



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

## **Investigation Report 338/03**

**1 July 2004**

**Very Serious Marine Casualty**

**Loss overboard of a yachtsman  
sailing on board SY LISA  
on 8 November 2003  
east of Fehmarn at the  
buoy "Staberhuk Ost"**

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.

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## 1 Summary of the marine casualty

On Saturday, 8 November 2003, the SY LISA coming from Gedser was sailing on a starboard bow with easterly winds force 5 to 6 Bft, heading for Staberhuk, Fehmarn. At the buoy "Staberhuk Ost" the yacht changed to a westerly course, heading for Burgstaaken. Directly after a jibe to the port bow initiated with the change of course, a securing line fitted to secure the sail boom ruptured. The boom already standing midships swung quickly over to starboard, as a result of which at about 14.10 h one crew member lost his hold and was hurled overboard over the starboard bulwark. Rescue manoeuvres initiated immediately to recover the yachtsman, initially swimming in the water and after several unsuccessful attempts in the meantime drifting with his head under water, and a little later not seen any more at all, remained unsuccessful. At approx. 14.50 h the search for the casualty was broken off and subsequently the yacht made for the port of Burgstaaken where the incident was reported at approx. 16.05 h. However, an extensive search for the missing person initiated after this remained fruitless.

On 14 December 2003 a corpse was washed ashore and could be identified as the missing crew member from on board SY LISA.

## 2 Scene of the accident

Nature of the incident: Very serious marine casualty  
 Date/time: 8 November 2003 at approx. 14.10 h  
 Location: approx. 1.5 nm east of the Staberhuk Lighthouse  
 Latitude/longitude: approx.  $\phi$  54°24'N  $\lambda$  011°21'E

Excerpt from the sea chart, official charts for leisure craft  
 Series 3005, No. 16, BSH

