the extent of the incident they responded quickly to the events by putting their emergency response team and organised plan into action. Their own initial contact with United States Coastguard authorities allowed for a quick response to the incident. Plans were speedily drawn up for the co-ordination of a medical rescue evacuation. Contact for radio medical advice was initially sought through the United Kingdom prior to the U.S. Coastguard and RCC Norfolk assuming control with a Coastguard flight surgeon taking charge of the medical responsibilities. The flight surgeon's initial communications with the Master assessed the nature of the injuries to the crew. It was the extent of these injuries which pre-determined the course of action by the rescue authorities.

4.35 The medical rescue evacuation plan devised by the U.S. authorities was extremely thorough and required a comprehensive logistical operation on the part of the U. S. Air Force. The most difficult aspect of the undertaking being the operational distances to reach the "Johann Schulte". The eventual plan involved two C -130 aircraft and two HH - 60 helicopters which were required to fly from their air base in Georgia to Bermuda. After a refuelling and servicing stop the intention was to rendezvous with the ship some 500 nautical miles east north-east of Bermuda. Parajumpers would be air dropped from the aircraft into the sea with their equipment to rendezvous with the ship. The helicopters would follow up to arrive sometime later and

evacuate the injured.

4.36 All of the U.S. Air Force aircraft took between three and half to six hours to complete the first leg of the operation from Georgia to Bermuda. The aircrew then had to stand down as their operational hours parameters had been exceeded. This necessitated a delay to the second phase of the rescue operation. Just prior to the departure of the rescue aircraft from Bermuda the ship reported that the condition of the seaman with the leg fractures had deteriorated, and he subsequently died a short while later.

4.37 In no small way must the contribution and the scale of effort by the rescue co-ordination authorities be overlooked. Although RCC Norfolk assumed overall control of the operation a large proportion of the work was undertaken by the Bermudan authorities. In particular RCC Bermuda whose case narrative of the SAR operation has proved an invaluable source of information as to how the medevac operation was successfully executed by the U.S. Air Force aircraft.

4.38 The Master stated that he considered that the ship had insufficient medical stores on board to deal with a casualty of this nature. However, he did confirm that the ship was carrying the correct amount of regulatory medical stores. Besides statutory regulations which regulate the mandatory minimum amounts and types of medical stores required to be carried on a ship, it would be for a ship owner to supply extra medical stores over and above the statutory requirements. In light of this recent incident it may be for the Marine Administration to review the requirements of medical stores on its registered ships.

4.39 A week after this incident another Isle of Man registered ship was involved in an incident in heavy weather. Crew members were sent forward to investigate the activation of a bilge alarm in the forecastle space. The Master in this case assessed the risks involved prior to sending a working party forward and manoeuvred the vessel to place the wind and seas astern. Furthermore he reduced the speed of vessel to reduce the effects of pitching and rolling in the heavy seas. During the investigation forward the anchor securing chains were found to be missing and it was noticed the forward liferaft had broken free from its mounting. While the liferaft was being retrieved a wave broke over the deck of the vessel. One of the crew from the work party was hit by the wave and thrown against the ship side rails receiving an injury.

4.40 These incidents confirm that no matter how well managed and prepared a particular crew are for an operation of this type, the unexpected could well prove to have disastrous consequences. There have also been several other recorded incidents in heavy weather where anchors and cables have been damaged or lost. Some of the investigations into these incidents have revealed the use of inadequate lashings. It may be the case that the wire lashings used on the "Johann Schulte" are inadequate for their purpose when the vessel encounters periods of heavy weather and subsequent water on deck..

4.41 It was reported that the vessel was struck by two waves at the time of the incident. An investigation into the probability of synchronised pitching has been conducted based upon the available information to date. The initial findings of these calculations have shown there is no indication of any significant influence of synchronous wave pitching from a preliminary analysis. Although given the conditions were sufficient to result in the immersion of the forecastle deck area, such motion could have significantly increased the magnitude of immersion. The preliminary calculations indicate that the deck would be immersed by 1 metre about once every 2 hours, with less serious immersion about 3 times an hour. Deeper immersion would obviously be less frequent but it is feasible that the deck could be submerged by more

than 2 metres during a 10 hour period. Though this in itself is not particularly frequent, it does support the likelihood of the deck becoming submerged. What is clear is that at least two green seas, of some magnitude, washed over the forecastle while the crew were there. There is not sufficient data to analyse exactly why and no evidence to suggest that it happened before or after the accident. It is concluded that the event was a random one, most probably created by the changing complex sea conditions, perhaps arising from the wind shift associated with the passing front.

4.42 Although faced with the loss of two crew members the Master, officers and crew should be praised for their efforts to rescue the injured, provide first aid and medical care up until the medical evacuation.

Part 5

Conclusions

5.1 A number of factors have been highlighted by the investigation, but not all of them have a direct bearing on the actual incident. However, on the basis of the analysis in Part 4 of this report the following conclusions are reached;

(i) It is concluded from the evidence available that the Chief Officer acted on his own initiative to organise and check the anchor securing arrangements placing himself in a high risk situation. His subsequent actions compromised the safety of the deck department crew.

(ii) The actions of the Chief Officer ignored the basic and fundamental rules of good practical seamanship.

(iii) The Chief Officer failed to appreciate the consequences of not preparing a “plan of action” to properly assess the risks involved of crew going forward in heavy weather conditions. Had a proper and concise “plan of action” been followed then this incident may have been avoided.

