Bundesstelle für Seeunfalluntersuchung
Federal Bureau of Maritime Casualty Investigation
Bundesoberbehörde im Geschäftsbereich des Bundesministeriums
für Verkehr, Bau- und Wohnungswesen

Investigation Report 145/04

Very serious marine casualty

Loss over board of the Skipper of SY ALENA on 20 June 2004, southwest of Gedser

1 February 2005

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 24 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.

As to the interpretation of this investigation report, the German version is prevailing.

issued by:
Bundesstelle für Seeunfalluntersuchung
Federal Bureau of Maritime Casualty Investigation (BSU)
Bernhard-Nocht-Str. 78
D-20359 Hamburg

Director: Dieter Graf
Tel.: +49 40 31908300, Fax.: +49 40 31908340
posteingang-bsu@bsh.de www.bsu-bund.de

Table of Contents

List of Figures

1 Summary of the marine casualty

During the voyage of SY ALENA from Kiel to Gedser, Denmark, the 64-year-old skipper fell over board approx. 9 nm SW of Gedser on 20 June 2004 while taking in the main sail under southwesterly winds of force 3-4 Bft. with a characteristic wave height of 0.5 m,. Rescue attempts by his wife sailing with him were unsuccessful. Following an emergency call that was heard from two Swedish vessels at 22.15 h and forwarded to the MRCC Bremen, the SY ALENA was found by a BGS (German Federal Border Guard) vessel at 23:49 h. The yacht was taken to Gedser escorted by a BGS boat, where the wife was passed on to a hospital in Nykøbing with medical assistance. The search with three BGS vessels, two Danish and German emergency rescue cruisers, two helicopters of the BGS and the German Navy, two helicopters of the Danish Navy, a vessel of the Danish Navy and two Danish survey vessels remained unsuccessful and was discontinued the next morning. On 4 August 2004 the corpse of the skipper was found at Bagenkop, southwest of Langeland.

2 Scene of the accident

Nature of the incident:	Very serious marine casualty, loss over board
Date/Time:	20 June 2004, 22:15 h
Location:	Southwest of Gedser, Denmark
Latitude/Longitude:	φ 54°27,0' N λ 011°47,0' E