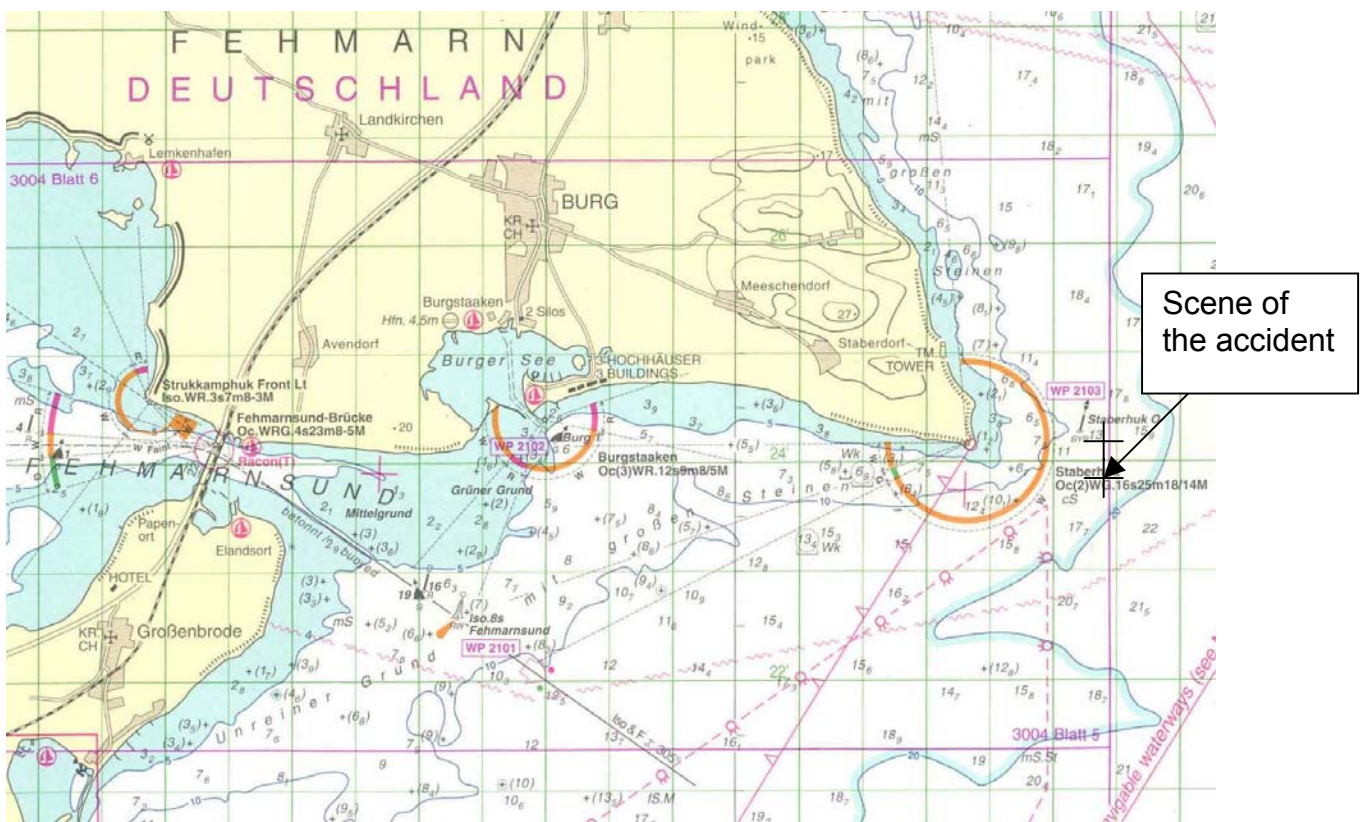


Figure 1: Sea chart

### 3 Vessel particulars

#### 3.1 Photo



Figure 2: Photo of vessel

#### 3.2 Particulars

Name of vessel	LISA
Type of vessel	Leisure craft/gaff cutter, type Haikutter
Nationality/Flag	Federal Republic of Germany
Port of registry	Möltenort
Call sign/IMO Number	none
Ship's Certificate	5 SSR 2725
Year built	1996/1937
Building yard/building number	Rödbyhavn Badevaerft/DK
Classification society	none
Length over all	hull length 11.62 m, with jib 14.73 m
Width over all	3.76 m
Displacement	approx. 16 t
Draft of the time of the accident	1.85 m
Engine rating	89 kW
Main engine	Mercedes 6-cylinder, type OM 312
Speed	7.5 kn
Propulsion	right-hand propeller, sail area approx. 84 m <sup>2</sup>
Hull material	wood
Number of crew members	4

## 4 Course of the accident

### 4.1 History of the vessel

The sailing yacht was built in wood on behalf of the present owner at the Danish boat yard Rödbyhavn Badevaerft. The vessel is not a complete newbuilding, but instead the stem post and the fore ship and aft ship frames of a fishing boat of type "Haikutter", built in 1937 in Middelfahrt, Jütland, were used. The midships area with the former fish well were made with new frames made of glued timber. The wood for the deck area was supplied by the owner.

The vessel has a continuous deck without any recess or cockpit.

The sails consist of a 52 m<sup>2</sup> gaff mainsail, a 15 m<sup>2</sup> fore sail and a 17 m<sup>2</sup> jib sail, resulting in altogether approx. 84 m<sup>2</sup> sail area.

The vessel was entered in the Sea Ship Register at the local court in Kiel on 6 November 1996 as a new building under the designation "Motorsailer in wood; type Haikutter".

### 4.2 Persons on board SY LISA

At the time of the marine casualty on 8 November 2003 four persons not related to one another were on board, sailing as guests and at the same time as crew on the transfer voyage.

#### 4.2.1 Skipper and owner, Mr. A

The vessel was under the command of the 69-year-old owner, holder of a Leisure Craft Licence Sea, dated 28 March 1976, a DSV BR-Certificate, dated 13 May 1977, and a Sports Coastal Skipper Certificate of 18 April 2001. No sufficient findings could be obtained concerning the seamanship expertise and sailing capabilities of Mr. A. According to the documents of the Water Police, Mr. A worked for a relatively long time as Master on relatively large sailing craft. After preparation of the draft of the Investigation Report, Mr. A submitted documents to the BSU according to which he was entered in the Employer's Register of the See-Berufsgenossenschaft (See-BG – German safety organisation) from 1983 to 1996 as part-time mariner. Commercially he used an approx. 20 m long, two-masted former freight sailboat for charter trips at most 15 hours per week.

With regard to his seamanship qualification Mr. A stated that he had been at sea from 1956 to 1958 within the framework of a career-related deck training with the merchant navy.

#### 4.2.2 Co-yachtsman, Mr. B

The 63-year-old co-yachtsman Mr. B holds a Leisure Craft Licence Sea, issued on 18 November 1987, the Motorboat Licence Inland A of 9 May 1988, a Sports Coastal Certificate of 29 December 1999, a DSV BR Certificate dated 2 July 1993, and a Radio Certificate for VHF with restricted validity issued on 6 March 1988. He stated that his practical sailing experience was very slight. During the period 1994 to 2002



he had owned a sailboat of type "Nauticat 33" with which he mainly proceeded under engine and sometimes with sail support on voyages from Kiel and other places. He had chiefly made trips under engine power with Mr. A on Mr. A's previous boat. He had been on board the SY LISA several times to help with work. He had not known the sea behaviour and sailing properties of the vessel before, but after the voyage he could describe them as good.

