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

Investigation Report 143/11

Very Serious Marine Casualty

Death of a crew member of the sailing yacht SPECIAL ONE on 30 April 2011 off Fehmarn

30 April 2012

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 in the version applicable prior to 30 November 2011.

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

This 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 this Investigation Report.

Issued by:
Bundesstelle für Seeunfalluntersuchung - BSU
Federal Bureau of Maritime Casualty Investigation
Bernhard-Nocht-Str. 78
20359 Hamburg
Germany

Director: Jörg Kaufmann
Phone: +49 40 31908300 Fax: +49 40 31908340
posteingang-bsu@bsh.de www.bsu-bund.de

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1 Summary

At about 1024[1] on 30 April 2011, Bremen Rescue Radio was notified by VHF radio that a person on the German sailing yacht SPECIAL ONE had fallen overboard. The accident occurred en route from Burgtiefe, Fehmarn during a training voyage to the Danish port of Bagenkop (Langeland).
The accident happened at the beginning of the voyage. At the time of the accident, the sailing yacht was located close to the shoreline some 2 nm south of the port of Burgstaaken (Fehmarn).
Problems were experienced with the mainsail due to inattentiveness during a turning manoeuvre. The mainsheet had run out to the mast; the skipper then went on the starboard side and the assistant skipper on the port side forward to the mast to clear the ends of the mainsheet.

While making his way back from the bow, the assistant skipper fell overboard; however, he was still holding onto one end of the sheet and therefore did not lose contact with the sailing yacht. Two or three other sailors were able to keep the man-overboard at the side of the vessel at about amidships by holding onto his hands and the inflated lifejacket. In an attempt to pull him back on board, the lifejacket was pulled upward over the head of the man in the water. When the attempt to haul the casualty on deck amidships failed, he was pulled to the stern, where they tried in vain to assemble a folding bathing ladder, which was not fixed to the hull. The skipper secured himself to the backstay with a safety line/lifebelt and tried to recover the casualty by reaching for his hands from the improperly mounted ladder. One of the ladder's joints broke during this recovery attempt, and the skipper fell overboard, too. Hauling him back on deck proved difficult. During this recovery attempt, the casualty drifted away and in spite of the SPECIAL ONE executing several manoeuvres, it was not possible to re-establish contact with the lifeless person floating in the water.

After the skipper was back on deck, he went below deck, transmitted a distress alert and then used the VHF radio for the distress communications.

The fishing trawler TÜMMLER was near the scene of the accident and became aware of the emergency at 1027 due to the radio traffic. Her crew managed to establish a line connection with the lifeless person floating in the water. However, the crew of the fishing trawler did not manage to recover and lift the body on deck, either. The person was only recovered with considerable difficulty at about 1053 by the crew of the inflatable dinghy belonging to the FEHMARN police boat and then taken to the port of Burgstaaken on Fehmarn. The casualty was pronounced dead by the summoned emergency doctor at the port.

[1] All times shown in this report are Central European Summer Time = UTC + 2

2 SHIP PARTICULARS

2.1 Photo

Figure 1: Sailing yacht SPECIAL ONE

2.2 Particulars

Name of vessel:	SPECIAL ONE
Type of vessel:	Type Salona 45 sailing yacht, charter yacht
Nationality/flag:	German
Port of registry:	Burgstaaken
Call sign:	DD2559
Year built:	2004
Shipyard/yard number:	AD Boats Ltd, Croatia/4531
Length overall:	13.55 m
Breadth overall:	4.20 m
Draught (max.):	2.10 m
Displacement:	13.0 t
Engine rating:	41 kW
Main engine:	Yanmar inboard diesel, Type 4JH3E
Hull material:	GRP
CE marking:	0098, Category 'A-Ocean'
Maximum number of persons:	9 according to Boot Certificate No 1718/09

2.3 Voyage particulars

Port of departure:	Burgtiefe, Fehmarn, Germany
Port of call:	Bagenkop, Langeland, Denmark
Type of voyage:	Other shipping, international Voyage for training and pleasure
Manning:	8
Pilot on board:	No
Canal helmsman:	No
Number of passengers:	None

2.4 Marine casualty or incident information

Type of marine casualty/incident:	Very serious marine casualty, death of assistant skipper
Date, time:	30 April 2011, 1024
Location:	Baltic Sea, south of the island of Fehmarn
Latitude/Longitude:	φ 55°23.50'N λ 011°11.60'E
Ship operation and voyage segment:	Departure, coastal waters
Place on board:	Deck amidships
Human factors:	Yes, human error
Consequences (for people, vessel, cargo, the environment and other):	Loss overboard of the assistant skipper

