



**Bundesstelle für Seeunfalluntersuchung**  
**Federal Bureau of Maritime Casualty Investigation**  
Federal Higher Authority subordinated to the Ministry of Transport,  
Building and Urban Affairs

Investigation Report 637/06

**Very Serious Marine Casualty**

**Fatal accident involving two crew members  
as well as personal injury to two other  
crew members  
on board the M/V CAP EGMONT  
on 28 December 2006  
off the Japanese coast**

The investigation was conducted in conformity with the law to improve safety of shipping by investigating marine casualties and other incidents (Maritime Safety Investigation Law - SUG) of 16 June 2002.

According to this the sole objective of the investigation is to prevent future accidents and malfunctions. The investigation does not serve to ascertain fault, liability or claims.

The present report should not be used in court proceedings or proceedings of the Maritime Board. Reference is made to art. 19 para. 4 SUG.

The German text shall prevail in the interpretation of the Investigation Report.

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## 1 Summary of the marine casualty

On 28 December 2006 the container ship CAP EGMONT, sailing under German flag, was en route from Manzanillo/Mexico to Yokohama/Japan. The ship's route led through a sea area on the back side of a hurricane force low pressure system. After winds of a force of around 10 Bft in the morning of the day of the accident, the wind dropped over the course of the day to an average strength of 5 Bft, before it again increased up to 6 to 7 Bft. Conditions included sea state with significant wave heights of 5 m.

Towards 1620 h<sup>1</sup> the CAP EGMONT was on the high seas approx. 300 miles south-east of the Japanese coast when four crew members performing various tasks on the bow including backing up / tightening up the anchor lashings were struck by several strong waves washing over the deck. In the process, one of the seamen was swept over board. The three others were thrown by the waves, in some cases striking facilities installed on the forecastle. Thereby two seamen were injured. The third suffered fatal injuries.

While one team of crew members attempted resuscitation, the remaining crew was involved in search measures initiated by the ship's command. Resuscitation efforts in connection with the seriously injured seaman were unsuccessful. Darkness started to fall as early as 1700 h. Despite supporting search efforts that had in the meantime been initiated by a Japanese Coast Guard aircraft, the seaman who had gone overboard could not be found. In addition, towards 2100 h it also started to rain. The search was ultimately discontinued six hours after the accident owing to continuously deteriorating weather, and resumed the next day by the Japanese Coast Guard.

The CAP EGMONT continued its journey to Yokohama/Japan, where she arrived on 30 December 2006. The two injured seamen received medical attention in a Japanese hospital. One of the injured returned to his home country for six weeks' additional therapeutic treatment.

The seafarer who had been swept overboard was never found.

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<sup>1</sup> All times mentioned in the report refer to the time on board = Universal Time (UTC) + 9 hours.

## 2 Scene of the accident

Type of event: Very serious marine casualty  
Date/Time: 28 December 2006, 1620 h  
Location: High seas, southeast of Japan  
Latitude/Longitude:  $\phi$  34°12,6'N  $\lambda$  146°44,2'E

Detail of British Admiralty (BA) Chart 4510

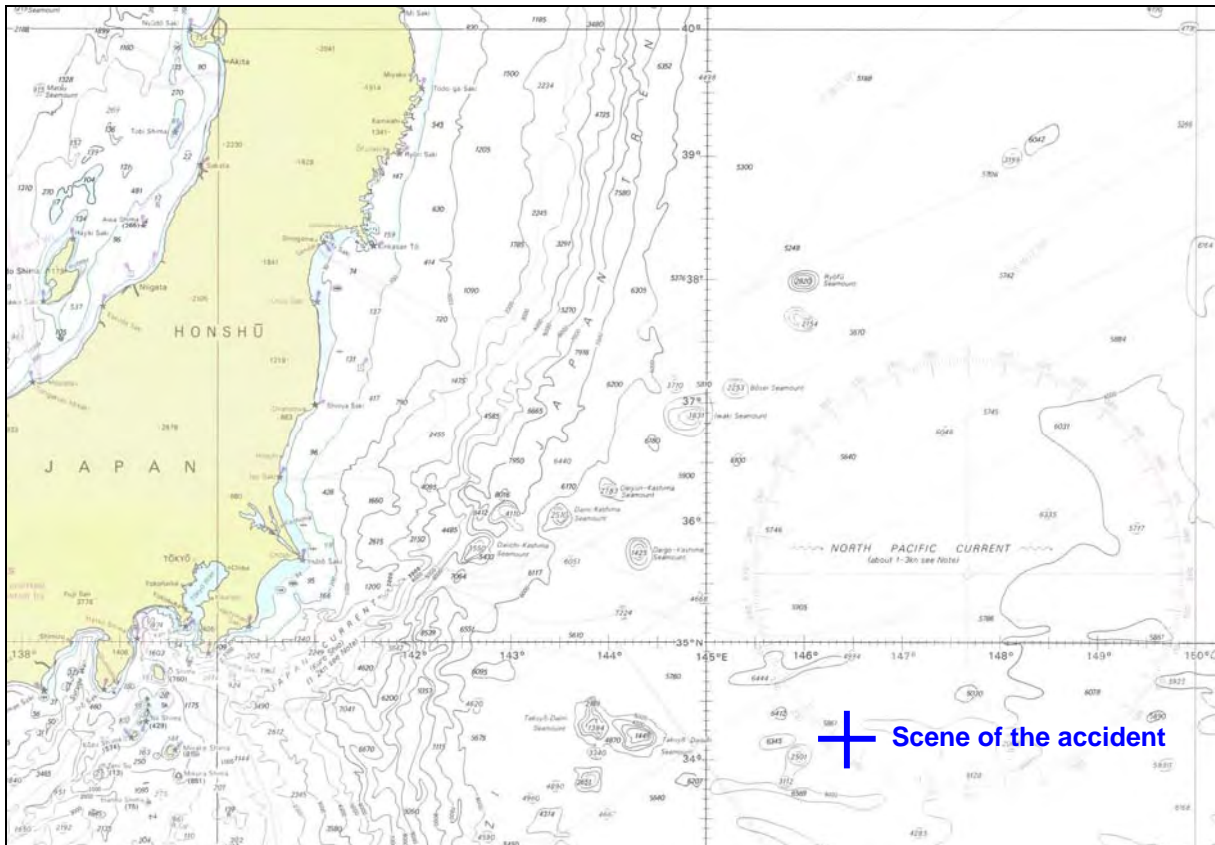


Figure 1: Chart

### 3 Vessel particulars

#### 3.1 Photo



Figure 2: Photo of the vessel

#### 3.2 Particulars

Name of the vessel:	CAP EGMONT
Type of vessel:	Container ship
Nationality/flag:	Germany
Port of registry:	Hamburg
IMO number:	9149304
Call sign:	DAYU
Owner:	Hammonia Reederei GmbH & Co. KG
Year built:	1997
Shipyard/yard number:	Kvaerner Warnow Werft GmbH, Rostock-Warnemünde/007
Classification society:	Germanischer Lloyd AG
Length overall:	208.16 m
Breadth overall:	30.04 m
Gross tonnage:	25,608
Deadweight:	34,015 t
Draught at time of accident:	Fore: 9.0 m Midships: 9.55 m Aft: 10,1 m
Engine rating:	19.810 kW
Main engine	2-stroke DMR MAN / B&W 7L70 MC Mk6
Service speed:	21.5 kts
Hull material:	Steel
Number of crew:	23

## 4 Course of the accident

### 4.1 Course of the voyage

On 28 December 2006 the container ship CAP EGMONT, sailing under German flag, was en route from Manzanillo/Mexico to Yokohama/Japan. The ship's route led through a sea area on the back side of a hurricane force low pressure system. The weather had deteriorated starting in the afternoon of 27 December 2006 onwards and until the early hours of the morning of 28 Decembers 2006. The CAP EGMONT pitched and rolled in westerly seas.

At around 0630 h the German Master, together with part of the Filipino deck crew, consisting of the Boatswain (Bosun), an Able Bodied Seaman (A/B) and an Ordinary Seaman (O/S), performed a safety inspection round on deck. All were wearing personal protective equipment (hard hat, safety belt, safety shoes and inflatable life vest). On the forecastle it was determined that during the night and as a result of the heavy weather several of the containers stowed in the second bay had been dented (cf. fig. 3). Furthermore, the forecastle telephone was missing, the outrigger boom of the pilot ladder on the port side was deformed and two fire extinguisher cabinets on the main deck were damaged.

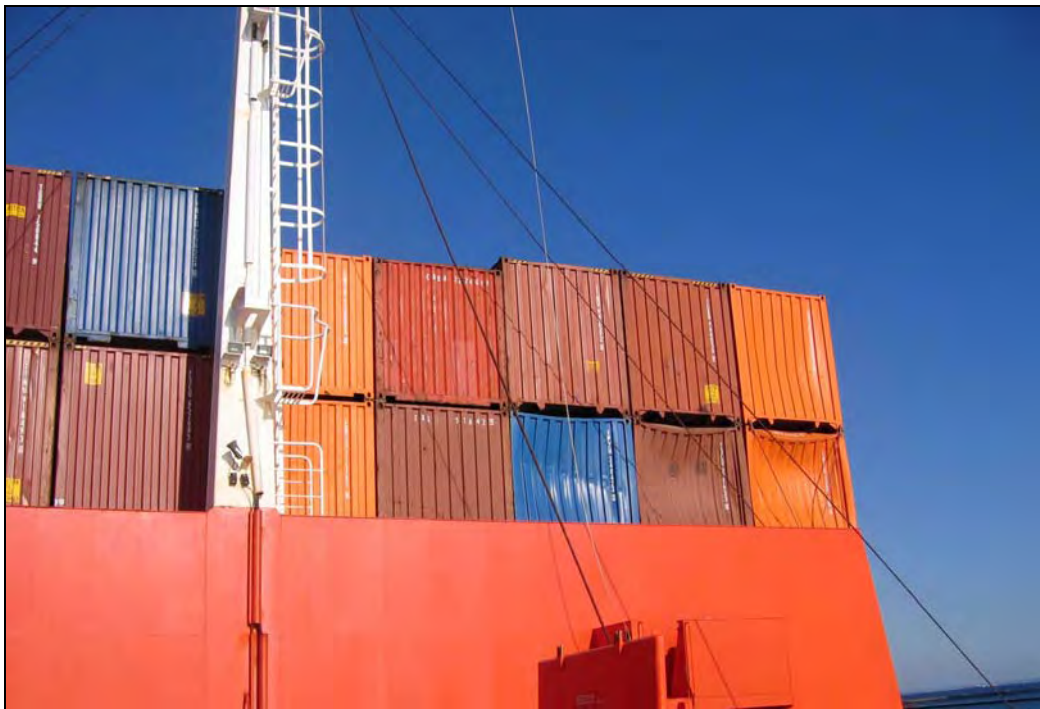


Figure 3: Damaged containers on board the M/V CAP EGMONT

The safety inspection round was used among other things in order to tighten the starboard anchor lashing. As the seas came from port and the weather conditions were altogether rough, the crew desisted from tightening up the port anchor lashing.