#### **4.2.3 Co-yachtsman Mr. C**

The 18-year-old Mr. C has no experience on board ships. He gained his first knowledge of sailing on board SY LISA with the owner, Mr. A, during the Hanse Sail. During the Hanse Sail the vessel sailed with 10 to 15 guests under sail and engine power with little wind. During the following period he had helped with maintenance work on board at the berth in Rostock on several weekends. He knew the layout and stowage places on board. As a reward for his work he was allowed to join the transfer voyage from Rostock to Kiel.

#### **4.2.4 Co-yachtsman Mr. D who sustained the fatal accident**

According to the information supplied by the co-yachtsman, Mr. B, the 53-year-old co-yachtsman casualty had taken the examination for Leisure Craft Licences and BR Sailing Certificate together with him. Mr. D's knowledge of sailing and experience on board vessels had been better and more extensive than those of the co-yachtsman Mr. B. The yachtsman casualty had reportedly frequently been an active co-yachtsman on charter yachts.

Mr. D had been on board SY LISA for the first time.

### **4.3 Course of the voyage/course of the accident**

In order to have the vessel closer to the owner's home during the winter months it was planned to transfer the sailing yacht from Rostock to Möltenort, Kiel. The voyage was carried out so late in the year because the owner had to wait for free berths for the winter season in the port of Möltenort. The group met in Kiel on 6 November 2003 to travel to Rostock together. They spent the night on board the vessel in the port of Rostock. It had originally been planned to voyage directly to Kiel. However, since they definitely wanted to proceed by daylight, an intermediate stop in Heiligenhafen or Burgstaaken was intended.

There were no instructions on handling the life-saving equipment. The skipper had only pointed out the life-rafts standing in plastic bags on the deck. No "man-over-board" manoeuvres were discussed or practised, since Mr. A, Mr. B and Mr. D had already carried these out several times beforehand on board other vessels.

The co-yachtsmen were not instructed in the operation of the radio set. However, Mr. B and Mr. D were familiar with the operation of a radio set on the grounds of police activities.

The co-yachtsmen were instructed on the operation of the main engine, the rudder and the sails.

#### **4.3.1 Voyage section from Rostock to Gedser, Denmark**

The jib boom first had to be mounted in Rostock on 7 November 2003, so that the vessel only cast off very late, roughly between 10.00 and 11.00 h. The port of Gedser, lying closer, was selected as target destination since the crew was of the opinion that the fuel on board would not be sufficient for the complete run to Møltenort. At the time there was an easterly to north-easterly wind of force 3 to 4 Bft and the vessel steered a course of 350° under engine without sail support. The vessel was largely steered by Mr. B in accordance with the instructions of the skipper. The vessel headed and steered well despite the swell. Apart from Mr. C, who was largely seasick, the other persons were on deck.

After dark set in at approx. 17.30 h the vessel made fast in Gedser and the crew spent the night on board.

#### **4.3.2 Voyage section from Gedser, Denmark, to Burgstaaken, Fehmarn**

After fuelling on 8 November 2003 at approx. 11.10 h and setting both fore sails and the mainsail in the port, the vessel cast off under sail and with the main engine.

The last terrestrial position was the south cardinal buoy "Schoenheyders-Pulle" that was passed approx. 5 m on the starboard side at 12.00 h. At this time a wind increasing 4 to 5 Bft from the east was blowing, with a current of approx. 0.5 kn in the westerly direction. The vessel steered a course of 245° with an angle of heel of approx. 20° on a starboard bow, under sail with the engine running and engaged. The wind then increased to 5 to 6 Bft and the wave height was stated as 1.5 m and from time to time 2.0 m. The vessel ran without any problems at 8 kn with slackened mainsail and engine support and a swell coming at an angle from aft.

At 13.30 h Staberhuk came into sight to starboard. At approx. 14.00 h the skipper discussed a jibe manoeuvre with the persons on deck to change the course to the port bow and subsequently head for the buoy "Burg 1". Apart from Mr. C, who was lying dressed on the starboard bunk below deck due to his seasickness, all the crew were instructed by the skipper regarding the danger of the boom going over during the jibe and "racing" sheets.

The co-yachtsman Mr. B could not pull in the 18 mm thick, 6-fold main sheet on his own, so that Mr. C was called on deck to assist. After the two, kneeling on deck, had hauled the boom almost midships with a "heave-ho" method, the co-yachtsman Mr. D secured it with several round turns with a 12 mm securing line aft on one of the cleats next to the hawse pipe. The gaff was already on the port side when it swung over to starboard with great force as a result of the vessel fetching over and running out of the course; the securing line ruptured in the bottom third and the co-yachtsman Mr. D was hurled over board at approx. 14.10 h by the force of the boom swinging to starboard.