Excerpt from Nautical Chart 3004, Sheet 5, BSH

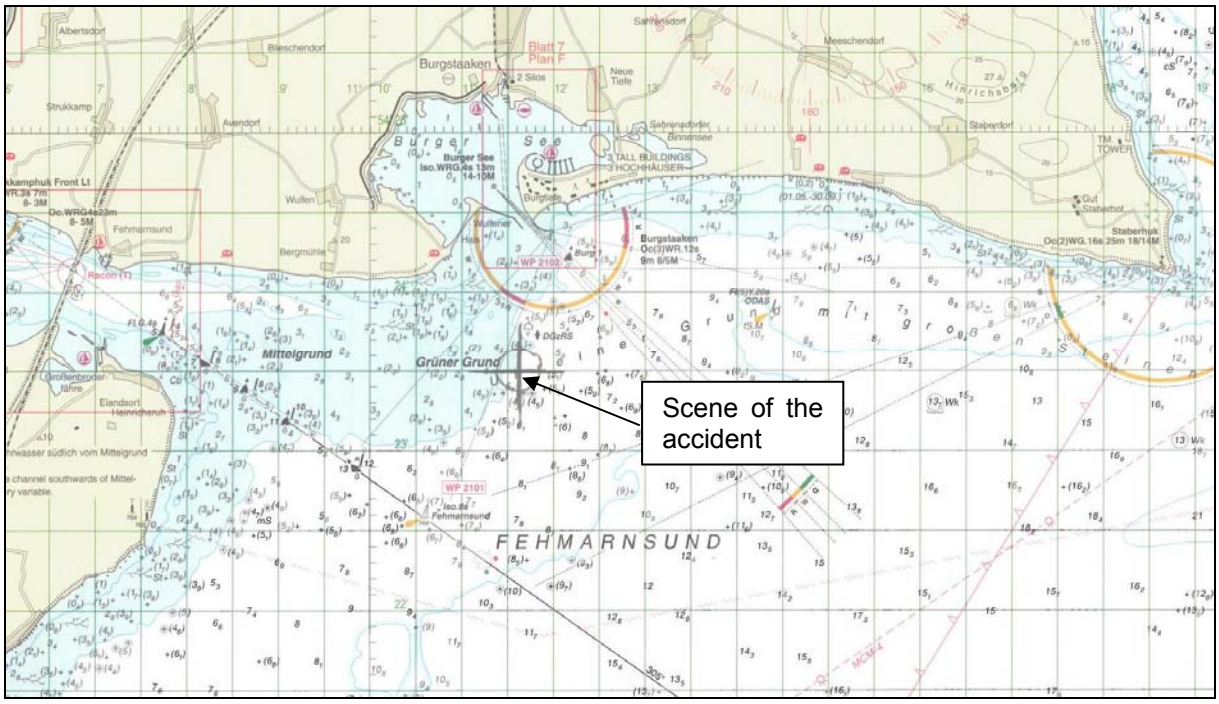


Figure 2: Nautical chart showing the scene of the accident

2.5 Shore authority involvement and emergency response

Agencies involved:	MRCC Bremen Rescue Radio WSP Heiligenhafen
Resources used:	Rescue measures taken on board Rescue attempt by Fishing Trawler TÜMMLER WSP boat FEHMARN and inflatable dinghy for recovery
Actions taken:	Attempt to rescue and recover person
Results achieved:	None

3 COURSE OF THE ACCIDENT AND INVESTIGATION

3.1 Course of the accident

3.1.1 Voyage

The sailing yacht SPECIAL ONE took part in an organised, week-long training and pleasure voyage in the 'Danish South Seas' with seven other yachts. The port of departure and final port of call was Burgtiefe on the island of Fehmarn, with the first scheduled port of call being Bagenkop on the island of Langeland in Denmark.

The voyage planning for the first day at sea involved covering the greatest possible distance under sail and after leaving Lake Burg, from the 'Burg 1' buoy, to continue to the 'Fehmarnsund' buoy before altering course west of the island of Fehmarn and sailing directly for the southern tip of Langeland.

3.1.2 Accident

The account of the course of the accident is based on a summary of the statements of the individual crew members, the entries in the logbook, the recorded radio traffic and other witness testimony.

On 29 April 2011, the yacht was taken over from the charter company by part of the eight-man group, including the skipper and assistant skipper. This involved an inspection of the SPECIAL ONE for completeness of the required equipment and damage. Furthermore, the safety-related equipment was looked at to a certain extent. As the day progressed, the remaining crew members arrived, not all of whom knew one another before the voyage began. Some of the crew members had no experience in sailing yachts or motor yachts at all. Two people were to prepare themselves for the Coastal Vessel Skipper's Licence (Sportküstenschifferschein – SKS-Schein) during the voyage, which was organised by a sailing school, after which they were to take the exam.

The eight skippers held a meeting on the morning of 30 April 2011 on another charter yacht, which was also attended by the skipper of the SPECIAL ONE. At the same time, a safety briefing was given on the SPECIAL ONE for the crew. This was directed by the assistant skipper, but conducted by the two crew members who were to take the exam for the Coastal Vessel Skipper's Licence (Sportküstenschifferschein – SKS-Schein) at the end. The execution of a 'person-overboard'[2] manoeuvre and the options for rescuing a person-overboard were not discussed.

[2] By way of derogation from Order LS 23/62361.14/1 of the BMVBS to the BSU of 08/11/2004, which requires that the term **'person-overboard'** be used in investigation reports and all other publications instead of **'man-overboard'**, parts of the present report also refer to the term that has become established and is also used by seafarers, **'man-overboard'**, as this is also used in the DIN EN ISO 15085 (**Man-overboard** prevention and recovery) standard.

The skipper was not on board during the briefing. After his return, he was informed by the assistant skipper that the briefing had reportedly been carried out satisfactorily.
Immediately after the skipper reboarded, the latest sea state and weather forecast was obtained and they cast off under engine power. The SPECIAL ONE sailed out of the Burgtiefe marina at about 0927. The time sequence was not recorded after that and the times up until the emergency call at 1024 shown below are based on estimates.