Section from sea chart 3005 Sheet 10, 2003 Edition, BSH

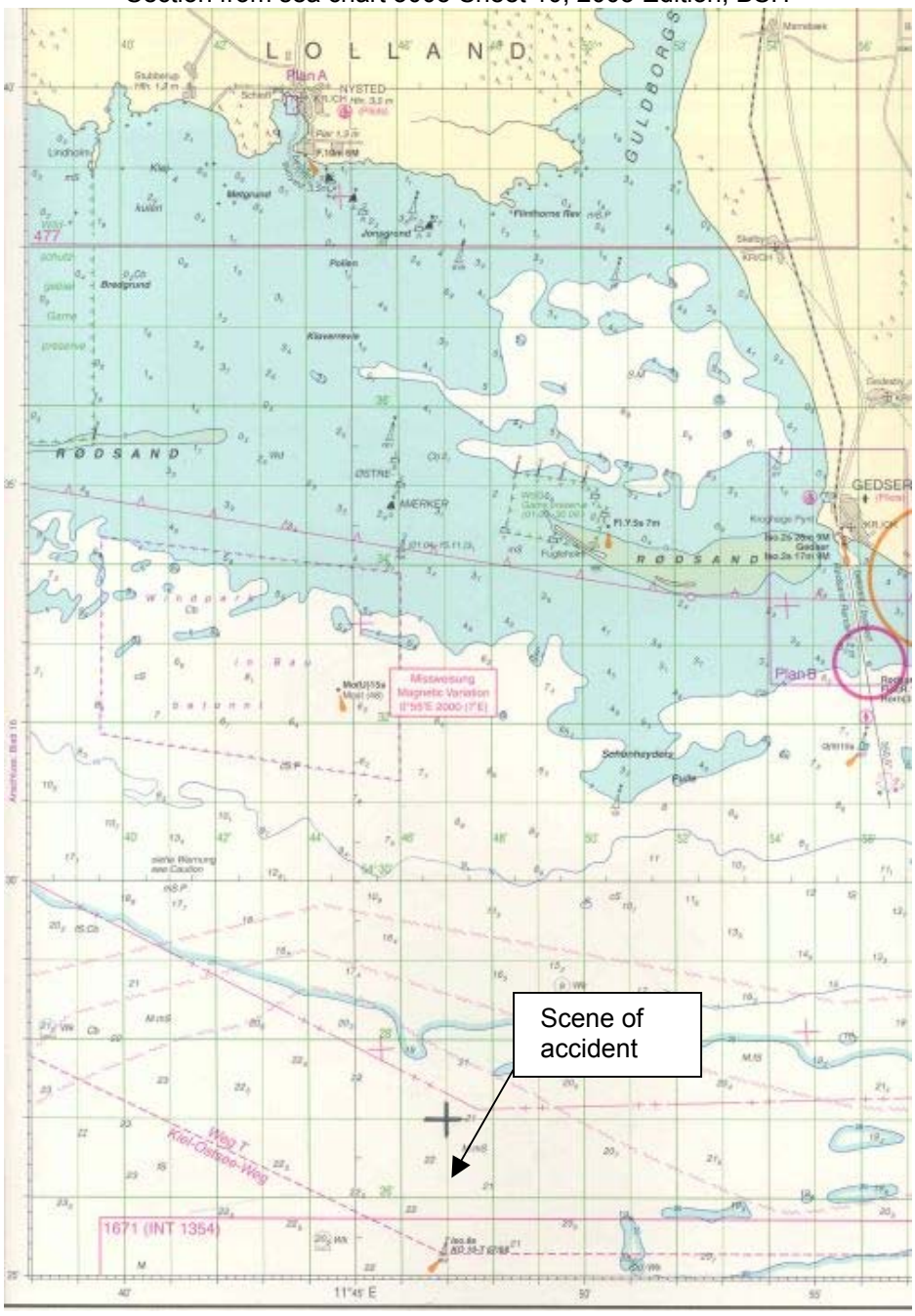

Figure 1: Sea chart with scene of the accident

3 Vessel particulars

3.1 Photo

Figure 2: Photo of vessel

3.2 Data

Name of vessel:	ALENA
Type of vessel:	Leisure craft, Wibo 930
Nationality/Flag:	Federal Republic of Germany
Port of registry:	Hamburg
Call sign:	DD9020
Burgee certificate:	DSV Nr. 251
Year built:	1981
Building yard/Hull No.:	Woubrugse Jachtwerf G. van Wijk&Zoon Netherlands
Length over all	9.30 m
Width over all:	2.98 m
Displacement:	5 t
Sails:	Roller genoa 26 m², main sail 16 m²
Draught:	1,50 m
Engine rating:	25 hp
Main engine:	Bukh Diesel
Speed:	8 kn
Hull material:	Steel
Number of crew:	2

4 Course of the accident

At 22.15 h on 20 June 2004 the Swedish vessels GOETALAND and FIN AERO that were proceeding along the Lübeck-Gedser Way in the sea area of the Baltic Sea off Buoy "TN 4" heard a call for help by a woman. At about 22.20 h MRCC Bremen notified the Baltic Sea Coast Guard Centre (KüWaZ) that a call for help from a woman over VHF marine radio had been heard by several vessels in the sea area of the Baltic Sea at Buoy "TN 4" on the Lübeck-Gedser Way. Contact with the woman did not materialise. The BGS operation vessel BG 23 thereupon immediately made for the sea area.

At 22.50 h the Baltic Sea Coast Guard Centre informed the BGS operation vessels BG 23, BG 26 and BG 21 that a man on the sailboat ALENA had fallen over board without a lifejacket in the sea area south of Gedser while taking in the sails, and had been missed since then by his wife. After telephone notification by the son-in-law of the woman calling for help to the Assignment Centre Harburg, the MRCC Bremen notified the Baltic Sea Coast Guard Centre at about 22.45 h that the woman on board the sailboat ALENA believed she could see the beacon or the Gedser Buoy and was currently moving round in circles in the sea area.