The skipper, who had been standing at the helm since Gedser, shouted "man over board" and steered hard to starboard with the engine at full speed. The mainsail was made fast to starboard and the two co-yachtsmen were instructed to look out for the man who had gone over board. A few minutes later the scene of the accident was reached again and Mr. D was discovered to port, drifting aft. A second manoeuvre was carried out with full engine speed, turning over the starboard bow, and after the man drifting approx. 4 m away to starboard was reached he grasped a line thrown to

him, but let go of it again soon, under load, and drifted aft again. After this manoeuvre Mr. B tried to obtain help via the VHF radio set but no contact could be made. After the third turning manoeuvre over starboard bow, unsuccessful attempts were made to catch Mr. D with the boathook. The man drifting in the water was too far away from the sailboat and they only got close enough to him to be able to grasp him after the fourth turning manoeuvre. However, the boathook slipped off the smooth surface of the weather jacket. At this time Mr. D was already lying face down with his head under water and arms outspread and drifting aft again. After the fifth manoeuvre nothing more could be seen of Mr. D. The vessel turned several more circles and only saw a bobble-cap and gloves drifting in the water. The search was broken off at 14.50 h, the mainsail furled and the course set for Burgstaaken. According to the information supplied by the skipper, they proceeded to the port at a speed of approx. 8 kn with 2000 rpm.

At 15.50 h the Harbour Master in Burgstaaken was informed via the skipper's mobile telephone and at 16.00 h the Water Police at the berth in Burgstaaken were notified by the Harbour Master.

Contradictory statements were made by the co-yachtsmen regarding the course of the accident, the place where the yachtsman who went over board sustained the accident, the fastening point of the securing line, and the number of turning manoeuvres sailed, and these could not be clarified subsequently.

#### **4.4 Voyage by the Coastal Patrol Boat (KB) FEHMARN**

The police craft KB FEHMARN was on a patrol voyage south of Fehmarn with five water police on 8 November. At approx. 14.53 h, according to the extract from the electronic Transas sea chart, the vessel was at position  $\phi 54^{\circ}23,71'N \lambda 011^{\circ}18,22'E$  on a heading of  $092^{\circ}$ , at a speed of 12.5 kn and approx. 4 cables away from the shore south of the tip of Staberhuk.

At this time the only vessel approaching them in the opposite direction on the starboard side, at a distance of approx. 1 to 2 cables, was the SY LISA. The vessel was proceeding without a mainsail set and with two fore sails set, at an estimated speed of 3 to 4 kn. A figure in a dark anorak (probably Mr. B) was sitting at the helm and despite the swell and slight rolling the vessel lay relatively calmly in the water. There was good visibility contact with the person on deck, who was observed over a period of approx. 15 min. This person was sitting passively at the helm and did not give any hand signs or emergency signals or any other signals calling for assistance that could have indicated an emergency. At about 16.10 h the crew of the patrol boat was notified by the Water Police Station in Puttgarden of an emergency at sea. The vessel was only able to reach the scene of the accident in darkness at about 17.00 h and under the direction of the German Sea Rescue Service (DGzRS) an extensive search was carried out with altogether seven vessels, but this had to be broken off without results.

According to the information supplied by Mr. A, the SY LISA had sighted the police craft. However, a further search for the person who had gone over board would not

have made any sense and therefore no information had been passed on to the patrol boat. For the same reason the marine casualty had not been reported via the mobile phone on board.

In his comment on the draft of the Investigation Report the skipper states that he had not alerted the patrol boat because he was in a state of shock and had intended to inform the authorities on shore as quickly as possible and without delay.

The other co-yachtsmen stated that they did not see the coastal patrol boat FEHMARN.

The Coastal Patrol Boat FEHMARN has the following main dimensions

Length overall.	28.30 m
Moulded breadth	6,20 m
Draft	1.96 m
Speed	21.0 kn
Engine rating	1197 kW



Figure 3: Coastal Patrol Boat FEHMARN

## 5 Investigation

### 5.1 Condition of the vessel

It is known that the Haikutter vessels, that chiefly fish in the North Sea, have good seagoing qualities. During the transfer voyage there were no negative assessments of the sea behaviour according to the statements made by the yachtsmen on SY LISA. The freeboard measured from the main deck to the water surface was approx. 0.50 m aft in the area of the fastening points for the main sheet, and the bulwark was also 0.50 m high in this area. The length of the vessel hull, measured with a measuring tape, was 11.60 m. The hull shows normal traces of wear and tear. On the port side there was an approx. 1 m long deep scratch mark and damage to the stem that had been touched up with red paint.

At the time of the survey by the BSU the sails were not expertly folded and altogether the deck was not cleared very tidily.

The name and port of registry were not marked on the hull. There was simply a removable plate in the shrouds on the port side marked with the name, sailing club and port of registry.

The vessel has a Ship Measuring Certificate and is registered in the Sea Shipping Register.

#### 5.1.1 Interior

At the time of the survey by the BSU the vessel was in a good state of maintenance. The main engine is a 6 cylinder Mercedes Diesel engine of type OM 312. The engine is arranged directly next to the companionway. The engine plates and sound insulation towards the front and middle of the vessel were not on board.