Towards 0700 h the Master and the Ukrainian Chief Officer (C/O) analysed the damage that had been ascertained. The Master issued instructions to inspect both



anchors before 1200 h and before 1500 h and to tighten their lashings if appropriate.

At around 1100 h the C/O and the deck crew went to the forecastle to inspect the anchors. Lashings on both anchors were tightened as instructed by the Master. While doing so the C/O ascertained that a few wing screws were missing from the hatch leading to the bosun store and the rope locker located beneath. The weather conditions did not permit closer examination of the damage.

At 1200 h the ship's course was altered at westerly winds from 320° to 290°. The ship proceeded with a speed from 13 to 14 knots. Until 1530 h the course was further altered to 270° when the wind had worked round to west-south-west. The ship's speed was about 15 knots. Sea state conditions included significant wave heights of up to approx. 5 m. Swell lay about 4 m at air temperature of approx. 18 °C.

According to the Master's instructions, at around 1520 h the C/O and the deck crew again went to the forecastle to inspect the anchors. No safety wires had been rigged there. Though it would have been possible to hook in a safety belt in the proximity of the anchor windlasses, as there were said to be lugs close to the anchor. The seamen in the deck crew wore neither hard hats nor inflatable life vests. They were accompanied by the Polish Third Officer, who was responsible for maintenance of the firefighting and safety equipment and who wanted to examine the damaged firefighting equipment cabinets on the forecastle. The C/O inspected the forecastle for further damage. He determined that the entry hatch to the bosun store and the rope locker area had been seriously damaged due to a ripped welding seam on the leading edge of the hatch coaming. A large hole had developed, through which water had entered the area (cf. fig. 4).



Figure 4: Damaged hatch entry on the forecastle

The C/O informed the Master of the damage, whereupon the latter came onto the forecastle at around 1530 h in order to view the damage in person. On this occasion it was determined that the bosun store located directly underneath the hatch entrance was partially submerged. The rope locker underneath was almost completely flooded. In addition, the C/O found that the turnbuckles for the chain of the port anchor securing had become inoperative.

The Master requested engine personnel to help pump out the water that had been taken on and instructed the Bosun to have the anchor securing chain repaired. He then returned to the bridge to rejoin the Second Officer who was officer on watch (OOW).

Towards 1605 h the German Second Engineer came onto the forecastle accompanied by part of the engine personnel. This second crew consisted of a German Third Engineer, a Filipino Oiler, a Filipino Wiper and a German Ship Mechanic. The crew went below deck and began installation of the mobile pump.

The C/O and the Third Officer went back to the superstructure together, where the C/O relieved the Second Officer from his watch and the Third Officer went to his cabin. After the C/O took over the watch, the Master turned towards the weather reports which in the meantime had been received in the aft section of the wheel house.

At approximately 1620 h the Filipino deck crew was busy tightening the lashings on the port anchor, when suddenly the CAP EGMONT was violently struck first by a tall wave and then by two other strong waves, with green water washing over the deck. The waves struck the ship slightly off the starboard bow, as meanwhile the wind's direction as well as the ship's course had altered. At this point, the CAP EGMONT was approx. 300 miles south east of the Japanese coast.

The engine crew Wiper, who was standing on deck in order to connect the compressed air hose for the mobile pump, was able to hold on by his own strength to a deck stanchion and sustained slight injuries. He and the Bosun, who had been flung against forecastle facilities by the flooding sea, found the O/S to have sustained critical injuries and to have lost consciousness. The third member of the deck crew, the A/B, could not be found. The bridge was informed of the accident via the telephone in the bow thruster room.

The Master, who had taken the call from the bow thruster room, sent the C/O and the Second Officer on deck to ascertain the magnitude of the incident. Both reached the forecastle at approximately 1635 h. After consultation with the Bosun, the C/O reported from the bow thruster room back to the bridge that the A/B had presumably been swept overboard and that the O/S was seriously injured. Thereupon the general

alarm was sounded, and the emergency 'man over board' (MOB) button on the GPS and the 'Event' button on the electronic chart were pressed to store the accident position.

Because of the complex accident situation, the ship's crew was split up into two rescue teams. The Master initiated on the one hand the MOB emergency plan in connection with the search for the missing A/B, and on the other the first aid emergency plan for the critically injured O/S.

Within the scope of the MOB emergency plan, the entire deck lighting including the searchlights was switched on. On the bridge, a distress message was sent via SAT-C telex and digital selective call (DSC Controller) by radio, reporting MOB and a critically injured crew member. The Maritime Rescue Coordination Centre - MRCC Gris Nez thereupon reported the emergency situation to the Japanese Coast Guard, which in turn contacted the CAP EGMONT via SAT-C telex. The Master assigned a German Ship Mechanic Trainee as well as an Electrician and an Electrician Cadet, both of Romanian nationality, to the lookout positions in the bridge wings. On deck the search measures were managed by the C/O. Additional lookouts were posted on deck and survival suits as well as life jackets were laid out. The search for the missing crew member was expanded from the forecastle area to the main deck, but remained unsuccessful. Towards 1655 h the C/O returned to the bridge, where after a short briefing he took over the responsibility for navigating search courses.

Medical first aid for the critically injured crew member was provided at the same time as the search for the missing seaman was begun. The Second Officer was in charge of the rescue team. He gave the stretcher to the Filipino Steward and prepared the ship hospital. The rescue team was supplemented by the Third Engineer, the Ship Mechanic and another German Ship Mechanic Trainee, who had received paramedical training and had three years' professional experience in that area. The critically injured seaman was transported into the ship hospital, where cardio-pulmonary reanimation/resuscitation (CPR) was started. The seaman's serious head and back injuries were bandaged with compresses.

Towards 1700 h the Master enquired in the hospital about the status of the critically injured crew member and thereupon reported the emergency situation to the shipping company in Hamburg via SAT-B telephone. The shipping company's crisis staff in turn informed the Maritime Rescue Coordination Center in Bremen as well as MEDICO Cuxhaven (Telemedical Maritime Assistance Service), and kept in contact with the CAP EGMONT via SAT-C.

Darkness started to fall as early as 1700 h. The crew of the CAP EGMONT searched for the missing seaman first at the accident location itself and then in the immediate vicinity. The accident area was criss-crossed in increasing distances and the search was shifted eastwards, since both wind and current were easterly setting.

Two telephone conversations took place between MEDICO and the ship's command at around 1800 h, in which information and instructions were exchanged in regard to the reanimation of the critically injured crew member and the survival chances of the missing seaman. In spite of all efforts, resuscitation measures carried out over a period of more than two hours were to no avail, so that the O/S was pronounced dead at 1845 h. Starting at 1905 h, the crew members no longer needed for first aid activities were posted on deck as additional lookouts in the search for the missing seaman.

A Japanese Coast Guard aircraft manned with a search team arrived on the scene of the accident at 1910 h and obtained information concerning the missing and the deceased seaman via VHF Channel 16. Search patterns were flown until 1935 h. The weather conditions had again deteriorated in the course of the evening. Both wind and waves increased in strength and the sky was cloudy. Visibility was impaired by occasional rain showers. Owing to the significant distance to the coastline, the airborne search had to be interrupted at that time in order to ensure safe return to base of the Japanese search team. No other vessels had responded to the CAP EGMONT's distress calls, so that the latter continued the search alone.

Towards 2230 h the CAP EGMONT's command decided to discontinue the ship based search. At this point in time the crew had spent more than six uninterrupted hours on search and rescue duty. Before the ship continued its journey to Yokohama/Japan at reduced rpm's, a sound signal was given (three long blasts). No sound signals from other ships were heard.

The Japanese Coast Guard returned the following morning at around 0710 h by aircraft to the scene of the accident and conducted a wide-ranging search for the missing seaman. The search was finally given up definitively at 0840 h owing to the missing crew member's low chances of survival in the prevailing weather conditions.

The CAP EGMONT arrived in Yokohama on 30 December 2006; injured crew members received medical care at the Honmoku Hospital. One of them returned to his home country for further treatment and resumed service on another ship 1.5 months later.

The seafarer who had been swept overboard was never recovered.

#### **4.2 Additional information provided by crew members**

According to information received, after having carried out the safety inspection round in the morning of 28 December 2006 all crew members were once again explicitly reminded of the need always to wear personal protective equipment for the planned work due to take place on the forecastle.

Pumping out the rope locker and the bosun store was said to have been necessary due to the amount of water taken on. Towards 1535 h weather conditions were said to have improved to such an extent that the entire forecastle could be viewed without

problems. Already in the course of the morning there were said to have been hardly any whitecaps to be seen. The CAP EGMONT's freeboard is said to have been approx. 6 to 7 m.

Work on the chain of the anchor securing had been ordered because there had allegedly been a concern that if an anchor were to come loose it could smash a hole into the ship's side.

The telephone communication concerning the accident was said to have taken place in a hectic, not easily understandable tone, so that the C/O and the Second Officer were ordered on deck to clarify the situation.

Weather conditions were said to have subsided before the accident to the extent that the crew was able to go on deck between the accommodation block and the forecastle without needing to hold on in any way. This was said to be the reason why the two deceased seamen chose not to hitch.

### **4.3 Consequences of the accident**

#### **4.3.1 Injuries**

The three strong waves that had come over the stem resulted in significant injuries, fatal in one case, to three of the four crew members working on the forecastle at the time of the accident.

The A/B was swept over board and was never found, so that a fatal outcome must be assumed.

The O/S suffered critical head, back and lower leg injuries that led to his death. No autopsy was carried out on him in Japan. The photographic documentation of the injuries was however subsequently evaluated by the Forensic Institute of the Hamburg-Eppendorf University Clinic. The results of this evaluation are reproduced under item 5.2.9. below.

Medical examination reports were however produced for the two seamen treated at Honmoku Hospital in Japan; these reports were made available to BSU. They indicated that the Bosun had suffered contusions in the chest and neck area. The seaman was signed off on medical recommendation and was sent home for a period of 50 to 60 days for further convalescence. This recommendation was complied with.