At 23.49 h on 20 June 2004 the German sailing yacht ALENA was found at position 54°27,0‘N 011°47,0‘E (outside German coastal waters) by the BGS operation vessel BG 23. The yacht was drifting at the above position with the jib hauled in and the main sail pulled down, with the engine running but not engaged. There was a woman alone in the starboard cockpit of the yacht who stated that she and her husband had been on a passage from Kiel, Marina Wendtorf, to Gedser in Denmark. Her husband had fallen backwards over board while recovering the main sail, (see Fig. 3) and had tried to swim towards the yacht. She - who was visibly under shock - had tried to move the yacht towards her husband. During the run she had seen him drifting in the water until she lost sight of him.

On 21 June 2004 during the period 00.15 h to 05.30 h the SY ALENA escorted by the control boat of BG 23 was taken to the port of Gedser, and in view of her condition the woman was handed over to the hospital in Nykøbing for medical assistance.

The search for the missing man was continued at 00.23 h on 21 June 2004 in three search areas determined by the Naval District Bornholm with the following forces at sea:

- BG 23 "Bad Düben"
- BG 21 "Bredstedt"
- BG 26 "Eschwege"
- D Emergency Rescue Cruiser "Theo Fischer"
- -1- BGS police helicopter
- -1- German SAR naval helicopter
- DK Emergency Rescue Cruiser "L.W. Dam"

- DK naval vessel "Varel"
- DK survey vessel " SKA 15"
- DK survey vessel "SKA 16"
- -2- DK naval helicopters

At the instruction of Naval District Bornholm the search for the missing man was broken off without results at about 09.40 h on 21 June 2004.

The Coast Guard Centre Baltic Sea was notified via MRCC Bremen by the Danish authorities at about 19.35 h on 4 August 2004 that a corpse had been recovered from the water at Bagenkop, island of Langeland, in Denmark. The corpse could perhaps be the missing man from the marine casualty SY ALENA of 20 June 2004.

In consultation with the German Federal Criminal Police Office (BKA), OA 37, on 5 August 2004, it was confirmed that the Danish authorities had found a corpse at about 15.00 h on 4 August 2004 near Bagenkop, island of Langeland in Denmark, and it was requested that documents for identification of the missing man be sent to the responsible department in the German Federal Criminal Police Office. Two photos of the missing man and the identification documents without the dental diagram were then sent by e-mail to the German Federal Criminal Police Office at about 15.40 h on 5 August 2004.

In consultation with the Danish police in Svendborg at about 16.15 h on 5 August 2004 it was confirmed that a water corpse had been recovered at Bagenkop, island of Langeland, who had a paper with him, from which it was evident that the corpse might be the missing man. A request was made for the identification documents to be sent for clear identification.

The Danish police in Svendborg had an autopsy and post-mortem examination conducted by the official physician at about 08.30 h on 6 August 2004 in the Forensic Medical Institute in Odense in order to identify the corpse found.

On the basis of the identification documents handed over, agreement of the garments and some conspicuous anatomical features was ascertained during the first autopsy. However, the identification could only be made definitely by a Danish dentist on 11 August 2004 after the dental diagram and the X-rays of the dentures had been sent over. As a result of the post-mortem examination the corpse found near Bagenkop on the island of Langeland in Denmark on 4 August 2004 was identified beyond doubt as the missing man. The cause of death could not be ascertained with absolute certainty. According to the analysis of the findings, it must be assumed that this was a case of death by drowning. The outer-wear consisted of a troyer sweater and a fleece jacket.

As a result of the investigations it is clear that the married couple were on a three-month sailing tour of the Baltic Sea and that they had been on a crossing from Kiel, Marina Wendtorf, to Stralsund (port of destination) via Gedser in Denmark since 08.30 h on 20 June 2004. At the time the SY was found, the sails were down and the engine was running but was not engaged.