Figure 4: Main engine viewed from forward

With the engine standing open like this there is a risk that during swell and with a running engine hot or turning parts could injure someone. Since there is no sound insulation it is problematic to communicate using the radio set installed directly next to the engine on the port side, and communication on the aft deck is probably covered by the noises.

The owner, Mr. A, informed the BSU that he had had the engine plating at home, since he had planned to paint the engine before installing it. As he was going to be spending most of the time on deck during the voyage in any case, he would not have had any problems with the high noise level of the engine without its sound insulation. All the co-yachtsmen had been informed of the open condition of the engine compartment and had been instructed to keep away from it.

### 5.1.2 Deck area

SY LISA has handrails on the port and starboard sides throughout the entire superstructure area. There is no possibility of securing stretch ropes on deck. The steering stand with the most important engine operating and display instruments is arranged unprotected in the aft part of the vessel. A check of the hydraulic rudder system revealed that the rudder position indicator did not react and there was no possibility of inserting an emergency tiller directly on the rudder head. There was no bow pulpit or stern pulpit.



Figure 5: Bulwark and superstructure

The bulwark is 0.50 m high and thus does not comply with the safety guidelines of the Cruiser Division of the German Sail Association (DSV) for equipment and safety on sailboats. This guideline states that the sea railing must be at least 0.60 m high above the working deck.

## 5.2 Main sheet arrangement

The main sheet consists of 18 mm brown Roblon rope. A 2-sheave block with becket is mounted on the port side and a single-sheave block on the starboard side, while a 3-sheave block is secured to the main boom.



Figure 6: Mainsheet arrangement

There are no swivel shackles on the blocks so that the sheet lead is firmly fixed. The fastened end of the sheet is secured to the becket on the block on the port side and runs from there to the 3-sheave block on the main boom and then to the single-sheave block on the starboard side, back to the block on the main boom and altogether twice again to the block on the port side. The loose part is guided from the port side to the starboard belaying cleat. The deck-horse midships is not equipped with blocks. The distance between the blocks and the deck is approx. 1.40 m. This sheet arrangement means that the boom has a slack of approx. 0.80 m to 1.30 m when the sheet is pulled in tight. The simple 12 mm securing line, not executed as a pulley, is only to be considered as a safeguard measure against the boom swinging round when the sails are down, and does not represent any assistance when jibing. Performing a jibe without the assistance of a multiple-sheave securing pulley is problematic, since the boom cannot be brought midships due to the arrangement of the sheet lead.

## 5.3 General equipment, navigational equipment

A GPS receiver "Admiral" from the firm Micrologic is installed below deck on the port side, with a GPS repeater unit "Autohelm ST 50 Plus" outside at the steering stand.

The aerial for the GPS unit is mounted aft at the steering stand on the instrument box. An operating test revealed that both units showed the same latitude and longitude. However, these data were not identical with the berth of the vessel in Burgstaaken, but instead the position for the port of Møltenort was shown.

The owner stated that the unit had been inspected by a specialist firm; it reportedly had a technically irreparable defect and was thus not operable. He also reported that there had been no Man-Over-Board-Key. It can be seen from the operating instructions for the repeater unit that by pressing the keys: "Track" and "V" the MOB function can be activated, provided that the device is technically in order. The owner also stated in a discussion that he only carried out terrestrial navigation and that he had been sailing in this area for a good 35 years, knew all the relevant landmarks and navigated in accordance with these when visibility was good without having to use a sea chart.

In addition there was a magnetic compass from the firm Hartmann, Hamburg, No. 5808 and an echo sounder from the firm Eagley, type Magna III, at the steering stand. The echo sounder was not operable. According to the information supplied by the owner the defect was based on growth, which he had formerly often had removed by divers. There was an electrical rudder position indicator and displays, alarms and a start button for the main engine mounted at the steering stand. A signal horn/foghorn was lying aft next to the helmsman.

It was not possible to check the accuracy of the magnetic compass and no deviation table was found on board. The leisure craft sea chart S 24 published by Delius-Klasing and the logbook were secured by the Water Police directly after the accident. There was a relatively new, approx. 2.5 m long wooden boathook with tip, hook and a loop at the end on the superstructure.

## 5.4 Life saving equipment

### 5.4.1 Liferaft

There was a liferaft lying unlashd on a ship's pad on the fore ship. The manufacturer and type could no longer be clearly ascertained.



Figure 7: Liferaft



The pull-line/release line was projecting from the liferaft and was not fastened anywhere. According to the print mark still legible on the liferaft container, the last date of testing was 4/88 and the liferaft was licensed for 6 persons.

The owner stated that this had been checked technically by a non-authorized person and had not received any current sticker with the test date.