After the SY SPECIAL ONE passed the 'Burg 1' buoy, she turned into the wind and the unreefed mainsail was set *(based on the maritime traffic and the fact that remaining stowage work was carried out at a reduced speed, the 'Burg 1' buoy was probably reached at about 0950)*.

All the running rigging on the SY SPECIAL ONE is operated from the cockpit. Here, the mainsheet is routed from the aft winch on the port side on the cockpit coaming over a guide roller on the deck to a second guide roller next to the chainplate, then to a guide roller at the boom head and finally to a guide roller on the floor of the cockpit in front of the steering wheel, and in the reverse order back to the aft winch on the starboard side of the cockpit coaming. There are thus two ends of the mainsheet, which are run on both sides of the vessel on the two self-tailing winches (selftailer[3]).

After the mainsail was set, the sail was prepared for the planned course and a course towards the Fehmarnsund approach was steered, which later made a gybe necessary. During or just after the gybe, about 1 nm after setting the mainsail, the assistant skipper removed the mainsheet from the selftailer in order to ease it. However, he was unable to hold the sheet with his hands and the end, which was not secured by a figure of eight knot, ran out towards the mast up to the block. The assistant skipper then went to the mast on the port side to route this end of the sheet into the cockpit again. He was assisted by the skipper, who also went forward to the mast on the starboard side.

Both skippers wore lifejackets and safety lines; however, these were not attached to the extended lifelines or anything else for personal safety.

Shortly before the assistant skipper reached the cockpit again, he fell – according to the observations of his fellow sailors unexpectedly – overboard *(according to estimates, he probably fell overboard at about 1009)*.

[3] In the case of a self-tailing winch, also called a selftailer, a toothed, conical attachment is on the upper part of a winch. The sheet self-tails when the winch handle is rotated and there is no requirement for a person to take hold of it. Belay clamps or cleats are not required because the conical attachment prevents the sheet from being released; the sheet belays itself, as it were. Only when easing the sheet must it be removed from the attachment and slackened by hand.

A member of the crew immediately went to the radio below deck to transmit a distress alert. Since the 'distress' button on the back of the handset for activating an emergency call was not pressed for long enough, apparently for lack of knowledge, the radio did not transmit; however, this was not realised on board.

The overboard assistant skipper still held onto one end of the sheet, thus maintaining contact with the SPECIAL ONE, and floated with inflated lifejacket amidships on the port side. Helpers on board immediately held him firmly by the hand and tried to pull him on board. While this was happening, the collar of the lifejacket was also grasped, pulled over the head of the casualty in the water and fell overboard. When it was found that it was not possible to pull the approximately 110 kg heavy casualty on board amidships, he was pulled to the stern with a line. However, it was also not possible to pull the casualty upward by his hands at the stern, especially since at this point, the casualty was only capable of actively assisting to a limited extent. An attempt was then made to attach a portable folding bathing ladder to the fittings intended for this at the stern; however, it was not possible to do this properly.
Even after the bathing ladder was attached provisionally, the casualty was unable to put a foot on the bottom rung.
Secured to the backstay with a safety line, the skipper then climbed onto the bathing ladder to pull the motionless casualty upward by means of a better gripping point, e.g., a belt. As the casualty was not wearing a belt, this also failed and the skipper climbed deeper into the water and tried to push with his shoulder. The casualty was already in a state of shock and unresponsive during this recovery attempt. During this final recovery attempt, a bolt on the two-part folding ladder broke, and the skipper also fell into the water, which resulted in loss of contact with the casualty, who drifted away from the SPECIAL ONE *(estimated time about 1022)*.

It was only with difficulty that the crew managed to haul the skipper, whose lifejacket had inflated, was connected by a line and still able to assist actively, back on deck. Back on board, the skipper went below deck and only then, at 1024, transmitted the second distress alert, which was also recorded, and conducted the remaining emergency communications by radio.

While the skipper was conducting the radio traffic, the boom swung back and forth with the mainsail set, causing a crew member to fall onto a winch and suffer a laceration to the head that bled profusely. This injured crew member was treated immediately by a doctor, who was also on board.

In the meantime, the SPECIAL ONE was steered a number of times towards the lifeless casualty floating in the water, but it was not possible to re-establish contact.

The Fishing Trawler TÜMMLER became aware of the accident at 1027 due to the radio traffic on VHF Channel 16.

At about 1044, her crew managed to establish a line connection with the floating person, whose head was now under water. It was also not possible for the FV TÜMMLER to execute a recovery owing to the high freeboard. The casualty was only recovered at about 1055 by the crew of the requested inflatable dinghy belonging to the WSP boat FEHMARN. The casualty was taken to the port of Burgstaaken and death was pronounced there at 1115 by the emergency doctor.

3.2 Investigation

After the accident, the sailing yacht SPECIAL ONE was surveyed by the BSU on 1 May 2011. A general interview was carried out with the crew. This was conducted by WSP Heiligenhafen in more detail at a later date.

Apart from a damaged bathing ladder, no safety-related deficiencies could be found that caused the accident or would have prevented, respectively, obstructed the recovery of the casualty.

It was not possible to determine the exact temporal sequence of events, in particular, how long the rescue attempts took while the casualty was still next to the SPECIAL ONE and responsive.