5 Investigation

On 21 July 2004 the BSU together with the BGS conducted a survey on board ALENA and held a hearing with the wife of the missing man.

The wife stated that the two had many years of joint sailing experience. Between 1975 and 1980 they both sailed with a cruising centre-boarder (Jollenkreuzer), chiefly on the River Elbe. In 1979 the couple bought the ALENA as a hull and completed it on their own. The boat is equipped with a rig from Messrs. Reckmann. It has a main sail with an area of 16 m², a roller genoa with an area of 26 m², a roller jib with an area of 18 m², a storm jib and a blister. In 1999 the engine was replaced by a 25 hp strong Bukh-Diesel.

The wife holds a Sportbootführerschein (Leisure Craft Certificate), dating from 1979, and the "short range certificate" (Operating Certificate for Radio Operators with restricted validity II) dating from 1998. The husband held a Sportbootführerschein (Leisure Craft Certificate) dating from 1980 and a "short range certificate" (Operating Certificate for Radio Operators with limited validity II), dating from 1998.

The navigation and radio equipment consisted of a GPS receiver Navman Tracker 500, a magnetic compass midships on a fixed stand in the cockpit, a Seafarer 501 echosounder, a Navman log system and a VHF radio set DEBEG 6310, as well as a world receiver. All the equipment was in working order. Waypoints were entered in the GPS receiver that were subsequently evaluated by the BGS (see Fig. 5).

The safety equipment consisted of a lifejacket with bracket (see Fig. 6), two further solid lifejackets, an inflatable boat (see Fig. 7), two self-triggering working jackets with replacement cartridges (see Fig. 8) and a NICO distress signal unit with ammunition (see Fig. 9). The working jackets of type Secumar BS8 showed a maintenance date of July 1981. The couple had not put on any working or lifejackets during the sailing tour and were not secured with the lifebelt. The inflatable boat was secured aft ready for operation in inflated condition (see Fig. 12).

Among the material on board was a set of German leisure craft charts from Nautische Veröffentlichungen Verlagsgesellschaft mbH Arnis 1999, a yacht radio manual Yachtfunkdienst BSH 1993, a Coastal Almanac 2002, a marine radio manual Handbuch Seefunk 4th edition, a yacht pilot book Yachtpilot DSV 2002, a port manual for the Baltic Sea Hafenhandbuch Ostsee Band 1B 1993, and sundry technical books such as "Das Segelhandbuch" (sailing manual) and a weather board. No logbook was kept.

On the day of the accident the husband was skippering the boat. According to the information supplied by his wife, he determined the command on all voyages. However, the wife was familiar with the operation of the vessel. She recorded the weather report twice a day prior to starting a sea voyage, normally via Deutschlandfunk 1269 kHz, on a wiping weather board and also carried out the casting off and berthing manoeuvres throughout the entire voyage period, while her husband was responsible for handling the mooring lines. The wife entered the last

weather report on 19 June 2004 (see Fig. 10). At the time of the accident sea chart S 15 (see Fig. 11) was being used. No courses were entered. According to the information supplied by the wife, a practical "Person[1] over board" manoeuvre had never been practiced.

With regard to the possible course of the accident the witness stated that her husband went to the mast foot on the starboard side to haul in the main sail and was working at the mast there. The main sail was then lying pulled down on the cabin superstructure. SY ALENA was running under engine power in the direction of the port of Gedser. She saw the wind farm installation and the Gedser light beacon ahead on the port side. At the time her husband went over board she had only seen from her position at the tiller that he fell backwards into the water from the mast foot on the starboard side. She presumed that he could have slipped on a line or the sail. There had not been any sudden heeling of the boat caused by a wave.

She further stated that she steered the SY with engine power in the direction of her husband drifting in the sea. They made eye contact, and she observed that her husband took off his shoes and threw them in the direction of the boat. At a distance of approx. 2 m she discovered that he was drifting without any movement with his head forwards and his arms wide-spread in the water in front of the sailing yacht and shortly after this he went under which caused her to panic.