#### 5.4.2 Life jackets

Altogether seven old solid life jackets from the firm Kadematic were found lying on the aft deck packed in two plastic bags, next to the steering stand on the starboard side. These jackets that were formerly authorized by the safety organisation See-BG did not have any reflecting strips or any life jacket lamps. The owner stated that he had received altogether 20 jackets from the former ferry DEUTSCHLAND. The following different statements were made regarding the storage location on deck at the time of the accident. One person stated that the two bags had been at the front. The second statement was that two bags were aft, and the third statement claimed that two bags had been at the front and an additional third bag aft on deck.



Figure 8: Life jacket

Five inflatable life jackets were found below deck in a cupboard on the starboard side. None of the jackets were operable anymore. The carbon dioxide cartridges for automatic/manual filling were no longer present in four jackets, so that these were totally unfit for use, since without the cartridges the air would have escaped again through the open screw aperture if the jackets had been blown up by hand. The CO<sub>2</sub>-cartridge of the fifth jacket was empty. However, it would have been conditionally fit for use if the jacket had been inflated by hand.

### 5.4.3 Life buoys/rescue harnesses

A new safety ladder on board with four wooden steps had not yet been spliced completely to the end. The fastening lines and side guiding lines were loosely tied together and the ladder was thus only conditionally fit for use.

No life buoy or solid life-cape was found on or below deck. There was only a new "Compass" rescue harness, fit for use and firmly packaged, beneath the starboard berth below deck, provided with 45 m floating line and a holding bag for attaching ready for use on a sea rail.



Figure 9: Rescue harness

No rescue lamps, rescue flashes, rescue buoys (man-over-board buoys), smoke signals or other means for marking the position were found on board.

### 5.4.4 Safety belts/safety lines/emergency signals

There were no safety belts or safety lines on board. Due to the vessel's construction it was not possible to fit stretch lines and so-called corpse-catchers (nets) on board. The pyrotechnical emergency signals on board comprised a red manual parachute rocket and two small red manual rockets. The use-by date had expired on all of these.

#### **5.4.5 Radio equipment**

A "Shipmate 8300" radio set is firmly installed on the port side next to the companionway. There is no radio antenna in the mast top and the transmission and receipt cables were reportedly installed loosely in the hull of the vessel by a boat builder. The radio set on board does not have a digital selective system (DSC). On inspection by the Water Police two days after the accident the radio set was set to channel 8 with volume 3 according to the display on the hand-headset. The operational check of the unit revealed that no connection could be made on channel 8 and the cause of the malfunction could not be determined. A connection with good communication facilities via the call and emergency channel 16 functioned soundly. Despite a firmly installed radio set, no call sign was determined. The Master was unable to present a valid Sea Radio Certificate. The co-yachtsman Mr. B had not been instructed in the special features of the sea radio set and sea radio traffic.

The investigations by the Water Police further revealed that the skipper had conducted several telephone conversations with his mobile phone directly after the accident without informing the Maritime Rescue Coordination Centre. In response to questioning the skipper and the co-yachtsman Mr. B answered that they had not thought of the mobile phone at all any more and otherwise would have dialled the number 110/112 (German emergency call numbers) in the event of an emergency.

#### **5.5 Crew**

The seamanship and sailing capabilities as well as the practical experience of the crew members are to be considered as very slight or non-existent. The crew consisted chiefly of inexperienced persons. The sailing manoeuvres, especially the "man-over-board" manoeuvre, were not discussed sufficiently and not carried out practically. The preparations prior to starting the voyage are to be considered as not sufficient. For example, no warm beverages were kept available despite a prevailing air temperature of only 4° C. A voluntary alcohol test and the results of the autopsy of the injured yachtsman revealed that no alcohol had been drunk on board.

## 6 Analysis

The objective and the scope of activity of the BSU are defined in § 9 Maritime Safety Investigation Law (SUG). According to this definition the purpose of the marine casualty investigation is "neither to determine facts for the purpose of allocation of faults in order to bring about disadvantages for individuals, nor to determine blame, liability or claims. However, it should not disregard unrestricted presentation of the causes simply because the results of the investigation might allow conclusions indicating faulty behaviour or responsibility under the law on liability."

The marine casualty with a fatality is attributable to the fact that the unsecured co-yachtsman lost his hold due to a sudden rolling motion of the vessel in conjunction with the boom swinging round and fell over board.

The skipper knew as a result of the weather reports that winds up to force 6 Bft from the east were expected. Throughout the entire voyage the skipper did not issue any instructions to the crew to put on the life jackets available.