(iv) There were inadequate written procedures on the guidelines for safe working operations in heavy weather.

(v) It is evident that no written procedures were in place to advise the Officer of the Watch when crew members were working on the fore deck in adverse weather conditions, however, provision is made in the Master’s standing orders for the Officer of Watch to be personally satisfied as to any work being carried out which may require special consideration or monitoring by the Bridge watch.

(vi) Neither the Officer of the Watch nor the watch rating (allocated to lookout duties) established a proper work routine or line of communication to each other, contrary to the Master’s standing orders issued on the 12/02/2000

(vii) The investigation revealed that a number of standing orders and written procedures within the Master’s Standing Orders and Safety Management System, in particular procedures from the Ship - Operations Manual have not been followed by officers when performing their duties. In particular the following were not fully followed;

- the procedures to carefully assess the requirement to have the use of a lookout in daylight hours.
- watchkeeping ratings shall always report to the bridge at changeover of the watch

- if the watchkeeping rating is to be assigned other duties than those of the lookout, his location and means of communication should be confirmed.
- the 2nd Officer and the Chief Officer both failed to appreciate the building weather conditions, necessitating firstly the Chief Engineer at approximately 0145 hours and then secondly the Master at approximately 0420 hours taking direct action to reduce speed.
- the procedures in place for watchkeeping officers to understand the requirements of standing orders and when to call the Master, including before sending any person on the open deck or allowing any person on the open deck during heavy weather
- the recording of the direction and height of the swell in the Deck Log Book.

(viii) There is no historical evidence from the ship's maintenance records to suggest that the crew had previously been aware of any problems with the anchor cable securing arrangements.

(ix) The available evidence has pointed to the Chief Officer acting on his own initiative. There is no evidence that the Master and Chief Officer did not have a good working relationship or that their discussions in this insistence conflicted with each other. It is evident that the cause was a lack of communication by the Chief Officer to notify either the Master or the Officer of the Watch of his intention to proceed forward and undertake an investigation of the anchor securing arrangements without assessing the risks. Therefore the Master could not be responsible for the actions of the Chief Officer.

Part 6

Recommendations

There have been many other accidents recorded aboard ships when personnel were engaged in working on deck in heavy weather.

It is recommended that while identifying the facts which have contributed towards this incident, the Marine Administration should notify the shipping industry by promulgation of a Merchant Shipping Notice, as a reminder of the risks.

The following recommendations are made based on this incident and the evidence at this time. These recommendations are directed to this Company and the operation of their ships, but they should also apply to all ships.

(i) The Company should assess the risks and introduce written procedures controlling work safely anywhere on deck outside the accommodation block during periods of heavy weather.

(ii) The Officer of the Watch should be notified if work is to be carried out on deck in any type of weather conditions and the bridge watch team should be adequately manned to allow for any special consideration or monitoring by them.

(iii) Additional procedures should be written into the Dorchester "Operations Manual - Ship", in so much that a "plan of action" or risk assessment strategy shall be undertaken prior to any investigations of ship's equipment being carried out on deck in periods of heavy weather.

(iv) Written procedures should be placed in the "Emergency Response Plan" file to provide the crew with contingency plans and drills describing how they will deal with an emergency situation in heavy weather as per the guidelines recommended in applying the International Safety Management Code.

(v) Officers should be instructed to take care in recording the entries in the Deck Log Book, particularly in adverse weather conditions.

(vi) It has been identified in this investigation that certain procedures were not fully followed in executing the safe navigation of the vessel. It is recommended that the Company review these procedures and address the points raised in paragraph (vii) of Part 5 of this investigation. A report of their findings should be made available to the Marine Administration.

(vii) A copy of this report should be circulated to each ship in the Company's fleet registered with this Administration and read by all of the crew members.

- (viii) It is recommended that the anchor cable securing arrangement be assessed and;
 - (a) a stronger securing wire be used or,
 - (b) an alternative securing arrangement be introduced.
- (ix) Failure to follow a written procedure which is safety related should be made a

Part 7

Submissions

A draft of this casualty investigation report was sent to the following ;

- The technical managers Dorchester Maritime Limited.
- The Master of the “Johann Schulte”.
- The Principal Marine Surveyor, Registry of Shipping, Government of Bermuda.

A submission was received from the technical managers Dorchester Maritime Limited and the report was amended where necessary to reflect their various comments. The Master made no submission other than to concur with the findings of the report.

Part 8 - Appendices

Appendix 1



Diagram 1

The above picture depicts the view from a wheelhouse front window, starboard side of centre line, and shows the fore deck arrangement of the “Johann Schulte”. It confirms the impracticality of being able to visually see anyone or any group of people working forward, especially anyone on the forecastle. The forecastle deck area is completely hidden by the ship’s structures and the weather breakwater.