As regards the use of life saving appliances the witness stated that she and her husband generally did not wear any lifejackets at sea. Lifejackets only had to be worn when they had children on board. She also stated that after her husband had gone over board she did not think of throwing life saving appliances to him or loosening the small inflatable boat. She was of the opinion that she would be able to pick up the man over board from the water without any further problems. After she did not succeed in doing this, she was no longer in a position to provide any immediate aid or call for assistance quickly.

She also stated that she had never bathed in the sea from the yacht during a sailing voyage. She and her husband had always strictly declined to do this. Although they had fundamental knowledge about behaviour in the case of man-over-board (training to obtain the "Sportbootführerschein" Certificate), neither of them had any practical experience such as participation in rescue exercises.

[1] In other publications known as "Man over board"

5.1 Weather expertise

5.1.1 Weather situation

In the night from 20 June to 21 June 2004 the western Baltic Sea was on the south side of a low pressure eddy with the centre over South Scandinavia. Cool sea air was flowing in with a southwest air current.

5.1.2 Weather and sea conditions

At about 22.00 h CEST on 20 June 2004 there was a southwesterly wind of on average force 3 - 4 Bft. in the sea area southwest of Gedser. No gusts over 5 Bft. occurred. Altogether from the afternoon onwards, there was a trend towards weakening of the wind. The horizontal visibility was 25 km.

The data regarding the mean wind force in Beaufort correspond to the 10-min-mean of the wind speed.

With the given wind force conditions, depending on the wind direction, wind action duration and the wind fetch, it was possible for a sea with characteristic wave heights of around 0.5 m with periods of around 3 s to develop.

The data on the wave heights relate basically to the characteristic wave height. This corresponds to the arithmetic mean of the upper third of the wave height in an observation period. This means that a number of individual waves is higher than the characteristic wave height. In rare cases, individual waves can exceed the characteristic wave height by 70% to 100%.

5.1.3 Summary

The analysis of the weather and sea data available for 20 June 2004 at about 22.00 h CEST revealed that in the sea area southwest of Gedser there was a SW wind blowing with a mean force of 3 to 4 Bft. Very good visibility prevailed with a horizontal visibility of 25 km.

6 Analysis

The investigations of the BGS into the course of the accident and according to the report by the Danish Forensic Medical Institute the autopsy and subsequent post-mortem examination conducted revealed no indications apart from age-related health condition other than death by drowning. Accordingly it can be assumed that the man standing at the mast foot on the starboard side of the cabin superstructure slipped shortly before 22.15 h on 20 June 2004 while pulling down the main sail on deck and fell backwards into the water over the starboard boat railing, which was 68 cm high measured from the upper deck (see Fig. 4).

Since the witness states herself that she had never practiced a practical "Person over board" manoeuvre, she might possibly have underestimated the life-threatening situation connected with her husband falling over board. She omitted to use a lifejacket or other means of life saving appliances such as e.g. the inflatable boat at once. Only the fact that her husband was drifting unmoving and head down led to her becoming panic-stricken and not initiating help, search and rescue measures immediately.

In view of the fact that the garments became soaked full of water, it is to be assumed that the man partly tried to discard these in order to reach the yacht by swimming. His own actions could have led to swift exhaustion of the man setting in, as is confirmed by the wife's statement that her husband was drifting without moving. As a result of the lack of a lifejacket the man quickly lost his strength to keep himself above water and shortly after this he went under and drowned.

The transmission of the exact position of the emergency call issued and the search initiated by herself and by others were made more difficult since the "Person over board" key on the GPS receiver was not pressed and no courses or positions were entered in the sea chart used. Moreover, the nautical publications (sea charts, sailing directions) were obsolete and had not been kept up to date. The automatically inflatable working safety jackets were not maintained, and in view of their age should have been replaced. However, like the lifejacket at the stern and the distress signals on board, they were not used. The fact that the wife was in a condition of shock explains why the life saving appliances on board and the inflatable boat that was secured ready for use at the stern were not used. Although she is an experienced sailor, she did not succeed in bringing in her husband - who was within sight - on board.