3.2.1 Manning

The crew of the SPECIAL ONE consisted of eight people, who possessed varying experience and qualifications in relation to recreational craft.

3.2.1.1 Skipper

The skipper has been sailing on recreational craft and offshore yachts for about 20 years. He holds the Certificate for Operating Seagoing Pleasure Craft Sea (Sportbootführerschein See), the Coastal Vessel Skipper's Licence (Sportküstenschifferschein – SKS), the Recreational Sea Skipper Licence (Sportseeschifferschein – SSS), the Recreational Offshore Skipper Licence (Sporthochseeschifferschein – SHS) and the Long Range Certificate (LRC). The certificates of proficiency were issued at different times from 1992 onwards, most recently in 2006 with the award of the SHS. The skipper regularly sailed on voyages spanning several days each year on the Baltic Sea and the Mediterranean. Here, he is engaged as a skipper on charter yachts at no cost by a sailing school within the scope of training or simple holiday trips. People with no experience in relation to recreational craft whatsoever regularly take part in these trips. In the course of his work at the sailing school, the skipper provides training to people wishing to acquire the UBI, SRC or LRC radio certificates.

A breathalyzer test for alcohol carried out on the skipper during the investigation was negative.

3.2.1.2 Assistant skipper (casualty)

The casualty had years of experience in sailing. He was assigned the role of assistant by the skipper for this voyage. His sailing log with a record of nautical miles sailed indicates that he has sailed regularly on the Baltic Sea since 1995 and has been engaged as the skipper responsible on a number of occasions. In addition to the Certificate for Operating Seagoing Pleasure Craft Sea (Sportbootführerschein See), he held the sailing certificates BR and BK.

3.2.1.3 Other crew members

Four crew members were at least in possession of the Certificate for Operating Seagoing Pleasure Craft Sea (Sportbootführerschein See) and had experience in sailing offshore.

One of the four people had passed the theory exam for the Recreational Sea Skipper Licence (Sportseeschifferschein) and was in possession of the UBI, SRC, and LRC radio certificates.

Another person was in possession of the BR certificate as well as the UBI and SRC radio certificates.

Two people had passed the SKS theory exam, were preparing for the practical exam and were in possession of the UBI and SRC radio certificates.

The last two of the eight people were on board a sailing yacht for the first time and had neither experience with recreational craft nor radio certificates.

3.2.2 Weather report

The official report on the wind and sea conditions for the sea area east of Fehmarnsund requested from the Maritime Division of Germany's National Meteorological Service (DWD) contains the following summary.

On 30 April 2011, the accident area was situated on the southern flank of a high pressure system over the northern Norwegian Sea and low pressure systems over the Iberian Peninsula and the western Mediterranean. In good visibility the pressure gradient between the two pressure systems temporarily intensified in the southwestern area of the Baltic Sea in the morning, resulting in an increase in the easterly wind in the accident area.

The weather conditions at about 1000 CEST at the position 54°23.55'N and 011°11.60'E were such that an east to northeast wind of 16 to 19 kts (4-5 Bft) with gusts of 25 to 29 kts (6-7 Bft) prevailed. The wave height stood at 0.5 to 1 m with the proportion of swell, which came from east-southeast, standing at about 0.2 m. The water temperature ranged between 8 and 10°C and the flow came from east at 10 - 30 cm/s (daily average).

3.2.3 Sailing yacht

The sailing yacht is a type 'SALONA 45' series production vessel from the Croatian shipyard 'AD BOATS LTD'.

The yacht was approved for offshore use by means of a CE certificate and for charter use by means of a boat certificate.