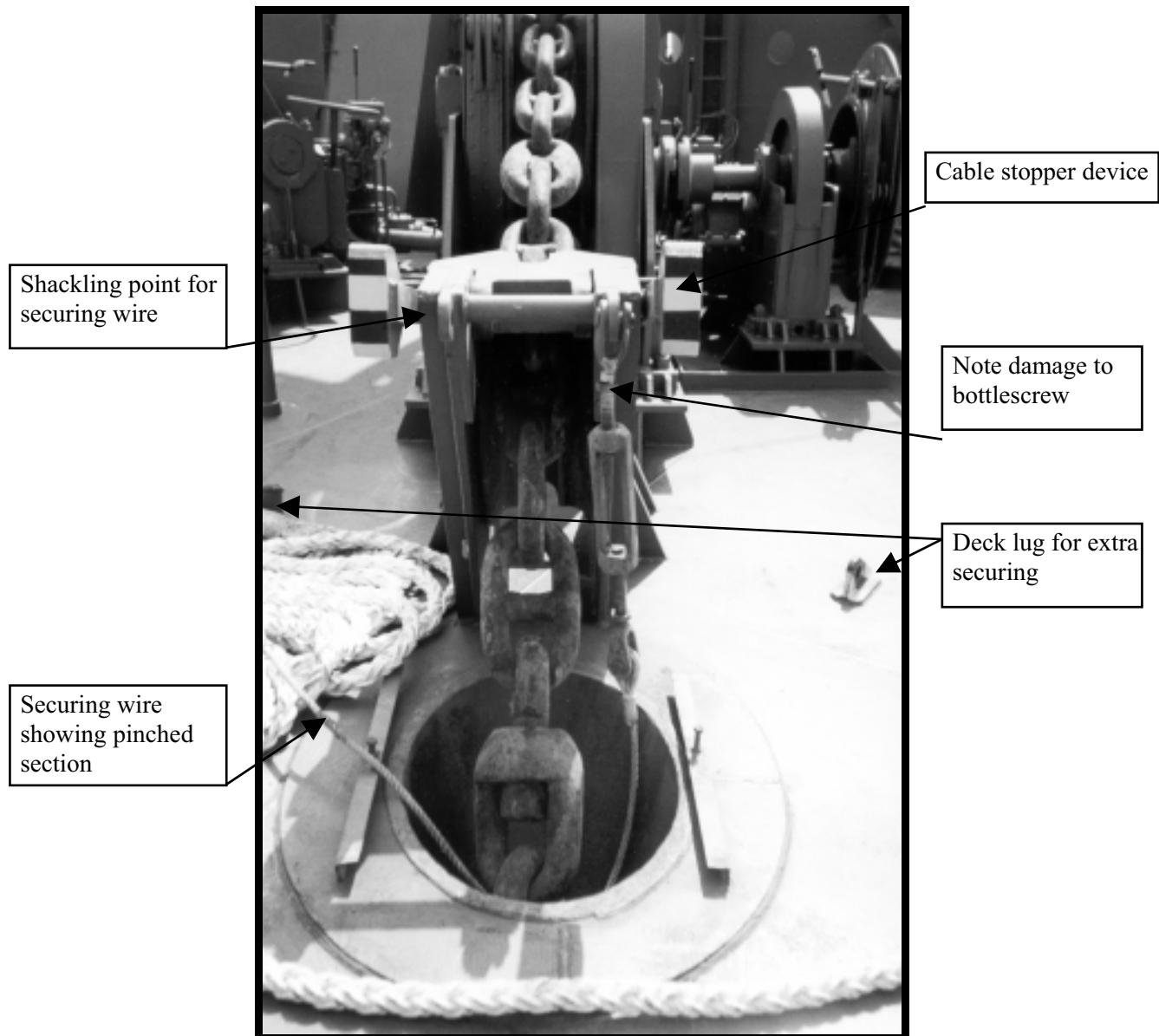


Diagram 2

The above picture shows the port side anchor securing arrangement on the “Johann Schulte”.



Diagram 3

The port side anchor cable securing arrangement with an officer depicting how the securing wire is passed through the anchor cable and secured by shackle to the eye bolt on the inside of the counter weights of the cable stopper.