The engine crew member was diagnosed with contusions to the left thigh, the right shin and the thoracic cage. This seaman was able to continue his service on board the CAP EGMONT in spite of his injuries.

#### **4.3.2 Further damage**

The damage ascertained on board the CAP EGMONT was not a result of the accident. No environmentally harmful substances were released.

## 5 Investigation

The accident took place on the high seas off the eastern coast of Japan, and the CAP EGMONT only reached Yokohama, its next port of call, two days later. There was immediate close and ongoing co-operation between the investigating authorities and the parties involved. For the BSU's marine casualty investigation, documents and information were made available among others by the See-Berufsgenossenschaft (See-BG), which entrusted the Germanischer Lloyd (GL) with the inspection of the CAP EGMONT in Yokohama; by the Japanese Coast Guard; by the German Federal Police, which conducted a parallel investigation; by the MRCC Bremen; by the Maritime Emergencies Reporting and Assessment Centre of the Central Command for Maritime Emergencies in Cuxhaven, and last but not least by the owner of the CAP EGMONT, which was receptive in respect to the investigation conducted by the BSU.

### 5.1 Survey of the CAP EGMONT

The GL inspected the CAP EGMONT by order of the See-BG on 30 December 2006 once the vessel had tied up in Yokohama/Japan. Copies were made of all relevant ship documents, plans, notes and reports, and comprehensive photographic documentation of the CAP EGMONT's forecastle area was compiled. These documents were made available to the BSU to their full extent together with an inspection report from the GL for further appraisal.

On the basis of the quality of the documentation concerning the area of the forecastle in which the accident took place and the fact that no visible traces of the accident were found there, the BSU waived a separate inspection.

### 5.2 Investigation by the BSU

#### 5.2.1 Propulsion and manoeuvring characteristics

The CAP EGMONT is powered by a two-stroke diesel engine with a nominal output of 19,810 kW. Propulsion is by means of a fixed right-handed propeller arranged centrally aft. The vessel has an 850 kW bow thruster.

The rudder assembly comprises a semi-spade type rudder with a maximum rudder angle of 35°. The time needed to change from the 'hard to port' to 'hard to starboard' rudder position and vice-versa (hard over to hard over) is 28 seconds when using a pump and 14 seconds when using two pumps. According to the CAP EGMONT's speed table the following revolutions per minute (rpm) and speeds were attained in 'Ahead' manoeuvres:

Engine manoeuvre	rpm	Average speeds in knots	
		loaded draught = 11.40 m	in ballast draught = 7.60 m
Full ahead (sea)	108	21.0	22.2
Full ahead (manoeuvre)	88	18.5	18.5
Half ahead	65	13.2	13.5

The bridge provides no possibility to adjust the main engine's revolution frequency precisely. An approximate revolution speed is determined by the position of the engine telegraph. A precise revolution frequency can be adjusted in the engine control room.

For the stopping distance ('Full ahead' to 'Full astern') of 15.5 cable lengths the ship needs 416 seconds.

The CAP EGMONT is fitted among other systems with AIS, ARPA (S-Band and X-Band), two GPS receivers, one autopilot system and an ECDIS system. On the day of the accident navigation proceeded following paper chart BA 4053 (North Pacific Ocean Northwestern Part).

### 5.2.2 Forecastle area of the CAP EGMONT

The arrangement of the anchor windlasses and of the hatch to the bosun's store and the rope locker underneath is illustrated by the following detail from the general plan drawings of the CAP EGMONT (fig. 5) and by the additional photomontage (fig. 6<sup>2</sup>).

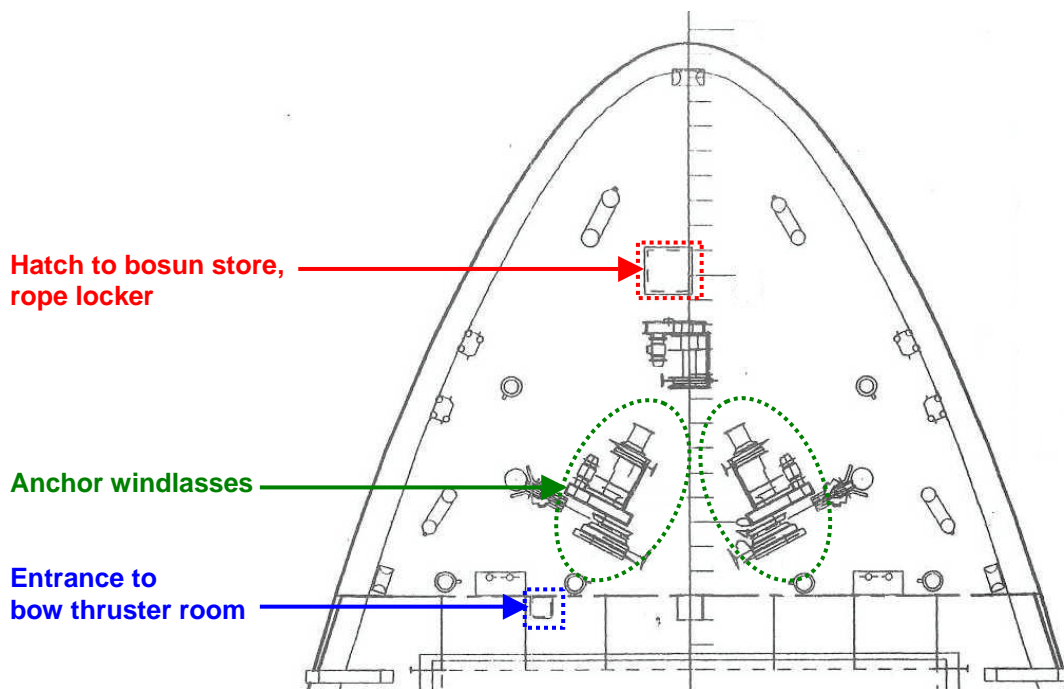


Figure 5: Drawing of the forecastle area of the CAP EGMONT

<sup>2</sup> The photographs of the CAP EGMONT's forecastle were taken in June of 2007 and combined to a photomontage to provide a general overview. This results in slight perspective distortions.

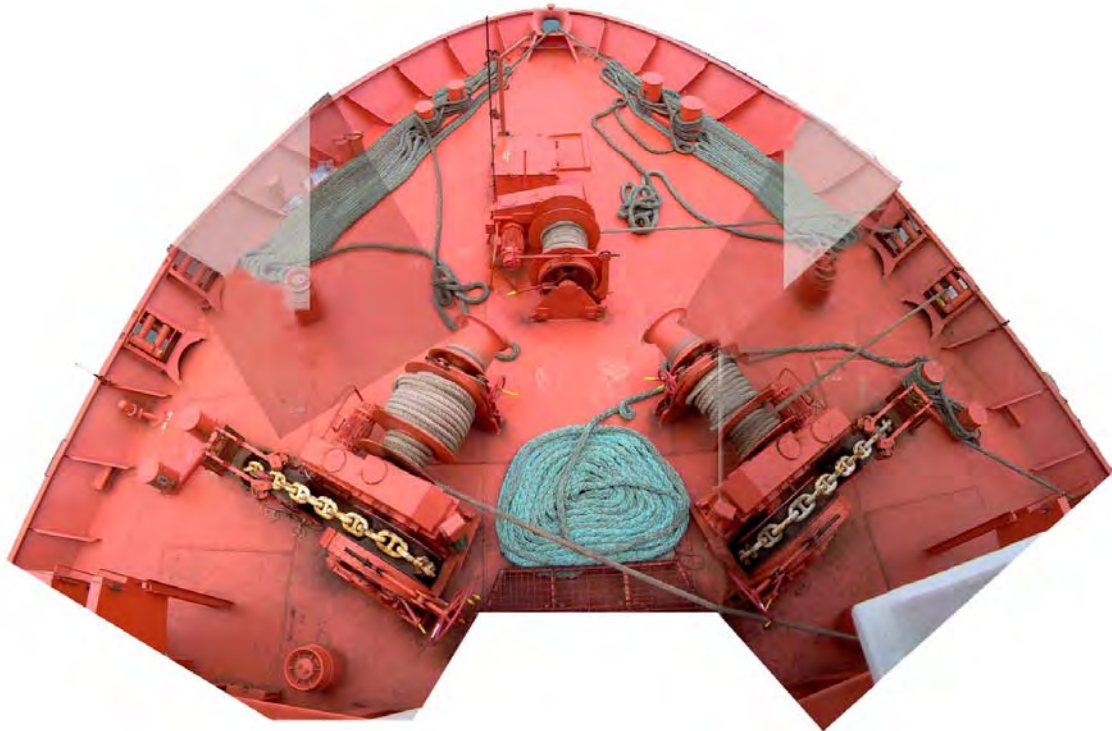


Figure 6: Photomontage of the forecastle area of the CAP EGMONT

There is no connection between the bosun's store or the rope locker and the CAP EGMONT's bilge. The bosun store can be accessed via the entrance to the bow thruster room.

On the day of the accident and owing to the absence of safety wires and/or a surrounding grab rail there were only very limited options for safeguarding against going overboard by means of hitching via a safety line connected to a life belt.

### 5.2.3 Vessel routeing and plotted course

The CAP EGMONT's route regularly takes it from the western coast of South America and via Central America to Asia. Various itineraries for crossing the Pacific Ocean are available on board the ship. A weather information service ordered by CAP EGMONT's charterer provided routeing for the transpacific voyage in December 2006. This route suggested heading for the Nojima Saki lighthouse in Japan from waypoint 27° N 150° E.

On 24 Dezember 2007 the Master deviated from this route to the extent that the lighthouse was to be directly headed for from waypoint 27° N 180° W. This deviation was acknowledged by the weather information service via telex, which additionally stated that similar conditions were to be expected along all routes.



The following overview chart<sup>3</sup> shows details of the original and the changed itinerary (Nojima Saki approach) as well as waypoints, indicating the courses actually plotted by the CAP EGMONT as recorded in the bridge log (fig. 7).