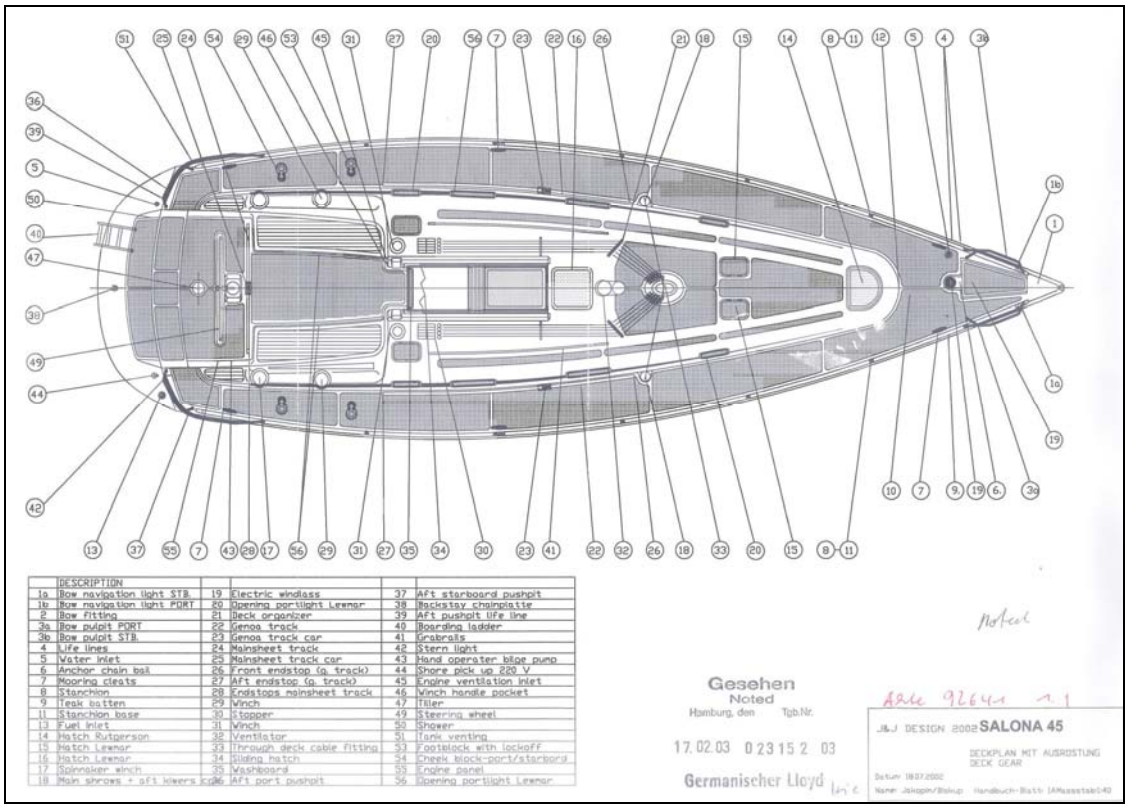


Figure 3: SALONA 45 deck plan

Item 40 of the above deck plan is referred to as 'Boarding ladder'. It is not clear that this concerns a portable bathing ladder or where the stowage position for the bathing ladder should be, nor is the stowage position of the liferaft, which is required on charter yachts, clear.

During the investigation, the visual inspection of the sailing yacht was confined to the points relevant to the accident. In particular, in the present case it was the aft area as this is where the casualty was to be pulled back on board and the area amidships, where the casualty was to be pulled on board first of all.

All the running rigging on board is operated from the cockpit.

Lifelines are permanently mounted on both sides from the fore section to the cockpit as a safety measure if the cockpit has to be vacated in heavy weather. A sufficient number of safety lines were on board, which crew members could use to connect to the lifelines when leaving the cockpit.

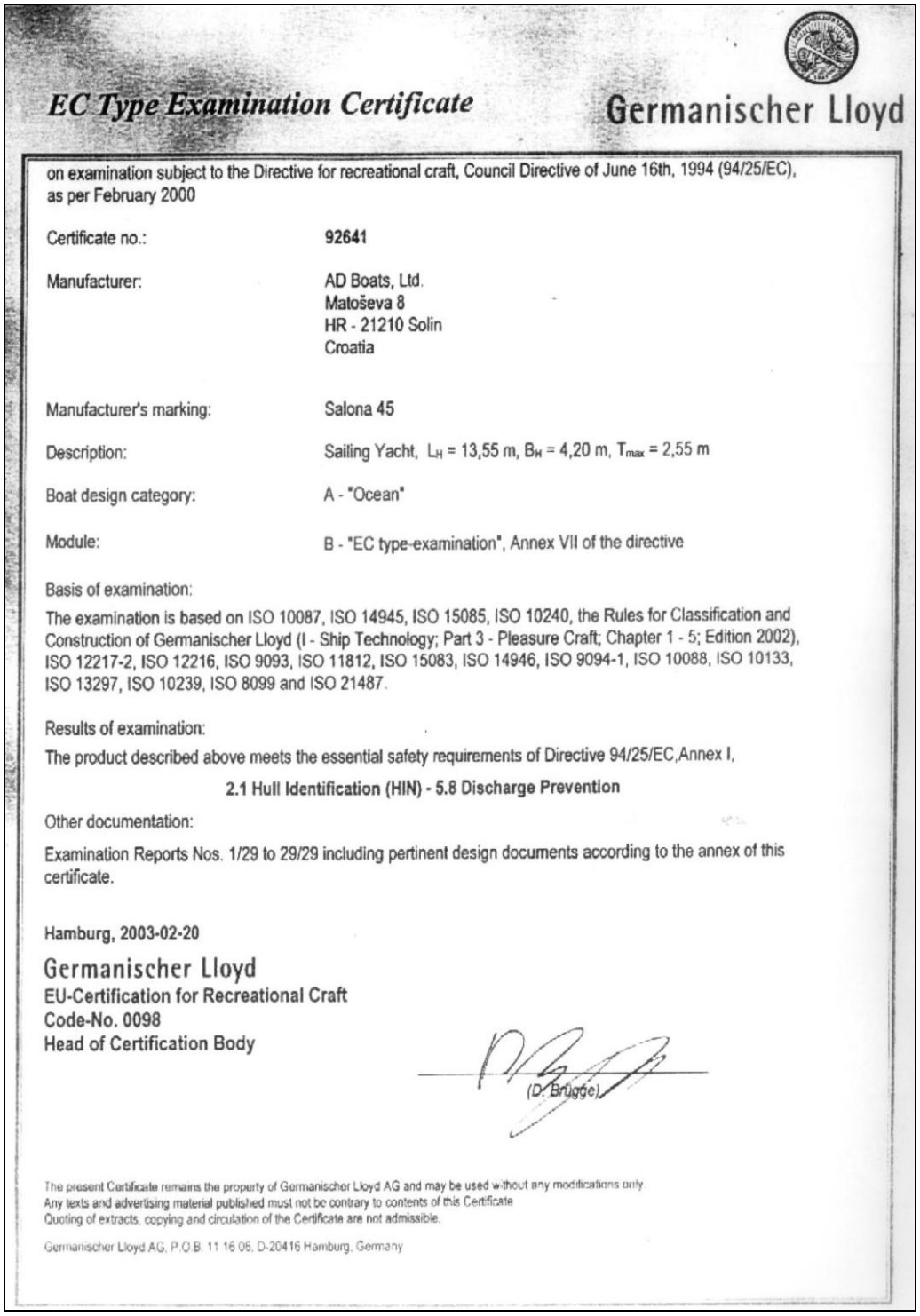
Figure 4: Lifeline (1) on the port side, vessel in Burgtiefe