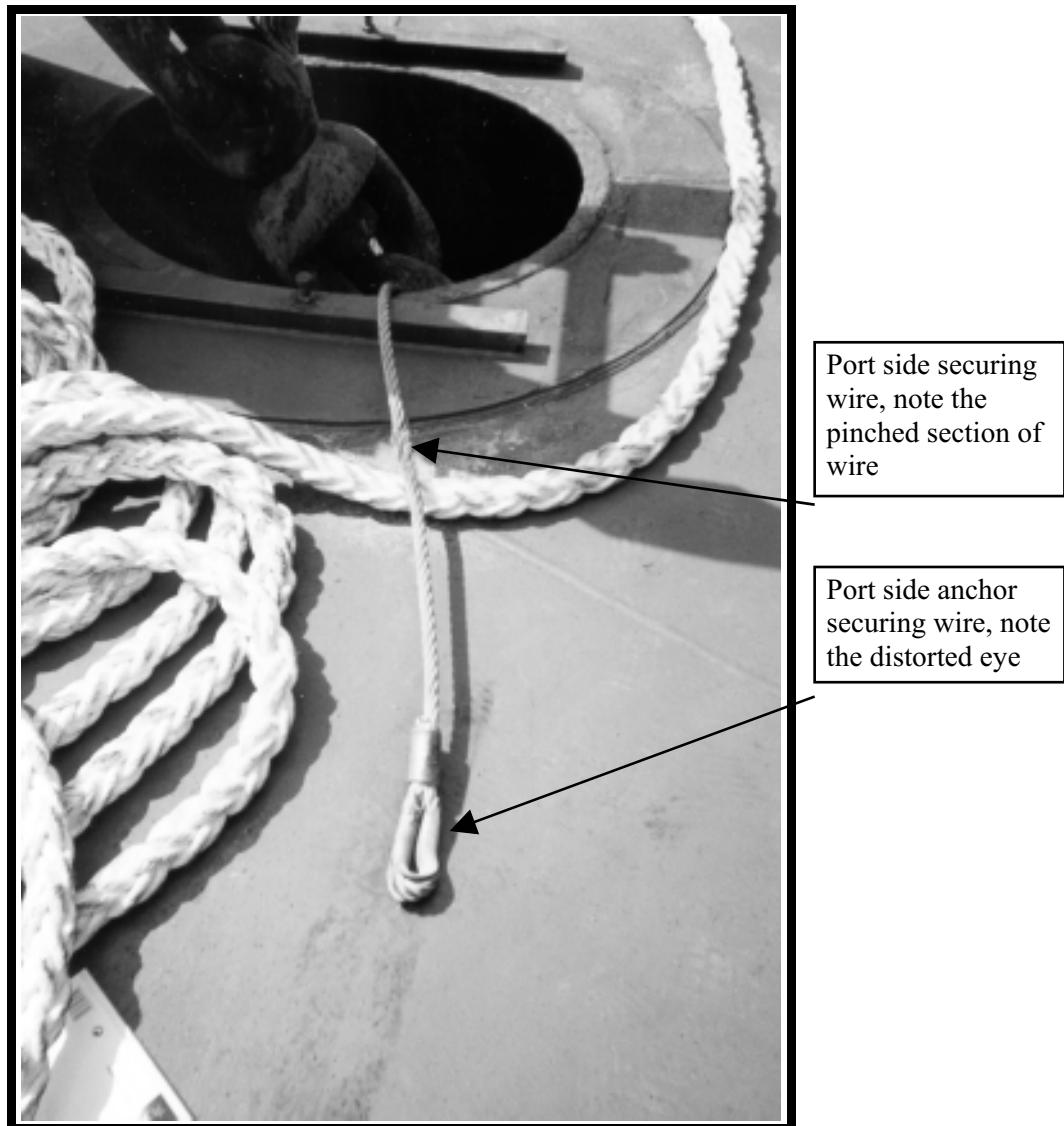


Diagram 4

When the preliminary investigation officers examined the scene on the forecastle deck it was discovered that the securing wire eye had been distorted. The probable causes as to how this distortion happened have been examined in the analysis described in Part 4, paragraph 4.21



Diagram 5

The above picture above depicts the damage sustained to the windlass control stand which is just forward of the position where the Bosun was found by the 3rd Officer and Chief Engineer.



Diagram 6

The picture shows the forward underside area of No.1 (S) Deck Tank and depicts the position where the starboard hawse pipe cover was found.



Diagram 7

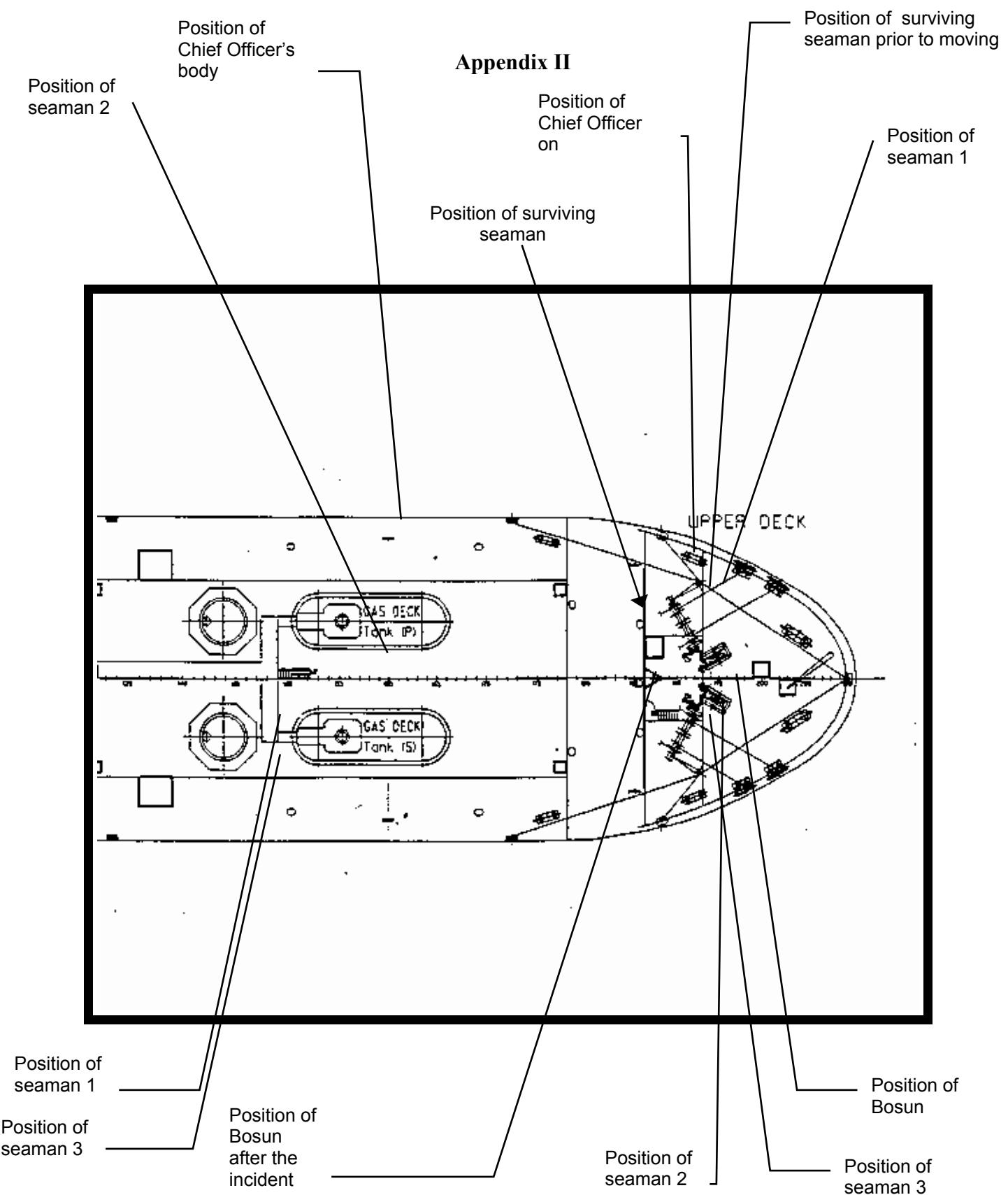
The picture shows the position where the body of the Chief Officer was found in relation to the forecastle. The view looking forward shows the height of the weather breakwater and the port side access through which the 3rd Officer and Chief Engineer effected the rescue of the Bosun. Note the damage sustained to the safety ring on the foremast.