The "man-over-board" manoeuvre and fitting of life jackets were not practiced. As a result of the prevailing wind direction it was evident that it would be necessary to change course off Fehmarn. This change in course was to be carried out under full sail approx. 1.5 nm east of Staberhuk by means of a jibe. The skipper was familiar with the dangers pertaining to a jibe. He could have carried out this manoeuvre after first taking down the main sail or in the form of tacking. Ultimately, he decided on a jibe under full sail. This manoeuvre was carried out too early and not decidedly enough, so that the boom/gaff that were already on the new bow, swung over, a securing line fitted ruptured, and a co-yachtsman went over board. This securing line cannot be equated with a boom vang (kicking strap) fitted forward in the form of a rope or a sheaved pulley and the use of this line with the sails set does not make any sense. There were differing statements about the way and the place this line was belayed and the place where the lost yachtsman was standing. According to the assessment of the BSU, the space on the aft ship between the superstructure and the steering stand is relatively small to offer a person space to be pulled from the port side over the whole width of the vessel to starboard. Moreover, this area was filled with two co-yachtsmen standing behind one another and pulling on the sheet, and possibly also with the bags full of life jackets. For the further course of the accident it is irrelevant whether the "securing line" was secured on the port side or the starboard side and whether the lost co-yachtsman was flung from the port side over the entire aft width of the vessel or only fell over board from the starboard side.

The rescue manoeuvres carried out after this were unsuccessful.

After the crew member went over board the fore sails and the mainsail were not operated at all so that the vessel could not be brought into the wind. No attempts were made to sail a manoeuvre over the port bow, although with a right-hand screw the turning circle is evidently smaller than over the starboard bow. The different statements as to whether four or five "man-over-board" manoeuvres were carried out were not evaluated, since each unsuccessful manoeuvre is one too many.

The life-saving and emergency equipment was insufficient or not on board at all and was not used at all either. Part of the duty to take care in seamanship that belongs to

the basic rules of behaviour in traffic is to take the necessary safety equipment on a voyage (§ 3 Para. 1 Sentence 2 SeeSchStrO). Throwing any floating life-saving appliances, whether practicable or not, could have had a positive psychological effect on the man in the water in addition to being a floating aid.

It is not plausible why no alert was given by radio set, mobile phone, emergency rockets or direct contact with the approaching Water Police craft.

The accident is essentially attributable to circumstances lying within the scope of responsibility of the owner and skipper. As a result of these circumstances the lost man fell over board, it was not possible to throw life-saving appliances to him immediately and he could not be recovered in time.

The claim made in specialist literature that in sailing and yachting sports lives are lost primarily not due to falling over board, but because casualties do not return to the safe deck of the yacht in time is tragically confirmed in this case.

The result of the autopsy showed no signs of injuries to the body due to a blow, e.g. from the boom, or other possible causes of damage, but instead death by drowning.

## 7 Safety recommendations

The accident with the sailboat LISA has shown that the important "Man-over-board" manoeuvre must be repeatedly practiced and that leisure craft sailing in coastal areas should be equipped with a minimum of safety standards. The following safety recommendations are addressed to training schools, sailing clubs and all water sports people.

### 7.1 "Man-over-board" manoeuvre

Prior to starting a trip a "man-over-board" manoeuvre must not only be discussed hypothetically, but also be carried out practically at sea. After this exercise there should be a meeting to discuss the manoeuvre, in which role distribution and role exchange in the case of emergency are discussed, under the aspect that the skipper who carried out the practice manoeuvre very well could himself fall over board. While the manoeuvre strategies differ for the various types of vessels such as sailboats, motorboats or sailboats under sail with engine support, the measures directly following a "man-over-board" accident are essentially the same for all the craft.

The following measures should be taken to allow swift rescue:

- ◆ The person noticing the accident must shout "Man over board!" immediately, ensure that the other crew members are alerted, and throw a life buoy or life jacket as floating aid in the direction of the person who fell over board. This rescue facility must be optically conspicuous and have at least a night-light. In addition a marker buoy, smoke signal or some other floating unit should be thrown in the direction of the person over board to mark the scene of the accident.
- ◆ One person must be nominated to keep an eye on the person in the water and if appropriate to observe this person by day with binoculars and to illuminate the person with a floodlight at night.
- ◆ If a GPS is on board, the MOB (Man-Over-Board) key should be pressed and the time, course and location of the vessel be noted.
- ◆ For sailboats under sail, special manoeuvres have been developed that can be carried out without engine support (Q-tack with virtual shooting into the wind). Immediately after this manoeuvre is started on board these vessels, the engine should be started and only be engaged as needed in the final phase and the sheets slackened during the shooting into the wind.
- ◆ Other vessels should be notified of the accident by a Mayday call via radio, if appropriate via Channel 16, and asked for support, or the DSC emergency call should be sent. If there is a mobile phone on board it is possible to alert the Maritime Rescue Coordination Centre in Bremen, MRCC, via Tel. **124124** from all mobile radio networks without any dialling code when close to the coast with a range of approx. 2 to 4 nm and a transmission capacity of 0.2 watt.
- ◆ The equipment necessary to recover and provide first aid to the person over board must be cleared ready for use

All these measures should be carried out simultaneously and practiced several times with exchanged roles in order to cut down on stress in emergency situations.