At the time of the inquiries by WSP Heiligenhafen, the mainsail was down and folded on the main boom. The mainsail halyard was attached and the starboard side lazy jacks on the main boom hung damaged and tangled on the starboard shroud. Most of the mainsheet lay in the area of the starboard winch and was correctly rove in the blocks and guide rollers on the starboard side, while the port side was not completely rove. The roller jib system was attached and ready to sail.

3.2.3.1 Approval by Germanischer Lloyd

In Germany, recreational craft placed on the EC market for the first time after 15 June 1998 must bear the European CE marking before they can be put into operation if their length is 2.5 m to 24 m. The legislative basis for this is Directive 94/25/EC of the European Parliament and the Council of 16 June 1994 on the approximation of laws, regulations and administrative provisions of Member States relating to recreational craft (hereafter referred to as Recreational Craft Directive). This marking must be appended by the manufacturer and confirms that the recreational craft and its components conform to all the basic requirements and assessment procedures laid down in European legislation. This certification was issued for the type 'SALONA 45' sailing yacht by Germanischer Lloyd under Certificate No 92641 and GL Journal No 023152 on 20 February 2003. This certification involved a prototype of the distressed yacht being tested for compliance with the Recreational Craft Directive.

According to the following certificate, the SALONA 45 is certified in accordance with boat design category A – 'Ocean', i.e., for use in a wind force over 8 Bft and significant wave height of 4 m.



EC Type Examination Certificate

Germanischer Lloyd

on examination subject to the Directive for recreational craft, Council Directive of June 16th, 1994 (94/25/EC), as per February 2000

Certificate no.:	**92641**
Manufacturer:	AD Boats, Ltd. Matoševa 8 HR - 21210 Solin Croatia
Manufacturer's marking:	Salona 45
Description:	Sailing Yacht, L_H = 13,55 m, B_H = 4,20 m, T_{max} = 2,55 m
Boat design category:	A - "Ocean"
Module:	B - "EC type-examination", Annex VII of the directive

Basis of examination:

The examination is based on ISO 10087, ISO 14945, ISO 15085, ISO 10240, the Rules for Classification and Construction of Germanischer Lloyd (I - Ship Technology; Part 3 - Pleasure Craft; Chapter 1 - 5; Edition 2002), ISO 12217-2, ISO 12216, ISO 9093, ISO 11812, ISO 15083, ISO 14946, ISO 9094-1, ISO 10088, ISO 10133, ISO 13297, ISO 10239, ISO 8099 and ISO 21487.

Results of examination:

The product described above meets the essential safety requirements of Directive 94/25/EC,Annex I,

2.1 Hull Identification (HIN) - 5.8 Discharge Prevention

Other documentation:

Examination Reports Nos. 1/29 to 29/29 including pertinent design documents according to the annex of this certificate.

Hamburg, 2003-02-20

Germanischer Lloyd
EU-Certification for Recreational Craft
Code-No. 0098
Head of Certification Body

(D. Brügge)

Figure 5: GL Certificate

2.3 Protection from falling overboard and means of reboarding of the Recreational Craft Directive states that depending on the design category, craft shall be designed to minimise the risks of falling overboard and to facilitate reboarding. This is not referred to in an owner's manual required under the Recreational Craft Directive; however, it is in the relevant ISO standards, e.g., DIN EN ISO 15085, on which the CE test is based and which is listed in the above GL Certificate.

3.2.3.2 Approval as a charter vessel

According to art. 5 of the Recreational Craft Ordinance Sea (See-Sportbootverordnung – SeeSpbootV), recreational craft that are hired out commercially must carry a boat certificate on board, which has been issued by a waterways and shipping authority (WSA) following an inspection. WSA Lübeck, which is responsible for the berth and seat of the company, commissioned Germanischer Lloyd with a survey of this recreational craft. At the time of the accident, the boat certificate was only valid until 16 April 2011. A survey/repeat inspection had already been carried out without adverse findings by a GL surveyor on 7 April 2011. This acceptance certificate, with a certificate of inspection from GL valid for three months, was kept on board. The boat certificate is usually issued formally by WSA Lübeck with a delay of up to three months due to staff shortages. Therefore, the certificate was not issued by WSA Lübeck until 6 July 2011, with an expiration date of 7 April 2013.