Diagram 8

The well area between the No.1 Deck Tanks close to where two of the seamen were found after the waves struck the ship.

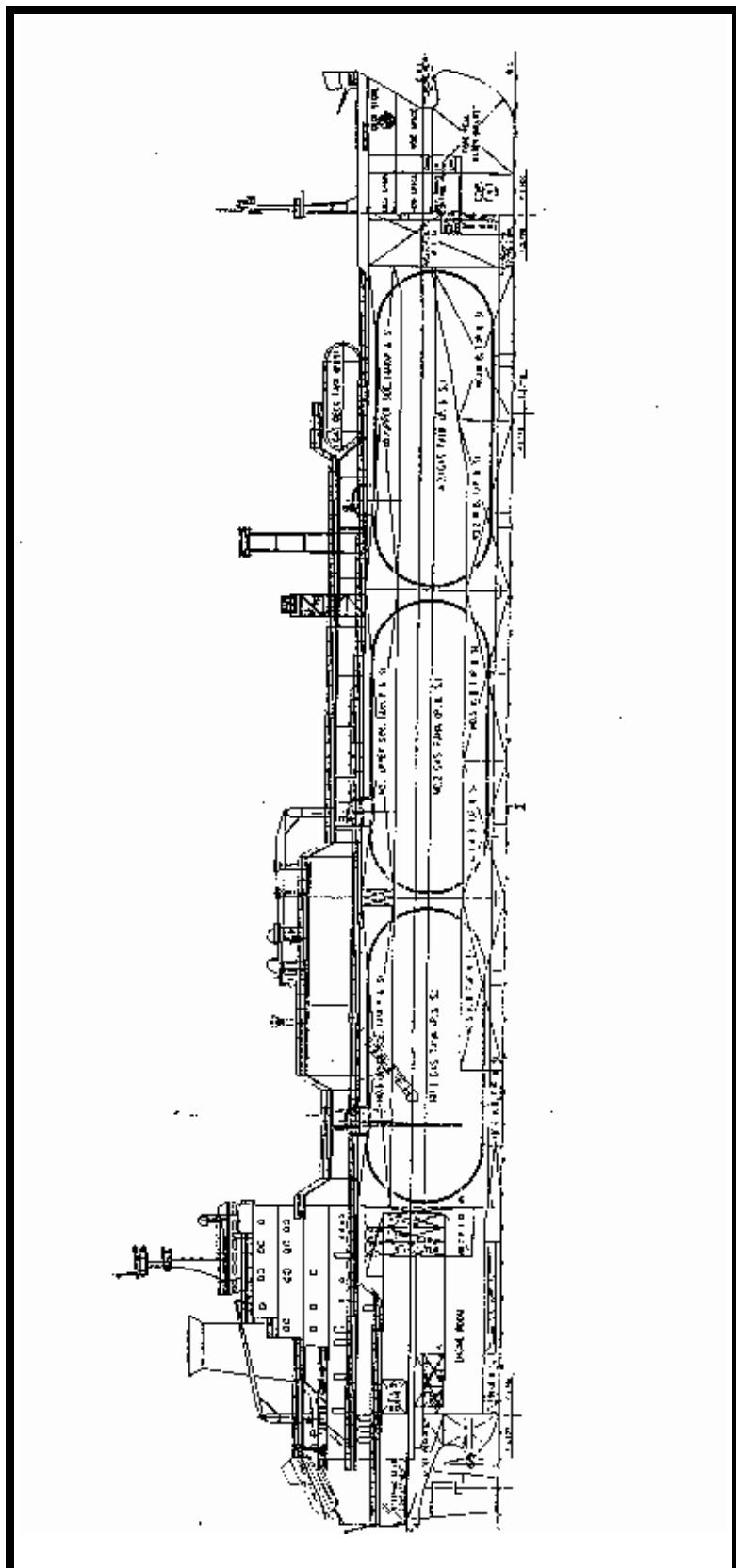
Appendix II



The diagram above depicts the positions of the crew in their working positions on the forecastle head prior to the incident. Then the positions in which each of the crew were found after the waves struck.