The slipping while pulling down the main sail was promoted by the fact that there was no anti-slip covering on deck (see Fig. 3) and by a characteristic wave height of about 0.5 m with periods of about 3 s at wind strength of 3 to 4 Bft. and the associated rolling of the boat. No impairment attributable to the health condition of the injured man could be demonstrated.

6.1 Cause of the accident

The very serious marine casualty with resulting death is attributable to the fact that the skipper, not secured by a lifebelt, a lifejacket or an inflatable working jacket, slipped on the smooth deck at the mast foot while bringing down the main sail and fell over board. The direct rescue measures that were not carried out properly can be explained by the condition of shock of the wife on board.

7 Safety recommendation(s)

All operators and skippers of leisure craft must ensure that depending on the area sailed (high seas, coastal waters, protected waters) their boat is of such a nature that the risk of falling over board is reduced as far as possible and re-entry is facilitated. Even experienced leisure craft skippers should constantly review their readiness for risks. The structural requirements of the Directives 94/25/EC and 2003/44/EC of the European Parliament and the Council, the CE-Guidelines for Leisure Craft and the Safety Guidelines of the Cruiser Department of the German Sailing Association (Deutscher Seglerverband e.V.) as well as the brochure "Safety at sea and in coastal areas" (Sicherheit im See- und Küstenbereich) of the Federal Maritime and Hydrographic Agency (BSH) should be observed. As regards the "Person over board" manoeuvres, reference is made to the training in sailing schools, regular practical exercises and the relevant technical literature. The BSU also refers to its Investigation Reports 338/03 SY LISA and 122/04 SY RENI.

8 Sources

- Investigations by
  - Federal Border Guard, Sea, - Bundesgrenzschutzamt See (BGS)
  - Survey on board ALENA by the Federal Bureau of Maritime Casualty Investigation (BSU) and the BGS

- Written declarations/comments
  - Investigation Report by BGS
  - Construction yard Woubrugse Jachtwerf G. van Wijk&Zoon Netherlands

- Witness statements
  - Wife

- Expert opinion/technical contribution
  - Forensic Medical Institute, South Danish University

- Sea charts
  - Bundesamt für Seeschifffahrt und Hydrographie (Federal Maritime and Hydrographic Agency (BSH))
  - Nautische Veröffentlichungen Verlagsgesellschaft mbH Arnis

- Official weather expertise
  - Deutscher Wetterdienst (Germany's National Meteorological Service (DWD)) Division Sea Shipping (Sea Weather Bureau)

- Documents
  - Sicherheit im See- und Küstenbereich (Sorgfaltsregeln für Wassersportler) BSH [Safety at sea and in coastal areas (Rules of care for yacht persons)]
  - Safety Regulations (Equipment and safety of sailing yachts/multiple-hull boats) Kreuzer-Abteilung des Deutschen Segler-Verbandes e.V. (DSV) (Cruiser Division of the German Sailing Association)
  - EC Directive 94/25/EC
  - EC Directive 2003/44/EC
  - CE Guidelines for Leisurecraft