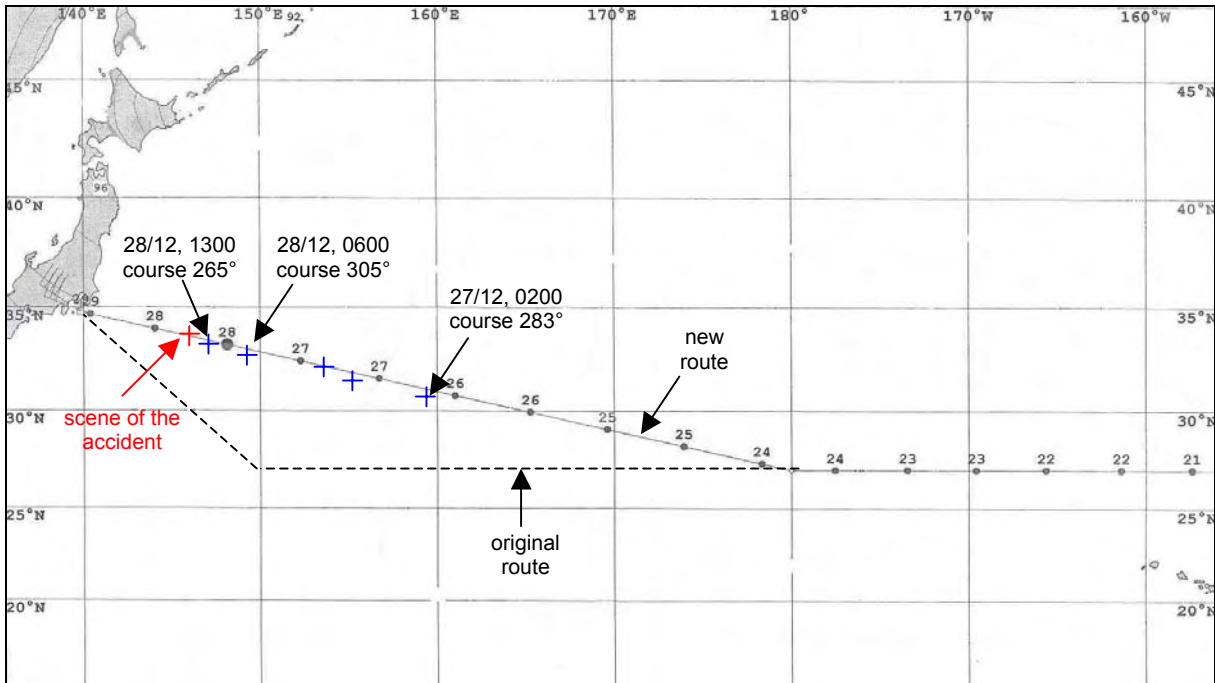


Figure 7: Overview chart with planned routes and plotted courses

The figures entered on the new route refer to the days of the month of December on which the CAP EGMONT was on its voyage from Central America to Japan.

According to the bridge log and the ECDIS records, in the early morning hours of the day of the accident the ship was sailing course 283°. At 0600 h the course was altered to 305°. When the wind clocked from west to west-northwest, the course was altered to 315° at 1100 h. From 1300 h onwards the CAP EGMONT proceeded on a course of 265° under once again westerly winds, and even after a further change in wind direction to west southwesterly this course was maintained - with slight variations - until the accident notification was received. Thereafter, a number of different courses were navigated during the search for the seaman who had gone overboard, before the CAP EGMONT resumed its voyage on course 276° in the direction of Yokohama.

Overall the new route followed by the CAP EGMONT on the day of the accident ran significantly further north than the original itinerary.

<sup>3</sup> The chart was obtained from the weather information services ordered by CAP EGMONT's owner (cf. Fig. 9). The weather information was removed for greater clarity.

#### 5.2.4 Organisational guidelines and procedures on board

The organisational safety procedures on board the CAP EGMONT provide for regular safety committee meetings. The safety meetings were attended by the Master, the Safety Officer (C/O), the Chief Engineer, the Safety Warden (Second Engineer), the Third Officer, the Bosun as representative of the deck crew, and the Engine Fitter and the Ship Mechanic as representatives of the engine crew.

Following a meeting, the remaining crew members are supposed to be informed by their respective representatives of the subjects discussed. Independently thereof, the results of the safety meetings are also displayed e.g. in the crew mess.

The last safety meeting before the accident had taken place six days earlier, on 22 December 2006. The agenda reveals among other things that the C/O had reminded the crew to wear personal safety equipment when working on deck or in the engine room.

The full personal protective equipment to be worn as made available by the owner is illustrated in the following photographs (fig. 8).



Figure 8: Full personal protection equipment as intended to be worn for work on deck

In addition to the safety meetings, weekly safety drills and exercises are also held on board the CAP EGMONT, during which the necessity of wearing personal protection appropriate to the weather conditions equipment is generally pointed out. According to the minutes of the safety meeting, the last drills before the accident were intended to take place on 27 December 2006, i.e. one day before the accident. The planned activities included a fire fighting exercise, first aid measures and lifeboat manoeuvres.

According to the Accident Prevention Regulation for Shipping Enterprises (UVV-See) issued by the See-BG, all safety exercises carried out are to be recorded in the

bridge log<sup>4</sup>. For 27 December 2006 an actual inspection of the rescue material was noted<sup>5</sup>, but there is no record that the originally planned safety exercises were carried out. It must therefore be assumed that the exercises planned for 27 December 2006 were postponed. Independently thereof, on the day of the accident both the splitting of the crew into two rescue teams and also the performance of the rescue and resuscitation measures reportedly worked well.

### **5.2.5 Human factor**

On the day of the accident there were 23 crew members of five different nationalities on board the CAP EGMONT. The ship's Minimum Safe Manning Certificate calls for a minimum crew of 16. The ship's owner uses various crewing agencies to recruit crew members. The seamen's ranks on board are filled exclusively with Filipino seafarers. Crew assignments after recruiting are effected centrally via an agency based in the Philippines.

The two deceased crew members had both been on board for several months before the accident, and were therefore familiar with the vessel and its procedures. It can be assumed that they were aware of the requirement to wear personal protective equipment when they were instructed to go to the forecabin in heavy weather. There are no indications of general communication difficulties on board the CAP EGMONT. The communication between the mostly Filipino crew and the Master and/or the officers was facilitated on board the ship by the fact that instructions and information, including those concerning safety aspects of work on deck, could be relayed by the Bosun in the Filipino language. The fact that the call reporting the accident was not easily comprehensible on the bridge can be ascribed to the actual accident situation and the caller's excitement in this connection.

There are no indications that the crew members had consumed alcohol or any similar substances beforehand.

No deficiencies relating to the "human factor" had been found to exist on board the CAP EGMONT in the six port state inspections that had been carried out since June of 2003.

### **5.2.6 Weather situation and sea state conditions**

There are different representations in regard to the weather situation prevailing in the waters navigated by the CAP EGMONT on the day of the accident.

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<sup>4</sup> Pursuant to § 54 of the UVV-See in conjunction with the implementation directives of the See-BG in reference to § 52 of the UVV-See, safety exercises constitute factual information that must be recorded in the relevant logs.

<sup>5</sup> It reads: 'weekly test of lifeboat and rescue boat; engines done - all ok; weekly inspections of LSA and FFA done'. Pursuant to § 289 of the UVV-See in conjunction with the implementation directives of the See-BG in reference to § 52 of the UVV-See, the checking of life-saving appliances must be recorded as well.

Verification of the weather and in particular of the sea state conditions prevailing on the day of the accident was an essential element of the investigation.

### 5.2.6.1 Information obtained from the bridge log of the CAP EGMONT

The following entries can be found in the bridge log of the CAP EGMONT for 28 December 2006 in connection with the weather situation<sup>6</sup>:

Time	Barometer hPa	Temperature Air °C	Wind Direction	Wind Force	Sea-scale	Swell
0100	1001	20 <sup>5</sup>	WSW	9	8	W/4
0200	1001 <sup>5</sup>	20	W	9	8	W/4
0300	1002	20	W	9	8	W/6
0400	1002	20	W	9	8	W/6
0500	1002	21	W	9	7	
0600	1002	22	W	9	7	
0700	1003	22	W	9	7	
0800	1004	22	W	9	7	
0900	1004	22	W	9/10	8	W6
1000	1004	23	WNW	11	8	W6
1100	1003	23	WNW	10/11	8	W6
1200	1002	23	WNW	10	8	W6
1300	1002	21	W	9	8	W/6
1400	1002	21	W	8	7	W/6
1500	1002	20	WSW	7	6	WNW/6
1600	1003	18 <sup>5</sup>	WSW	7	6	WNW/6
1700	1002	18	WSW	5	6	W-5
1800	1001	18	WSW	4	6	W-5
1900	1000	18	WSW	5	6	W-5
2000	999	18	WSW	6	6	W-5
2100	997	18	WSW	7	6	W-5
2200	995	18	WSW	7	6	W-5
2300	995	18	WSW	7	6	W-5
2400	994	18	WSW	8	7	W-5

According to these entries, the storm had slightly subsided in the early hours of the afternoon. At the time of the accident there was only a strong breeze. Typically, such wind conditions at sea will be combined with fairly large waves with breaking crests. According to the bridge log, the wind freshened again towards the evening.

The wind conditions as aforesaid could not be verified with ECDIS-records because no weather data has been retained (cf. fig. 12 to 14).

### 5.2.6.2 Information from the weather information services used on board

The vessel routing carried out by the ship's command of CAP EGMONT was advised by two separate weather information services.

<sup>6</sup> Time of accident being marked.

The service ordered by the ship's owner delivers actual maritime data by means of a satellite broadcast using the ship's SAT-B. The data is provided directly to the ship where it is graphically displayed using a dedicated broadcast receiver. After entering the route's waypoint data, a date of departure and an average voyage speed, the anticipated ship's position as well as a weather forecast are displayed graphically on a monitor. 3- and 10-day forecast data is received.

On the basis of the information available on 23 December 2006, that service provided a weather routing forecast for 24 December 2006 and the following days in the form of the weather chart reproduced below (fig. 9)<sup>7</sup>.