## **7.2 Equipment and safety of sailboats**

The Special Regulations of the Offshore Racing Council (ORC) apply as binding international guidelines for minimum safety equipment and furnishings on board sea-going sailboats participating in sea regattas. These regulations of the ORC have been taken over by the Cruiser Department of the German Sail Association (DSV) as national guidelines and supplemented. The DSV recommends applying these guidelines by analogy for cruising yachts on sea and in inland areas. The essential contents of these guidelines for a yacht in Category 2 areas, voyages of relatively long duration along or not far from coastal lines, are set out below and should be observed by the owners and skippers.

### **7.2.1 Sea railing**

For vessels with a length of 8.50 m and more, the height of the upper railing line should not be less than 600 mm above the working deck.

### **7.2.2 Stretch ropes**

Stretch ropes should be fitted on deck on the port and starboard side of the yacht in order to ensure safe fastening of the safety belts. Appropriate bolted or firmly welded anchorage points for fastening the safety belts are to be provided at the most important work points, e.g. rudder, sheet winches and masts.

### **7.2.3 First-aid box**

The ORC recommends equipment with first-aid boxes with contents and packing in accordance with the conditions to be expected, the length of the voyage and the number of crew.

### **7.2.4 Navigational equipment**

#### **7.2.4.1 Ship's compass**

Fitting of a properly installed and compensated ship's compass, independent of any power supply and with a deviation table, in addition a reserve compass, independent of any power supply.

#### **7.2.4.2 Sea charts, light-buoy list and navigating instruments**

Nautical sea charts and books necessary for the area to be sailed and corrected and updated to the most recent status, not only in electronic form.

#### **7.2.4.3 Position finder**

Radio finder or GPS for automatic location determination and sounding line or echo sounder and speed-measuring device or log.

## **7.2.5 Emergency equipment**

### **7.2.5.1 Sea radio set**

A sea radio set consisting of a sea radio transmitter and receiver should be on board. A VHF system with a transmission capacity of 25 Watt should be provided with a mast top antenna.

### **7.2.5.2 Emergency radio buoys**

An emergency radio buoy (EPIRB), transmitting on frequency 121.5 MHz, 243 MHz or 406 MHz should be on board.

## **7.2.6 Safety equipment**

### **7.2.6.1 Life jackets**

Life jackets in accordance with DIN 7929 or DIN EN 396 guaranteeing a safe position in the water in the event of unconsciousness must be on board for each crew member. Tested life jackets have a CE code or a GS test number.

### **7.2.6.2 Safety belts and lines**

Safety belts and safety lines in accordance with ISO 12401, DIN 7927 or EN Standard 1095 must be kept on board for each crew member. The maximum length of the safety line with two carbine hooks at the end should not exceed 2 m.

### **7.2.6.3 Liferaft**

Liferafts in accordance with ISO 9650 with space for the entire crew must be carried on board. It must be possible to bring the liferaft to the railing within 15 seconds.

### **7.2.6.4 Rescue buoy**

A rescue buoy with a drift anchor or life sling (without drift anchor) and with a self-igniting light must be arranged within reach of the helmsman and be clear for immediate use. In addition a rescue buoy with whistle, drift anchor and self-igniting light and a rod with flag should also be arranged in the vicinity of the helmsman.

### **7.2.6.5 Pyrotechnical emergency signals**

Optical pyrotechnical emergency signals may not be older than three years and the following should be on board as a minimum:

- 4 red parachute rockets
- 4 red hand torches
- 4 white hand torches
- 2 orange smoke signals

### **7.2.6.6 Throw line**

A 15 m to 25 m long floating throw line with throw weight should be lying in the cockpit clear for use.



## 8 Sources

- Investigations by the Water Police (WSP) Heiligenhafen
- Surveys on board by the BSU
- Written comments and oral statements by
  - the skipper, owner
  - co-yachtsmen
  - supplementary comment by the skipper and owner of 31 May 2004 on the draft of the BSU Investigation Report
- Statements by witnesses
- Sea charts and ship's data, Federal Maritime and Hydrographic Agency (BSH)
- Official weather expertise by Germany's National Meteorological Service (DWD)
- Other documents
  - BSH ship files
  - Guide for water sports persons/Safety on the water (BMVBW - Federal German Ministry for Transport, Building and Housing and Development)
  - Safety in sea and coastal area/Rules of care for water sports persons (BSH)
  - Safety Regulations of the Cruiser Department of the DSV (German Sail Association)  
Equipment and safety of sail boats  
Edition 2000/2002