Figure 3: Position of the injured person

Figure 4: Height of railing

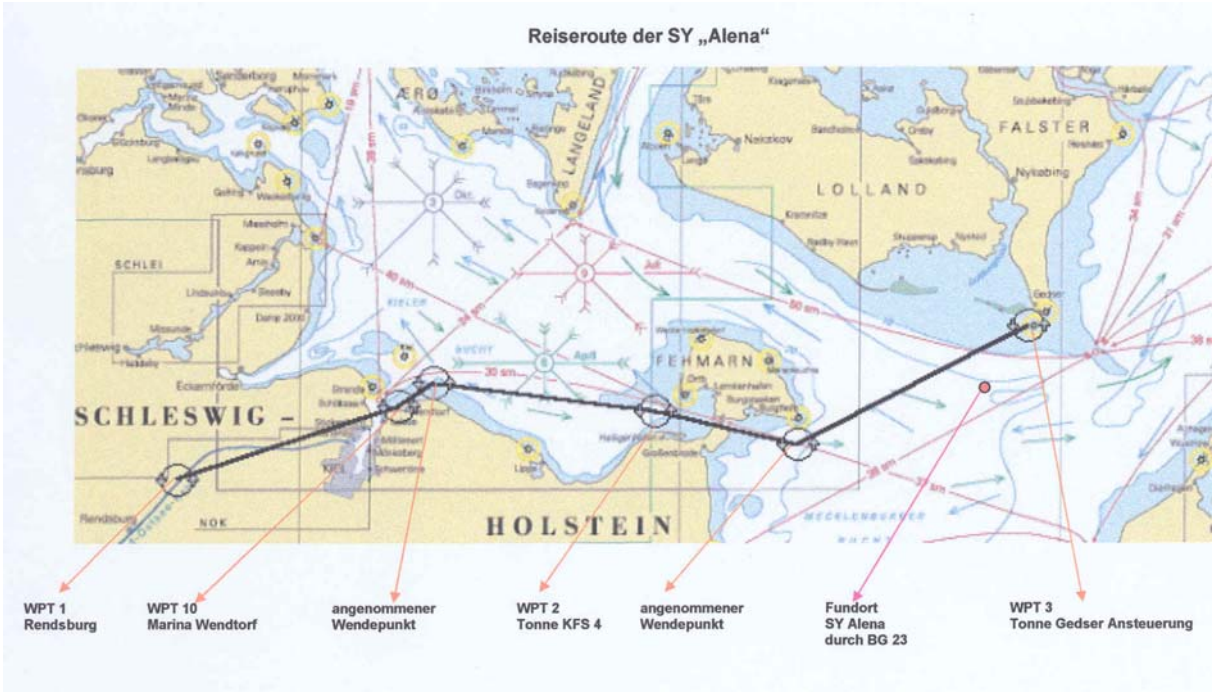

Figure 5: Travel route

Figure 6: Lifejacket and mast mount

Figure 7: Inflatable boat packed