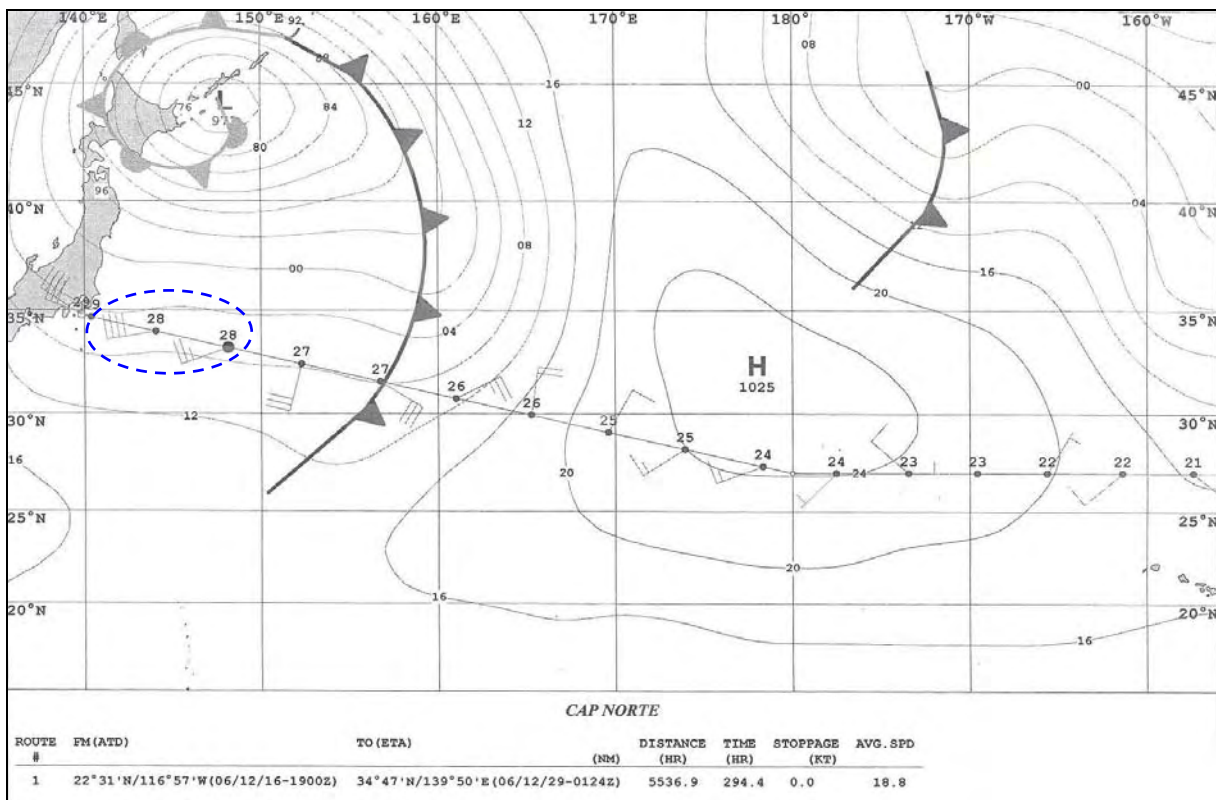


Figure 9: Weather chart produced by the ship owner's weather information service of 23 December 2006 for 24 December 2006

For 28 December 2006 the forecast included a fresh breeze to gale force winds with speeds of between 25 and 40 knots (cf. fig. 9, blue edge). Twenty-five knots correspond to a strong breeze, 40 knots to gale force winds, corresponding in turn to 6 to 8 Bft.

Furthermore the vessel's routing onboard the CAP EGMONT relied on a weather information service acting on behalf of the charterer. That service provides satellited weather information as well as vessel routing advice. Information had been passed on regarding ship's data as e.g. draught, the metacentric height (GM) and the bunker level prior to the passage, whereupon the company generally provides a suggested

<sup>7</sup> The name CAP NORTE stated in the weather chart is the ex-name of the CAP EGMONT. The software displays the first waypoint of the respective day of the voyage, to which the forecast refers, visually larger.

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route. On 23. December 2006 the weather chart reproduced below was provided (cf. fig. 10). Chart print-outs for previous or following days were not available to the BSU for further appraisal.

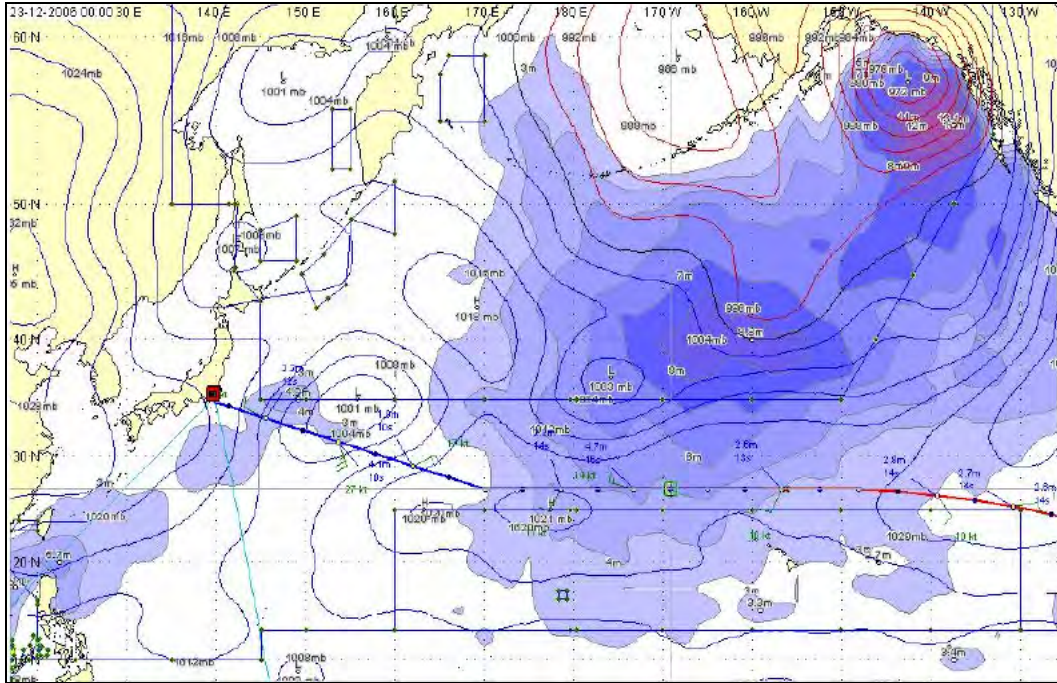


Figure 10: Weather chart produced by the charterer's weather information service of 23 December 2006 for 23 December 2006

The weather chart produced by the other weather information service for the same day is reproduced below to allow proper comparability (fig. 11).

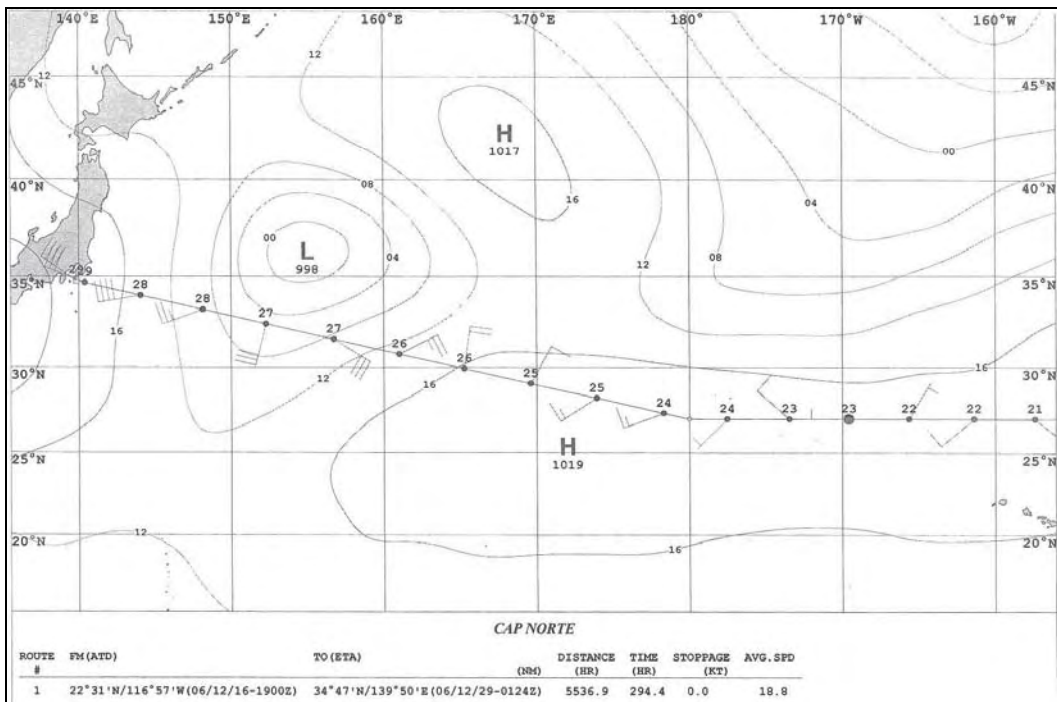


Figure 11: Comparable weather chart of the ship owner's weather information service of 22 December 2006 for 23 December 2006

By way of comparison both weather charts correspond in mapping the high and low pressure areas. Minor divergences appear with regard to the wind forecast: According to figure 10 the forecast included winds with speed of 25 knots whereas winds with speed of 30 knots were expected according to figure 11 (6 to 7 Bft). No wind forecast for the day of the accident has been provided in figure 10.

### **5.2.6.3 Verbally provided information**

The GL inspector was told on 30 December 2006 in Yokohama that shortly before the accident the weather had been sunny and slightly cloudy. The wind direction was said to have been approximately 230°, at 3 to 4 Bft. The swell was reported to have been 4 m, from the same direction as the wind. The entries in the bridge log concerning the sea-scale were said to be too high.

Based on the entries concerning the time of the accident, which recorded 7 Bft decreasing to 5 Bft, a lower assumption would correspond to a moderate breeze (4 Bft). With hindsight BSU has been informed that the windspeed at the time of the accident should be estimated approx. 5 Bft.

Regarding the vessel's routing, BSU has been informed that the original route had been altered on 24 December 2006 according to the weather information received. The message of the charterer's weather information service is said to have been relied on, whereupon similar conditions were to be expected along all routes.

### **5.2.6.4 Warnings from the Japanese meteorological service**

On 28 December 2006 the Japanese meteorological service had issued gale warnings for the sea area east of Japan. The warnings read as follows<sup>8</sup>:

'28 December 2006, 0535 h  
(...) Storm warning.  
Developing low 964 hPa  
At 42N 149E sea east of Japan moving eastnorthneast 20 knots.  
Occluded front from 43N 149E to 43N 151E 39N 158E.  
Warm front from 39N 158E to 33N 160E 29N 162E.  
Cold front from 39N 158E to 31N 155E 26N 150E.  
Winds 30 to 60 knots within 1200 miles of low southeast semicircle and 900 miles elsewhere. (...)'

'28 December 2006, 1130 h  
(...) Storm warning.  
Developing low 968 hPa  
At 43N 152E See east of Japan moving eastnortheast 20 knots.  
Occluded front from 45N 154E to 43N 160E 39N 163E.

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<sup>8</sup> Times were converted from UTC to the time on board the CAP EGMONT.