The boat certificate pursuant to art. 5 SeeSpbootV only permits chartering of recreational craft without a skipper for private sport and recreational purposes. At the time of the accident, people were being trained on the SY SPECIAL ONE for the Coastal Vessel Skipper's Licence (SKS-Schein) and the boat certificate does not cover such commercial use of a recreational craft. Within the period for consultation in accordance with art. 15 SUG in conjunction with art. 17 FIUUG, the Ship Safety Division (BG Verkehr) points out the following:

"According to art. 14 SeeSpbootV, a recreational craft may be used commercially only if it has a safety certificate from the See-Berufsgenossenschaft (now Ship Safety Division – BG Verkehr) within the meaning of art. 9 III in conjunction with art. 15 I (2) SchSV[4] 98 and complies with the remaining requirements of the Ordinance for the Safety of Seagoing Ships. The Directive on safety requirements for recreational craft used commercially for training purposes in accordance with art. 52 a SchSV (86) (Directive for training vessels) of 25/08/1997 must be applied analogously for recreational craft used commercially for similar sport and recreational purposes within the meaning of art. 2 (6).
Accordingly, as a training vessel with a length of 13.55 metres, the SY SPECIAL ONE would have required certification according to art. 52 a I SchSV (86).
This also applies to recreational craft that are bareboat chartered, but used by the charterer commercially. Reference is made to the Order of the Hamburg Higher Administrative Court of 8 December 2010 (1 Bs 181/10, 'Cementesse')."

This absence of a safety approval as a training vessel in accordance with the SchSV was not the cause of the accident; therefore, it has not been addressed further in this investigation report by the BSU.

3.2.3.3 Guardrail, freeboard, aft section and bathing ladder

The following information and measurements were taken on 1 May 2011 when the SPECIAL ONE was moored equipped ready for the voyage in the port of Burgtiefe and certain crew members and investigating officers of the WSP were still on board.

[4] SchSV = Ordinance for the Safety of Seagoing Ships

The measured freeboard on the port side level with the mast was 1.15 m. The height of the guardrail on the port side was measured at 60 cm and the first deflecting force was 30 cm above the deck. Anomalies or damage that triggered or were caused by the accident were not discovered. The guardrail sheathing in the area of a stanchion was no longer present. Typically, the wire is completely encased, or not all. The wire on racing yachts may not be encased so that hidden damage and corrosion are easier to detect.

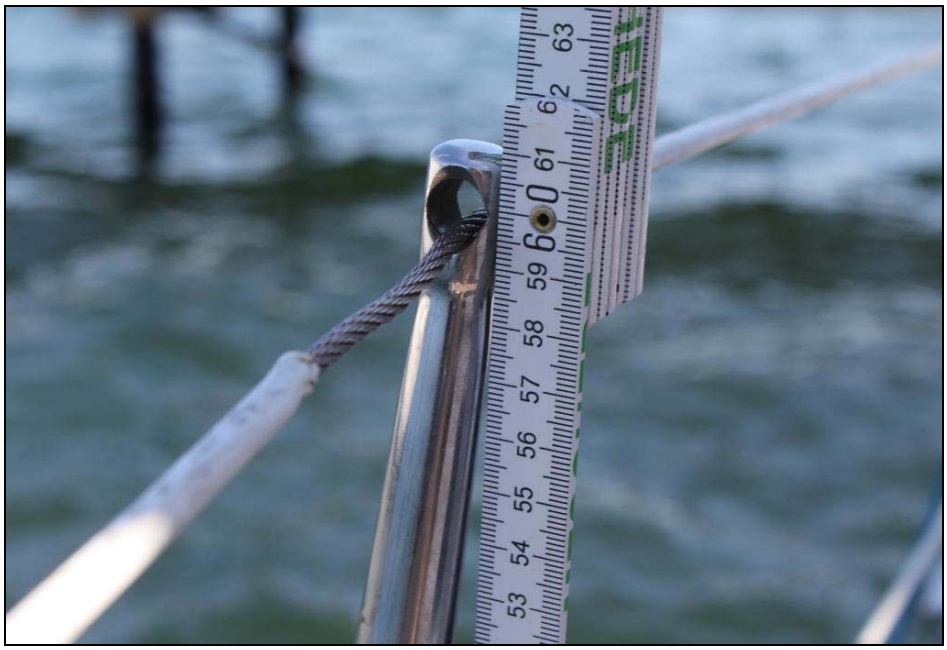


Figure 6: Guardrail on the port side

The area marked bathing platform (shower) at the stern is actually the continuous cockpit deck, which is interrupted by a locker transversely mounted behind the steering wheel. The passable area on the bathing platform is approximately 2.55 x 0.44 m and the height from the water surface was measured at 0.80 m. Two fittings with hole and slot are mounted on the port side of this area. These are used for attaching the bathing ladder, which is suspended from above and should be secured against slipping out by two knurled thumb wheels.