Appendix III

Profile of the “Johann Schulte”



Appendix IV

Diagram 1

Meteorological Office - Swell and sea contours / Wind direction / Swell direction chart
for the 2nd March 2000 at 0000 Z

Position of vessel at 0000 Z, Course 255 degrees true

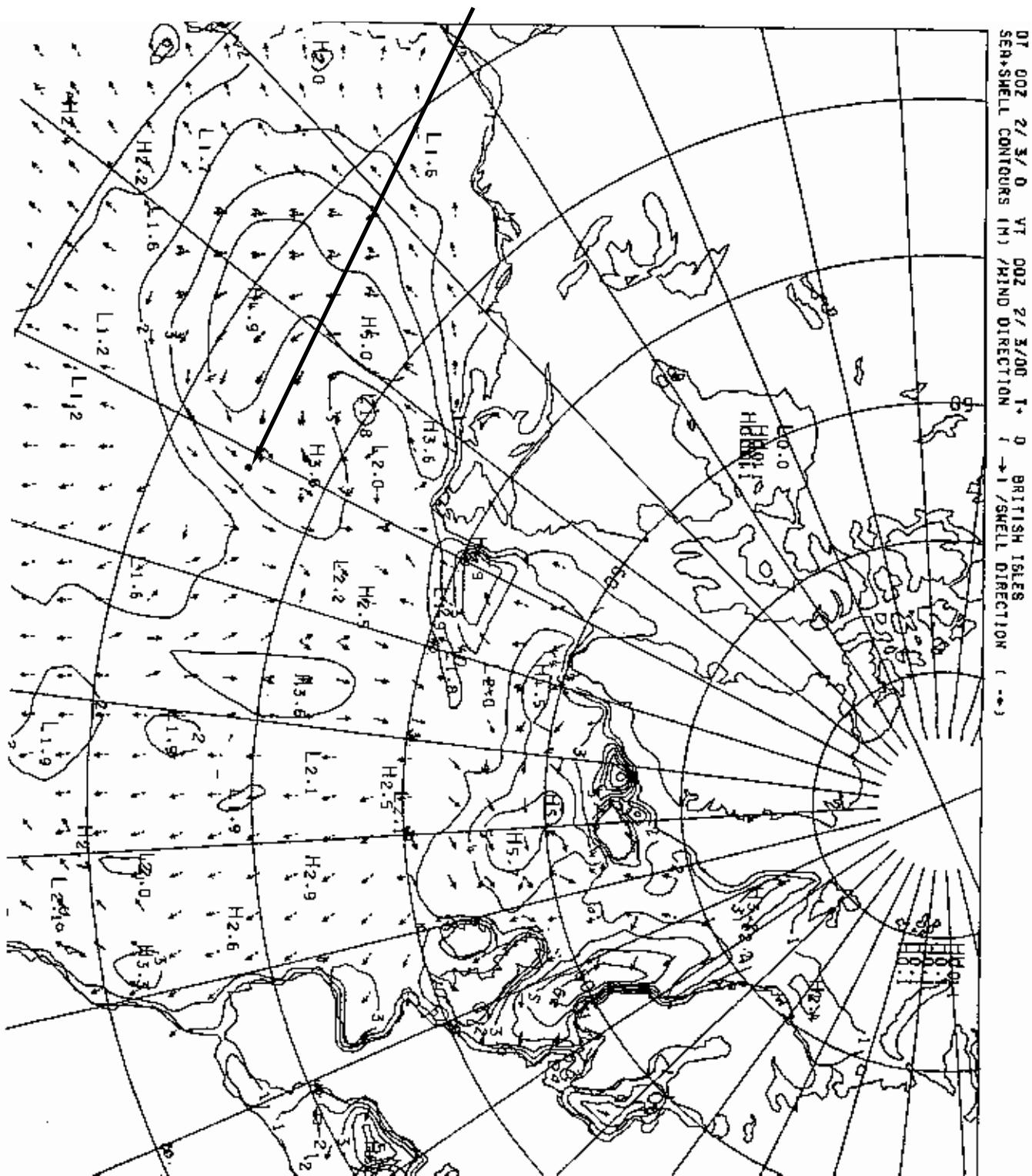


Diagram 2

Synopsis Chart

Position of vessel at 0000 Z, Course 255 degrees true

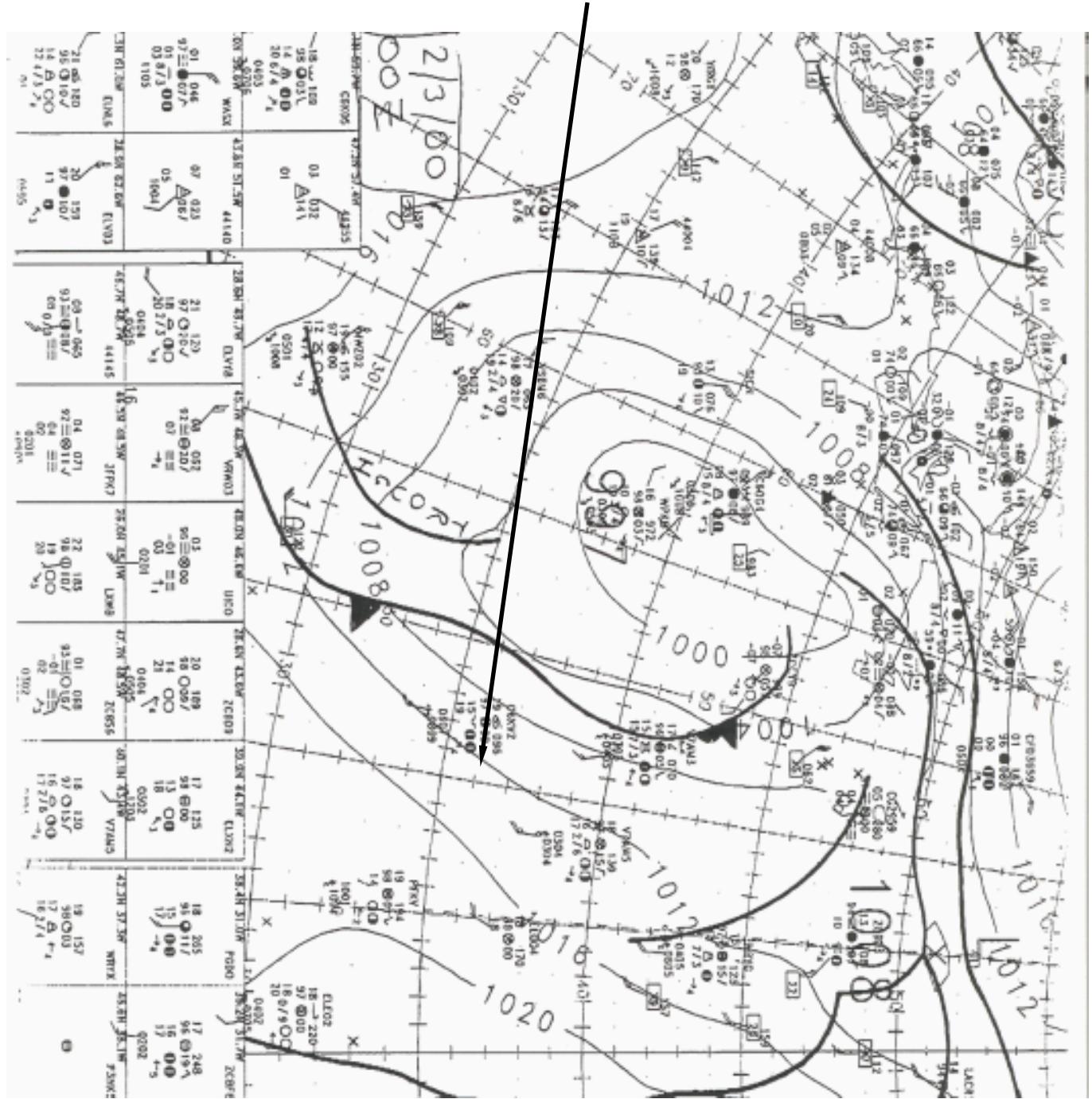