Warm front from 39N 163E to 35N 164E 31N 164E.  
Cold front from 39N 163E to 35N 162E 30N 158E 27N 155E 25N 151E.  
Winds 30 to 60 knots within 1200 miles of low.<sup>9</sup> (...)

These gale warnings referred to a storm centre east of the island of Hokkaidō. At 30 to 60 knots, the Japanese meteorological service estimated the expected wind speeds for the sea area east of Japan to be higher than those calculated by the weather forecast software. A wind speed of 30 knots corresponds to a near gale, while 60 knots already represent a violent, hurricane-strength storm.

#### **5.2.6.5 Official expertise of Germany's National Meteorological Service**

Upon request from the BSU, the Maritime Shipping Department of Germany's National Meteorological Service (DWD) examined the wind and sea conditions in the sea area at and around the ship's position at the time of the accident on 28 December 2006.

The expertise is based on the measurement and observation values of land, coastal and island stations, oceanographic buoys and travelling ships, available through the international exchange of weather data. The sea condition plots produced by the European Centre for Medium Range Weather Forecasts (ECMWF) were taken into account in the evaluation of the sea conditions in addition to the wind, sea and swell information reported by other vessels sailing in the area. Moreover, satellite images published by the satellite station of the University of Dundee in Great Britain were also used in developing the expert opinion.

As well as the evaluation of the data available for the area to be assessed as described above, a scientific analysis of the general weather situation and its development was also carried out; it constitutes an essential foundation of the expert opinion.

According to the analysis, on 26 December 2006 a low pressure disturbance formed over the East China Sea, reaching hurricane strength over the Japanese island of Hondo on the day preceding the accident and then moving further northeast. On the morning of the day of the accident a secondary low had formed over the Sea of Japan, slowly weakening the windstorm.

According to the report, the wind and sea conditions were as follows at the scene of the accident on 28 December 2006 at around 1500 h:

The wind was southwesterly, at an average strength of 5 to 6 Bft, which after freshening up might have reached up to 6 to 7 Bft around 1600 h. The sea state in the accident area at this time is assumed to have reached significant wave heights of about 5 m at 11 second intervals. In this regard the sea state has been developed from the wind sea with waves of 3 m of significant height (7 second intervals) and the swell of 4 m significant wave height (rolling from the west, 12 second intervals).

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<sup>9</sup> In the original message the sentence ends here.



As the DWD's conclusions conflict with part of the CAP EGMONT crew's descriptions regarding the wind force prior to the accident, the sea state in the area of the accident was second-guessed supplementary, based on only 3 to 4 Bft. In this regard the DWD's calculations lead to a sea state of 4.3 m significant wave height. Additionally DWD disclosed that in prevailing wind conditions of 3 to 4 Bft individual waves reach heights up to 8.5 m at regular intervals. As to the quality of the available weather information from the day of the accident, DWD adheres to its valuation, whereas on the day of the accident the wind was at an average strength of about 6 Bft, causing a sea state of 5 m height. Given that kind of wind and sea state conditions, it is considered assumable for every 100<sup>th</sup> wave to exceed a wave height of 7.5 m. This is said to occur approx. every 16 minutes. Individual waves up to 10 m high are considered to be possible. So-called 'outsize waves' were not considered in the DWD's expertise.

Furthermore the DWD informed upon the BSU's request that on the day of the accident significantly minor wind forces occurred on the original southernly route.

### **5.2.7 Manoeuvre log and ECDIS records**

The CAP EGMONT's manoeuvre log printer records for the time between 10:32:58 h and 20:51:44 h were evaluated for the marine casualty investigation.

The information regarding the revolution speed stated in the engine records has been verified with ECDIS' recorded course and speed information. From these records it becomes apparent that on the day of the accident the CAP EGMONT was sailing 'full ahead sea', whereas the propeller's effective revolution frequency always undercut the maximum revolution speed of 108 rpm.

After the Master had returned from the forecastle to the wheel house at about 1600 h, the revolution speed of the main engine was reduced by order from 101 rpm to 96 rpm. This lead to a decrease of the ship's speed from 15 knots to 13.8 knots until 1620 h (cf. fig. 12 to 14).

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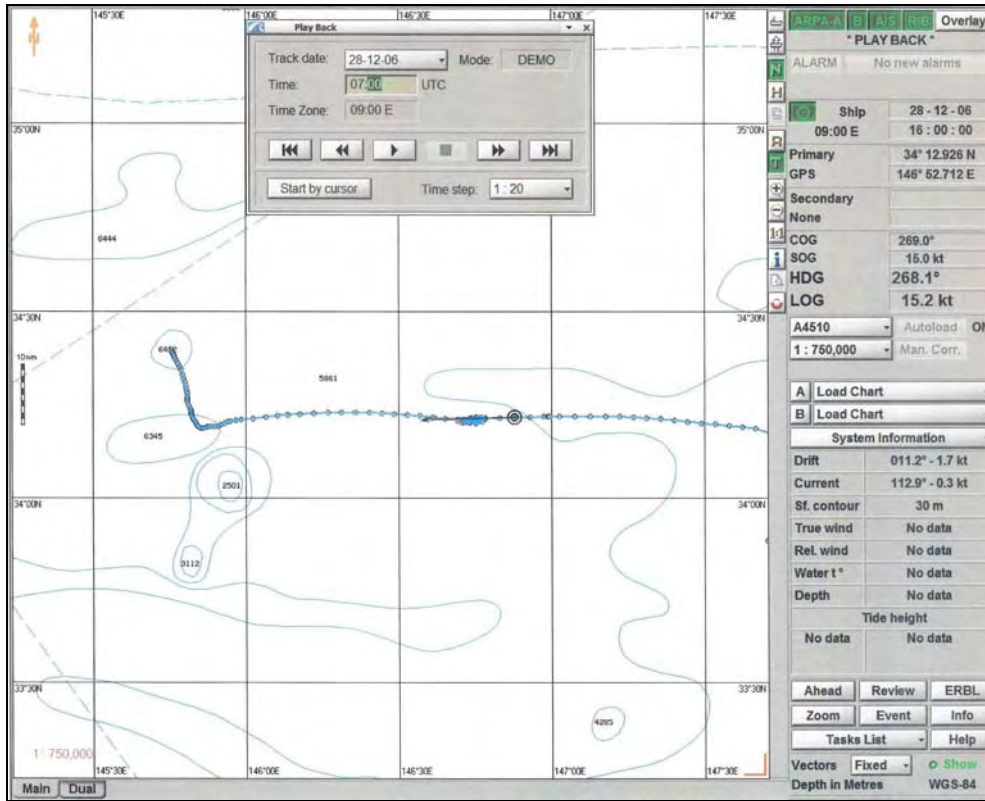