Figure 8: Inflatable working jacket

Figure 9: Distress signal unit

Figure 10: Weather panel

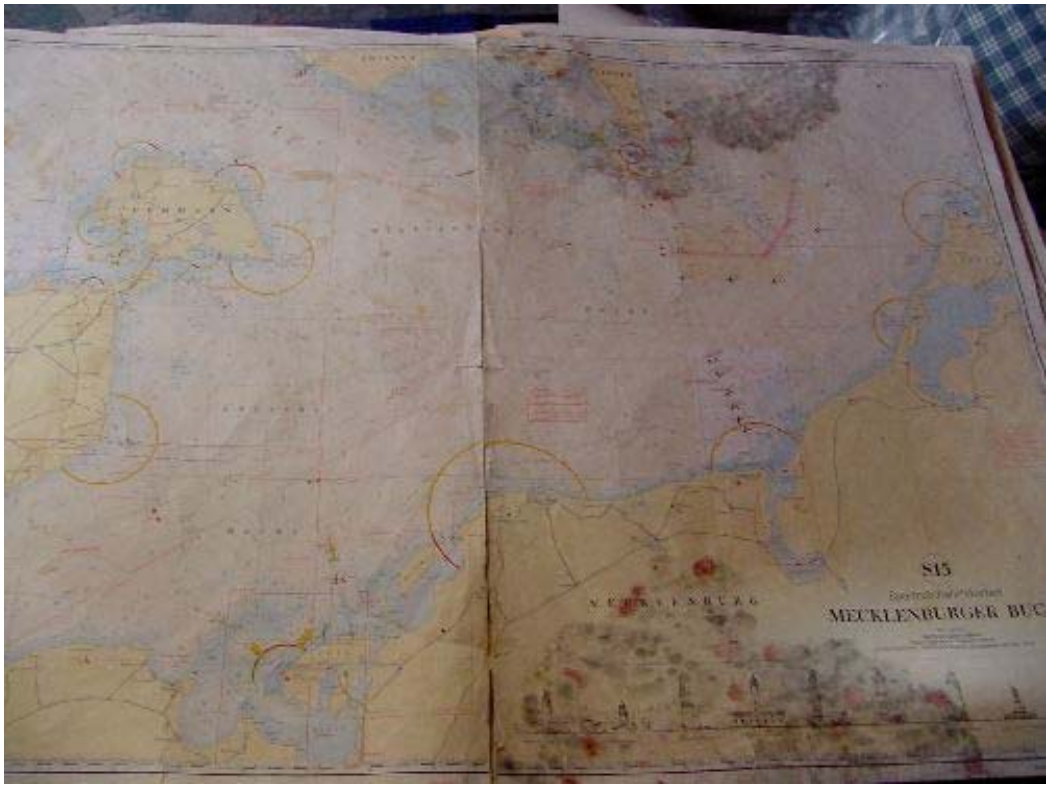

Figure 11: Plotting chart

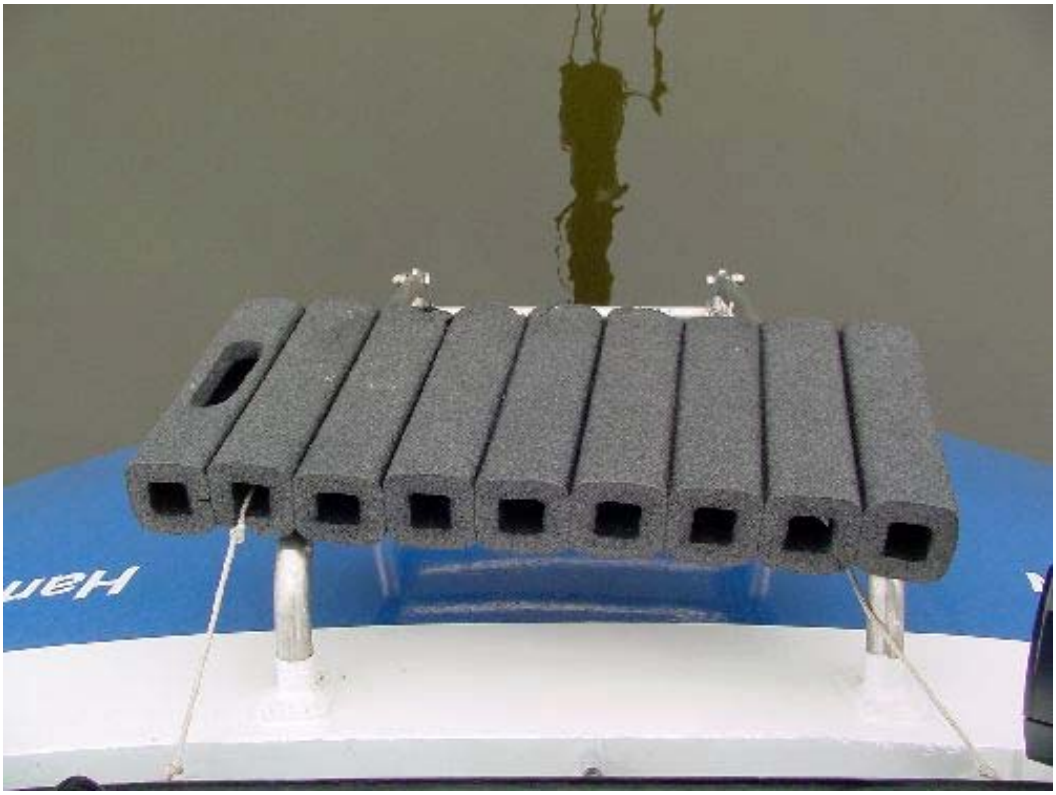

Figure 12: Mounting of inflatable boat