Diagram 3

Synopsis Chart

Position of vessel at 0600 Z, Course 255 degrees true

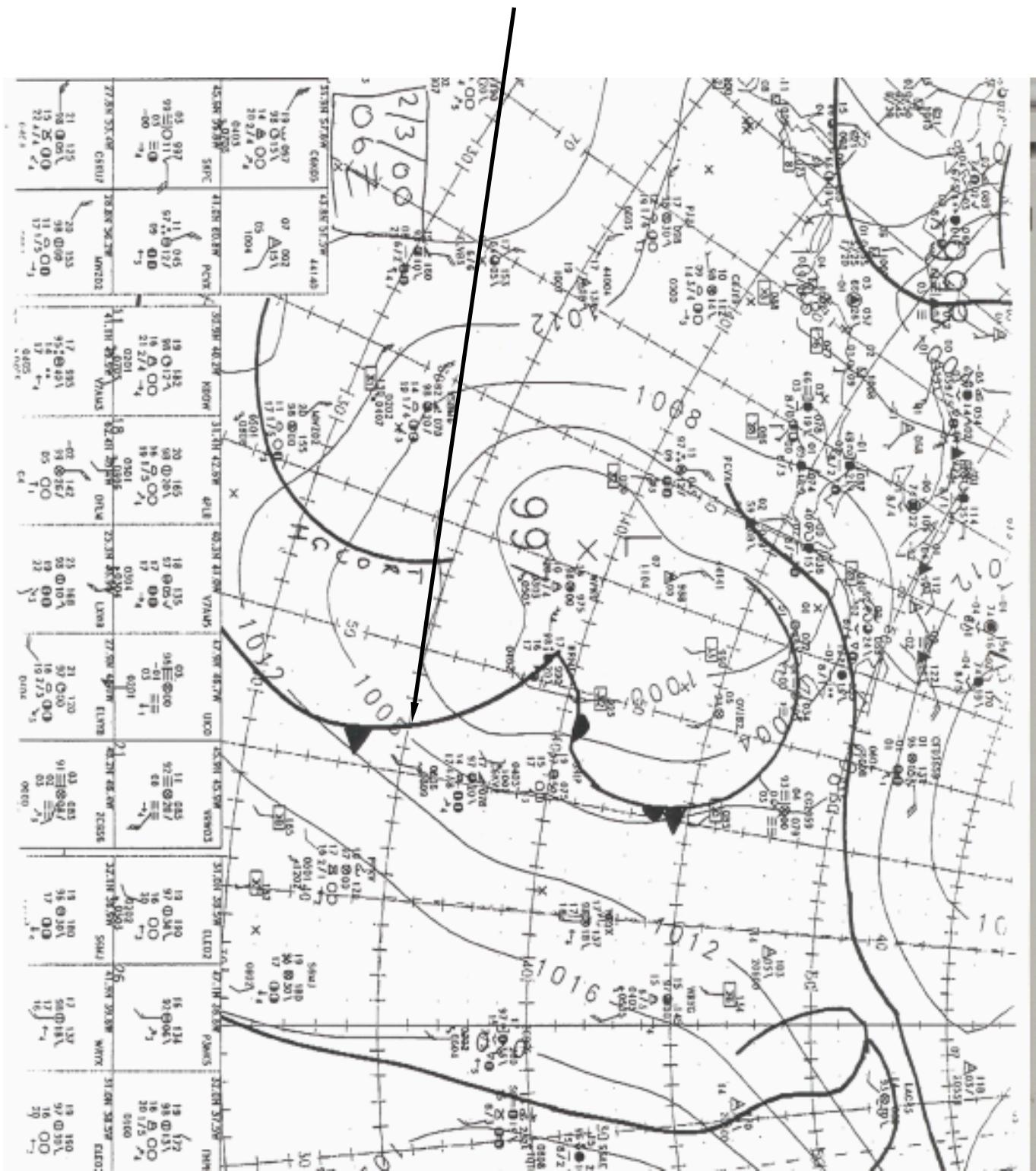
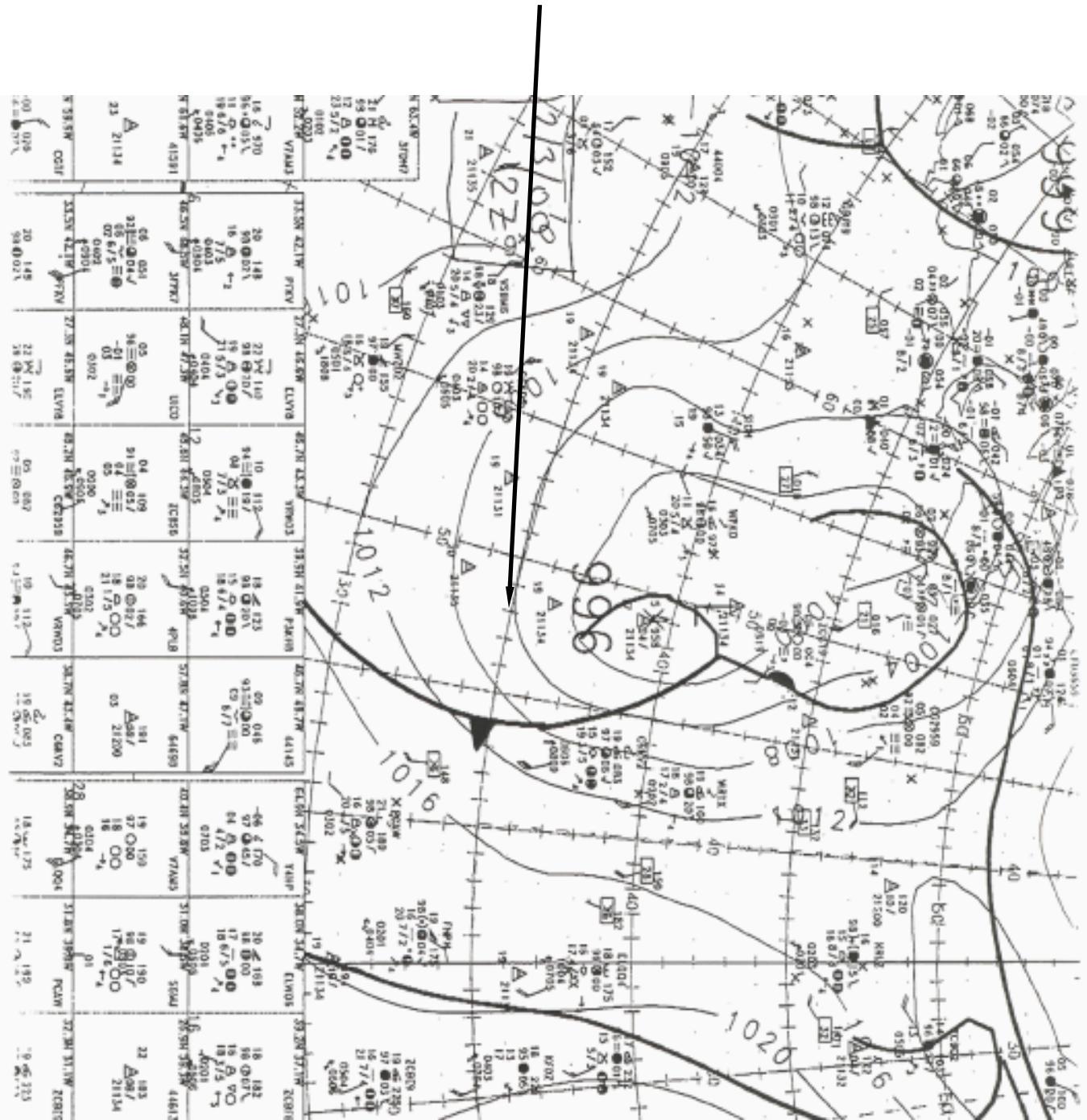


Diagram 4

Synopsis Chart

Position of vessel at 1200 Z, approximately 20 minutes after the incident



Part 9

Acknowledgements

Dorchester Maritime Limited, operators of the “Johann Schulte” and their agents in Bermuda,
Atlantic Marine

Master, Officers and crew of the “ Johann Schulte ”

Government of Bermuda

- Department of Marine and Port Services
- Principal Marine Surveyor and Senior Nautical Surveyor
- Assistant Registrar of Shipping
- Bermuda Police Department
- RCC Bermuda

Royal Hospital Haslar

United Kingdom Meteorological Office - National Archive Section

United States Air Force

United States Coast Guard - RCC Norfolk and RCC Miami