Figure 12: ECDIS-record of 1600 h

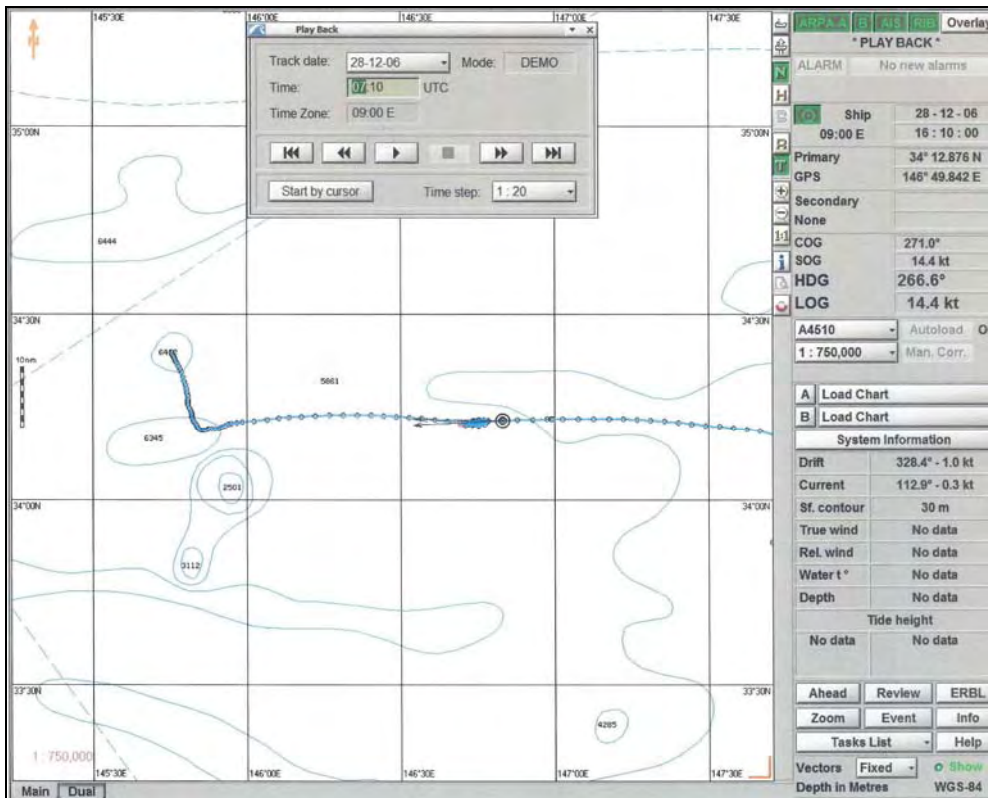


Figure 13: ECDIS-record of 1610 h

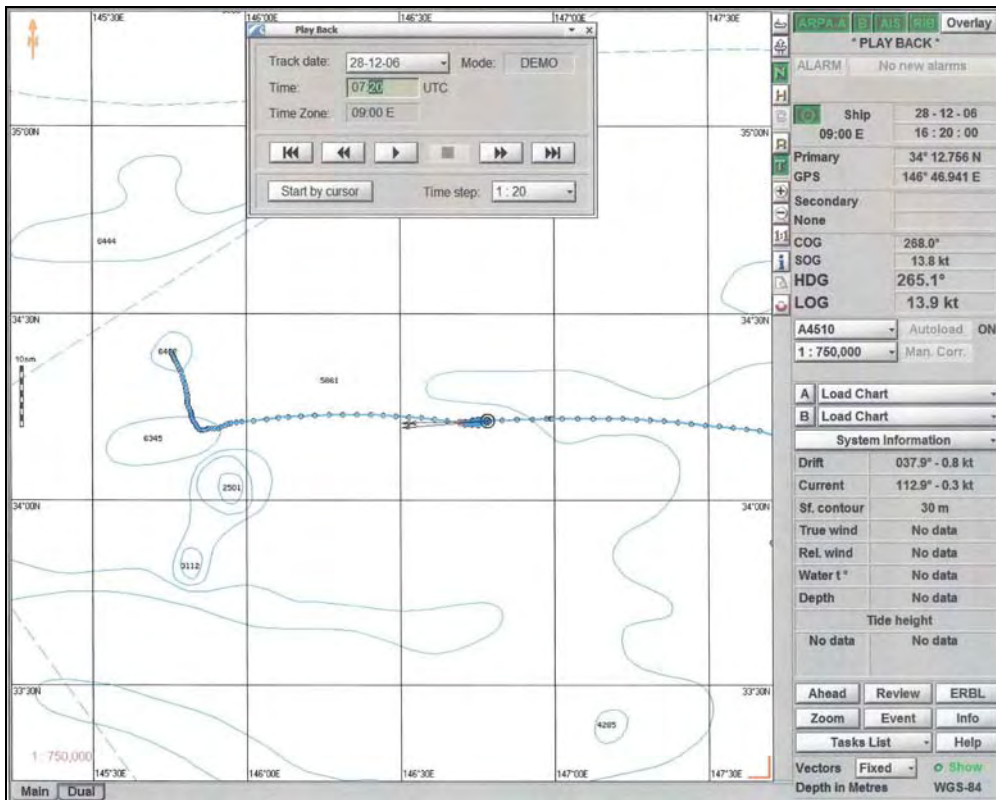


Figure 14: ECDIS-record of 1620 h

According to the manoeuvre log the ship's speed had been reduced from 'full ahead sea' to 'dead slow ahead' at 1630 h. This rate of speed had been maintained until 2051 h.

### 5.2.8 Evaluation of witness reports

On the day of the accident, and for understandable reasons, the CAP EGMONT's command ordered certain work to be carried out on the forecastle. In view of the significant amount of sea water that had entered the bosun store and the rope locker below through the damaged hatch (cf. fig. 4), the decision to pump out the flooded areas was a logical one. The installation of the mobile pump and the pump-out work itself took place mostly below deck, so that the greater part of the engine personnel assigned to this duty was not directly exposed to the rough weather conditions.

The ship's command's order to tighten the anchor lashings and to repair the anchor securing chain is also understandable. In view of the remaining distance still to be sailed on the high seas by the CAP EGMONT on the day of the accident, the BSU does not question the decisions made in order to ensure the highest possible safety.

Although in the morning of 28 December 2006 the Master is said once again to have pointed out the need for wearing personal protective equipment, it is indisputable that in the afternoon and despite the temporary presence of the Master and of the

C/O on the forecandle the crew did not wear the protective gear to the extent required.

The various witness reports partly describe the weather conditions prevailing prior to the accident as being milder than indicated by the meteorological forecasts and the DWD's official weather expertise. The BSU seriously doubts that estimations of a prevailing gentle to moderate breeze (3 to 4 Bft) could be considered as realistic.

According to the DWD's official expertise, wave heights in the incident area reached 5 m. This estimate is supported by the entries made in the CAP EGMONT's bridge log by the officer on watch ('Sea-scale: 6'). According to the Petersen Beaufort scale, a sea disturbance of 6 indicates very rough seas with – according to knowledge currently available – wave heights of between 3.5 and 6 m. In view of the CAP EGMONT's freeboard, which was of between 6 and 7 m, the swell of approx. 4 m, and the interaction between wind sea and swell rolling nearly unidirectional it can be assumed that at the time of the accident the prevailing significant wave heights easily could have reached 5 m.

The predictions developed by the ship owner's weather forecast service for the day of the accident (wind speeds of 25 to 40 knots) ultimately match the occurred wind conditions. The charterer's weather information service had not yet specified conditions to be expected on the day of the accident in its telex of 24 December 2006. As the telex did contain the general confirmation whereby similar conditions were to be expected along all routes, CAP EGMONT's route deviation is held arguable given the weather information present at that time. After all the wind forecast provided by the owner's weather information service did not per se constitute a scenario threatening to ship and crew.

According to the forecast of both weather services used on board as well as the DWD's subsequent reflections, the low pressure disturbance developed not till 26 December 2006. At that time the ship's command's choice for the shorter northerly route already dated back two days.

### **5.2.9 Forensic opinion**

After the CAP EGMONT had come into port at Yokohama/Japan, the International Clinic issued a Certificate of Death for the fatally injured O/S. On the certificate, the cause of death is given as being traumatic shock, caused by a skull fracture, a cerebral contusion and an open wound on the back. Survival time was estimated to have been short. This document notes that no operation or autopsy were carried out, and that death was due to accidental external injury.

The rescue measures concerning the fatally injured O/S as well as his externally ascertainable injuries were documented by means of photographs taken on the CAP EGMONT on the day of the accident. The BSU presented these photographs to the Forensic Institute of the Hamburg-Eppendorf University Clinic for further evaluation. The director of the Institute, Prof. Püschel, MD, a highly experienced expert well-versed in fatal marine accidents, analysed the photographic documentation from a forensic point of view.

According to his report, the accident led to significant loss of blood, particularly in the area of the cranial injury. Overall, the visible injuries were described as multiple trauma resulting from massive violent trauma to various areas of the body as a result of contact with blunt and also semi-sharp objects.

In closing, Prof. Püschel draws the following conclusions, reproduced below verbatim:

Wearing a hard hat would certainly have prevented the head injury that occurred in this case, and more particularly the extensive scalping.

The gross injury on the back could presumably also have been prevented by wearing a robust protective vest.

Altogether, these measures would probably have prevented the extremely extensive blood loss, and the seafarer's survival chances would have been significantly greater. A conclusive assessment in this regard is however not possible because the full extent of the internal injuries (to the brain and meninges, in the chest and abdominal areas) can only be speculated about since no autopsy was performed.

The injuries shown on the photographs were all critical. The prognosis / chances of survival on a ship on the high seas were unfavourable from the very beginning.

#### **5.2.10 Summary and conclusions**

The evaluation of the documents and of the information obtained within the scope of the casualty investigation leads to the following observations:

The modified route followed by the CAP EGMONT on the crossing from the west coast of Central America to the east coast of Japan ran more northerly than the original itinerary. The route actually sailed thus brought the CAP EGMONT closer to the low-pressure system. However, for the CAP EGMONT's command the wind and especially the sea state conditions posing a threat became apparent on 26 December 2006 at the earliest. At that time the CAP EGMONT was already sailing the new route for two days.

Given the dimension of the sea area affected by the gale as stated amongst others in the warnings of the Japanese meteorological service, circumnavigating the strong breeze area could not be considered as promising for the CAP EGMONT.

It can be assumed that weather conditions had in any event slightly improved towards the afternoon of 28 December 2006. However, at around 1600 h the sea was still rough as a result of winds of around 6 and 7 Bft and the superimposition of wind sea and swell. Because of the safety procedures implemented on board, the crew members were fundamentally aware of the fact that they were supposed to adapt the wearing of personal protective equipment for work to be carried out on deck to the prevailing weather conditions. Nevertheless, in the afternoon, on the forecastle and in spite of the presence of the Safety Officer and the Master they wore neither hard hats nor life vests. On the day of the accident, there were only very few, locally limited options available for the crew to hitch safety lines.

According to excerpts from the manoeuvre log and the ECDIS-records, the ship's average speed of 15 knots had already been reduced by nearly 1.5 knots before the accident.

From a forensic point of view it can be ascertained that appropriate wearing of a hard hat would likely have prevented the extensive head injuries suffered by the O/S. In view of the number and severity of his injuries (multiple trauma), however, even the wearing of a hard hat would in retrospect not allow for a more favourable survival prognosis.

The fall overboard of the A/B could have been prevented if a life belt had been worn and the safety line had been attached in the proximity of the anchor windlasses. The seafarer's survival would not have been compellingly assured by doing so, as is demonstrated by the significant injury pattern sustained by the fatally injured O/S. As the missing seaman could not be found, the cause of his death remains ultimately unknown. However, wearing a life vest would nonetheless in principle have improved his chances of survival.

## 6 Analysis

The causes for the accident on board the CAP EGMONT can primarily be ascribed to heavy weather in the sea area off the east coast of Japan. Following evaluation of all available information, in the opinion of the BSU it is clear that none of the possible precautions could have prevented the accident and its serious consequences with certainty. It is nonetheless in the nature of an ex-post-facto analysis that individual measures taken are critically examined within the scope of an overall assessment of the circumstances. From this examination the BSU has derived observations and optimisation possibilities that are more closely described below.

### 6.1 Vessel's routeing

In its Chapter V, the International Convention for the Safety of Life at Sea (SOLAS) sets out binding rules for maritime safety. Rule 34 of SOLAS Chapter V addresses safe navigation and the avoidance of dangerous situations, and requires a ship's Master to plan his itinerary in a scrupulous and diligent manner. Pursuant to Clause 2.3 of this rule, routes should be identified in a manner such that all known navigational hazards and adverse weather conditions are anticipated.

When the choice for a route deviation was made on board the CAP EGMONT on 24 December 2006, all weather information available did indeed point out at wind forces between 25 and 40 knots to be expected. But this data was not yet to be categorized as posing a threat. In its assessment of the weather conditions, the ship's command was supported by the two weather forecast services available on board, one of which acknowledging similar conditions to be expected along all routes. CAP EGMONT's command is not answerable to the fact that the forecast did indeed not match with the weather conditions which occurred four days later.

No indications could be asserted whereby the charterer's weather information service could have misinterpreted the weather data available. Forecast provided four days in advance might comprise uncertainties.

At the time when the low-pressure system emerged with its possible impacts on wind and sea state conditions on 26 December 2006 for the days to follow, it was too late to circumnavigate the gale area. All in all CAP EGMONT's routeing is therefore not considered objectionable.

### 6.2 Necessity of the work carried out on deck

The wave impact damage found on the forecastle of the CAP EGMONT over the course of day of the accident was not insignificant. It therefore caused the Master to order measures to remedy the damage to the extent that it jeopardised the ship's

safety. This involved on the one hand pumping out the flooded store rooms below the hatch and on the other consistent tightening of the lashings on the two anchors. In the opinion of the BSU it was of special importance in particular in view of the remaining distance to the nearest coast to maintain the safety of the vessel and therefore also ensure that of the crew and cargo. The measures taken by the Master were ordered within this context.

### **6.3 Measures 'to weather'**

Heavy weather techniques as 'to weather' in the sense of taking measures to avert danger is a component of the rules of good seamanship. It enables the ship's command to act in a particularly responsible way while taking into account standard seamanlike practice.

Both the CAP EGMONT's command and also the ship's owner were aware of the precautionary measures to be taken in heavy weather to improve the safety of sailors working in unprotected deck areas. The speed had been reduced and that the course had been adjusted to port twice so that the ship would not have to encounter the waves directly. It was necessary for the owner to urge its assigned Masters by means of a circular letter to reduce speed when crew members are to be working on deck in heavy weather conditions and to adjust their vessel's course (cf. below under item 7).

However, the manoeuvre log printouts as well as the ECDIS-records for the CAP EGMONT show a speed reduction from 1605 h on. Until that time the vessel had continued to proceed at a speed of approximately 15 knots. It could not be conclusively presumed whether the decrease in ship's speed of about 1.5 knots complies with the seamanlike principle 'to weather'. For the prevailing weather and sea state conditions on the day of the accident in the accident area are subject to retrospective consideration only by approximation. Additionally, it could not be resolved whether the three strong waves washing over the CAP EGMONT's forecastle were to be classified as individual waves occurring regularly or as unpredictable outsize waves. It could not be conclusively presumed to what extent individual waves had better be encountered with further reduced speed, as to the complexity of the criteria to be taken into account (e.g. ship's dimensions, draft and trim, wind's direction and force, wind sea, swell).

### **6.4 Safety measures taken**

The Master had obtained a personal impression of the damage that had occurred by means of an inspection of the forecastle. This also enabled him to assess the prevailing weather conditions and to order the appropriate safety measures to be taken. On the basis of the weather forecast it was foreseeable that the CAP EGMONT would meet with heavy weather on the edge of the expected low-pressure system. Therefore, stretching safety wires to allow safety lines to be hitched would already have been advantageous even for the regular safety inspection rounds to be performed on deck. With its few existing lugs, the bow area of the CAP EGMONT did



not provide the crew with adequate options for safeguarding against falling overboard by means of hitching a safety line attached to a safety belt.

As the work that had been ordered was to be performed on the unprotected forecastle, wearing full personal protective equipment was in fact of essential importance. Pursuant to § 5a Sec. 4 of the UVV-See, every shipping enterprise must order and monitor the use of personal protective equipment. In this context, the Master acts as a representative of the owner and is therefore responsible for use of the protective equipment in accordance with regulations.

According to reports received, the crew members who later suffered injuries or died had, on the occasion of the first safety inspection round in the early morning hours of 28 December 2006, gone on deck wearing their full safety equipment. The instruction to wear the equipment is said to have been issued again after their return to the accommodation block.

The fact however is that at the time of the accident both the members of the deck crew and also those of the engine crew assigned to the forecastle had only inadequately responded to the requirement to wear protective equipment. This circumstance ultimately contributed to the O/S of the deck crew sustaining critical head injuries, and the A/B being swept overboard as a result of not being secured by means of a safety line. Even if, as already discussed in detail, proper wearing of safety helmets and hitching the safety line attached to the safety belt might not compellingly have guaranteed the survival of the two ultimately deceased seamen, their chances of survival would nonetheless have been improved. To this extent it is difficult to understand that despite the presence of the Master and of the C/O in his capacity as Safety Officer on the forecastle no umbrage was taken to the insufficient safety measures. This is particularly poignant against the background of the statements maintaining that the Master had, on the very morning of the day of the accident, pointed out the necessity to wear protective equipment. Although after the fact all those involved indicated that they had estimated the weather conditions as not being critical, on the basis of the available weather information the BSU considers it justifiable to assume the weather conditions to have been by all means consistent with a strong breeze to near gale situation and rough sea.

According to the BSU's opinion, in view of the weather and sea conditions and their expected deterioration it was essential that the necessary work on the forecastle be carried out only under optimum crew protection circumstances. Because of the danger of striking against equipment in the work area around the anchor windlasses, head protection was essential. The requirement of properly putting on the protective equipment, in particular the chin straps of hard hats, had already been pointed out by the BSU in its report concerning the fatal maritime casualty event on the M/V AUTO ATLAS (Ref. 350/03). The report concerning the serious personal injury accident on the M/V MAIKE (Ref. 638/06) also focused on a hard hat that had not been worn in due form.

Independently thereof it was necessary to safeguard the crew from the dangers of falling overboard. This applies in particular against the background that it was not 'weathered' prior to starting the afternoon work on the forecastle to the extent described by some of the crew members.

In regard to the above conclusions concerning personal protective equipment it must be noted that, last but not least, the victims themselves were in fact responsible for using the proper personal protective equipment adapted to the weather situation. In § 19 Sec. 1 of the UVV-See parties insured with the See-BG are explicitly committed to follow instructions for the use of personal protective equipment. Even if the Master had not repeated the instruction to wear safety gear in the morning of the day of the accident, it can be assumed that the crew assigned to the forecastle was fully aware of the general requirement to wear protective equipment in heavy weather. This applies both to the deceased as well as to the injured seamen.

In summary it can be concluded that a weather related accident occurred due to several waves coming over the stem of the CAP EGMONT, resulting in serious consequences for the affected crew members. Not all possible measures to avert weather and sea conditions related hazards were taken in preparation of the work required to be carried out on the forecastle. This is the case both for the ship's command and for the responsible officers as well as for the deceased and injured seamen themselves.

## 7 Actions taken

The owner of the CAP EGMONT has, of its own accord, implemented certain measures after the accident to improve safety on board and help prevent future accidents.

According to information received from the shipping company, in future a new model of hard hat will be made available for work on deck. The safety helmets are intended to be used on all vessels of the owner. They shall provide increased wearing comfort, which should generally help increase acceptance of the helmets on board.

Use of remodeled helmets as head protection gear on board maritime vessels mandatorily assumes, among other standards, a CE marking according to the ordinance regarding the circulation of personal protective equipment (8<sup>th</sup> GPSGV<sup>10</sup>; cf. implementation regulations of the See-BG for § 5 section 2 of the UVV-See)<sup>11</sup>.

By means of a CE marking, a manufacturer of personal protection equipment confirms that the safety requirements of the 8<sup>th</sup> GPSGV are met, and also that the protective gear is subject to an EC type approval and an EC quality assurance procedure and that it complies with these standards (cf. § 3 Sec. 1 No. 1 of the 8th GPSGV). Variations of the requirements of the UVV-See are however possible if they are permitted by the See-BG in accordance with § 4 of the UVV-See.

As a further action taken after the accident, an additional rail is to be installed on board the CAP EGMONT in both the bow and the aft section of the ship; according to information received from the owner this has already been done for the stern area and for portions of the bow section (cf. fig. 15).

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<sup>10</sup> 8<sup>th</sup> Ordinance concerning the Equipment and Product Safety Act (Geräte- und Produktsicherheitsgesetz) as promulgated on 20 Feb. 1997 (German Federal Law Gazette I p. 316) and amended by art. 15 of the Act of 6 Jan. 2004 (Fed. Law Gaz. I p. 2); implementation of Council Directive 89/686/EEC of 21 Dec. 1989 concerning harmonisation of the legal provisions of Member States in relation to Personal Protective Equipment.

<sup>11</sup> An excerpt of the implementation regulations of the See-BG for § 5 sec. 2 of the UVV-See (Provision of Personal Protective Equipment) reads as follows:

‘This regulation provides for the use of personal protective equipment for which declarations of EC conformity have been provided by the manufacturers (...) and for which the CE marking within the meaning of 8. GSGV § 5 has been obtained.’



Figure 15: Additional rail installed on board the CAP EGMONT

The additional railing is intended to enable crew working on deck to hitch their safety lines.

In addition, the owner drafted a circular letter on the subject of “Personal Safety Equipment”, delivered to its assigned Masters; the circular summarises the circumstances surrounding the accident on board the CAP EGMONT. It urges the Masters to exercise greatest possible caution in connection with work carried out on deck. The circular explicitly stipulates the following measures:

- Safety briefing before entering the open deck
- Adjustment of vessel’s speed and course
- Check on the equipment of each crew member prior to leaving the accommodation (inflatable able life vest, hard hat, safety belt, foil covered walky talky)
- Appointment of task groups
- Order for self-securing with safety belts
- Stretching safety wires in order to hook in the life line of the safety belt to prevent from being washed overboard
- Establishment of a permanent communication between the wheelhouse and the crewmembers.

The attachment to the circular letter includes large format illustrations of a complete set of personal protection equipment (cf. fig. 8).

The ship's owner intends to issue a separate circular letter on the subject of weather and sea state conditions.

Furthermore, the forecastle hatch that had been damaged before the accident had been repaired in the meantime and reinforced against wave impacts (cf. fig. 16).



Figure 16: Repaired and reinforced hatch coaming on the forecastle of the CAP EGMONT

On the basis of the actions already taken by the owner even before completion of the BSU's marine casualty investigation there is no further need to issue safety recommendations concerning precisely those measures.

## 8 Safety recommendations

The following safety recommendations shall not create a presumption of blame or liability, neither by form, number nor order.

The Federal Bureau of Maritime Casualty Investigation recommends **ship's commands** to consider while assessing the sea state in preparation for work to be carried out on deck that individual waves might at all times exceed the significant wave height substantially.

They are further recommended to assure the appropriate use of protective equipment by every individual seaman to be verified before any work is performed on deck.

## 9 Sources

- Witness statements and correspondence:
  - Hammonia Shipping Company
  - Master, C/O, Second Officer, Third Officer, Chief Engineer, Second Engineer, two seamen, Wiper of the CAP EGMONT
- Crew list
- Minimum Safe Manning Certificate
- Extracts from the bridge log
- Extracts from the manoeuvre log
- ECDIS-records
- Speed table
- Stability and freight documentation
- General arrangement plan
- Vessel photo from the Hammonia Shipping Company
- Report and photographic documentation of the GL surveyor
- Printouts of weather charts produced by two separate weather information services
- Copies of e-mail and telex messages exchanged between ship's command and weather information service
- Copies of storm warnings from the Japanese meteorological service
- Official weather report of the DWD
- Medical examination reports for the two injured seamen
- Photographic documentation of the first aid measures and of the injuries of the fatally injured seaman
- Death certificate for the fatally injured seaman
- Forensic report issued by the UKE
- Interim Sailing Permit
- Cargo Ship Safety Equipment Certificate
- Accident report of MRCC Bremen
- Accident report of the Maritime Emergencies Reporting and Assessment Centre of the Central Command for Maritime Emergencies, Cuxhaven
- Accident report of the Japanese Coast Guard
- British Admiralty chart BA 4510