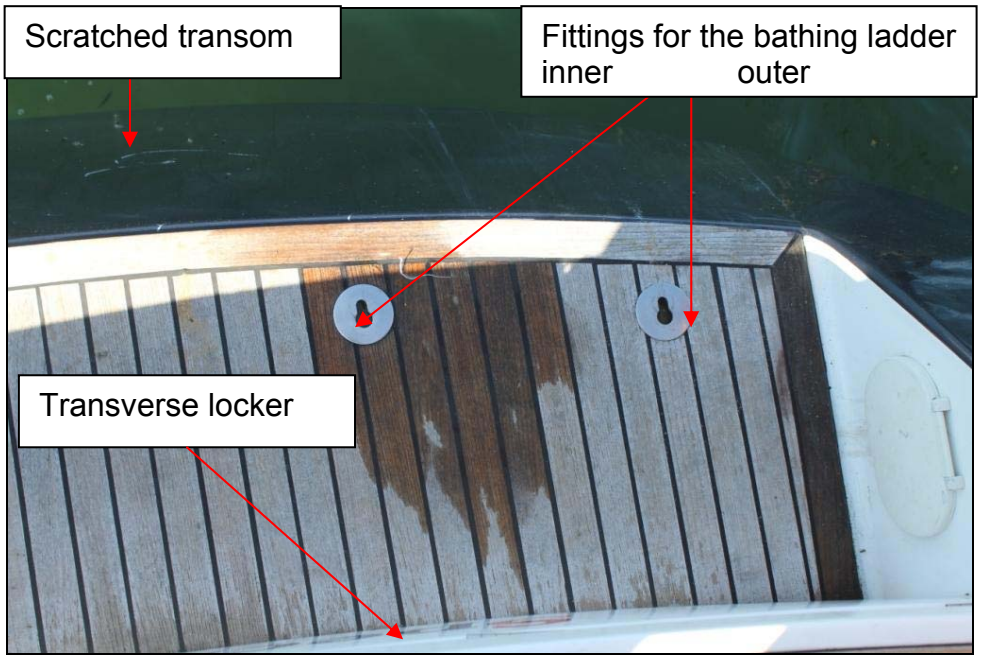


Figure 7: Bathing platform from above

According to statements given, it was not possible to insert the ladder into the outer fitting on the day of the accident because the bathing ladder's inner knurled thumb wheel could not be loosened and its pin could not be secured in the fitting. There are also statements that indicate that the bathing ladder was not inserted into the outer fitting because a member of the crew, who had to keep hold of the casualty, was standing on it. The bathing ladder was then mounted in a very unstable manner by inserting the outer pin with knurled thumb wheel into the inner fitting and the inner side was tied to the backstay for stabilisation by means of a thin line.

Another crew member stated that it was likely that the bathing ladder was not inserted in either fitting.

However, in contrast with the latter statement, at the time of the inquiries by the WSP in Burgstaaken, the ladder was inserted only with the inner pin into its intended fitting on the bathing platform and tied to the backstay with a thin blue line (see next photo).

Figure 8: Photo of the vessel taken by the WSP on the day of the accident

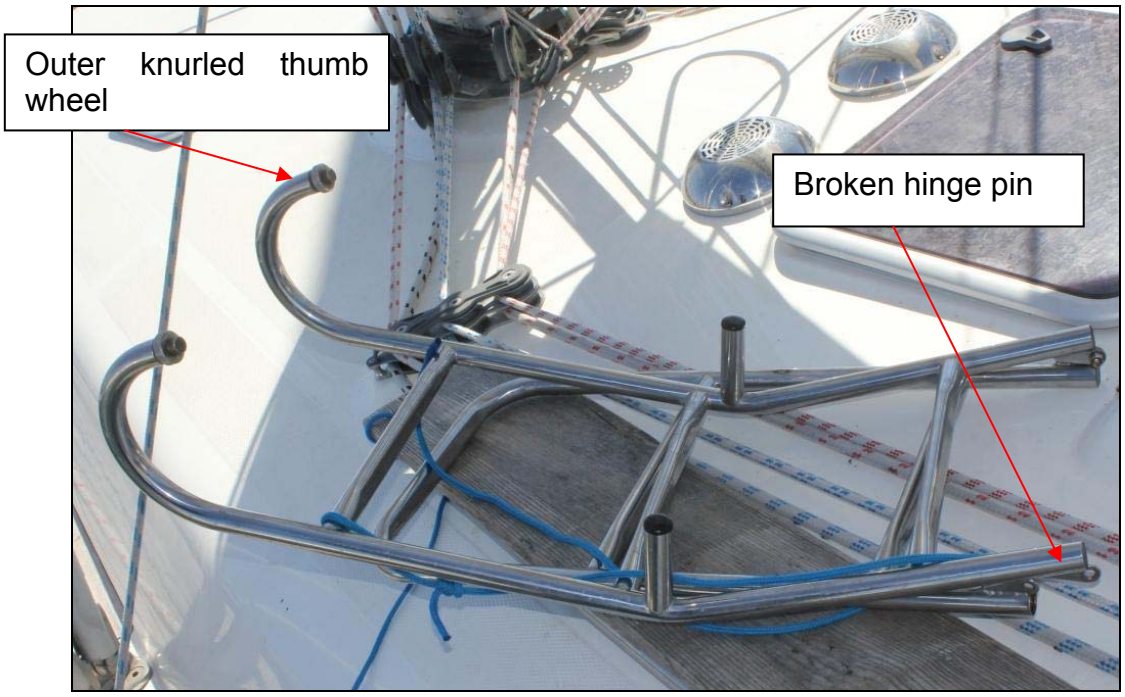


Figure 9: Photo of the bathing ladder taken by the BSU on the day of the accident

During the survey by the BSU in Burgtiefe one day after the accident, the bathing ladder was lying on the port side of the deck. The joint located on the inner side of the ladder was no longer intact as the pin was missing. The two knurled thumb wheels on the ladder could be moved by hand, but were a little stiff.

Fresh scores were detected in the teak on the bathing platform and also in the gelcoat on the transom, which were apparently caused by the bathing ladder slipping. The evidence suggests that at the time of slipping, the ladder was not secured in the fittings on the bathing platform by either of the two pins.

The unfolded ladder had a total length of 1.60 m and when properly inserted there were three rungs down to about 0.70 m below the water surface.

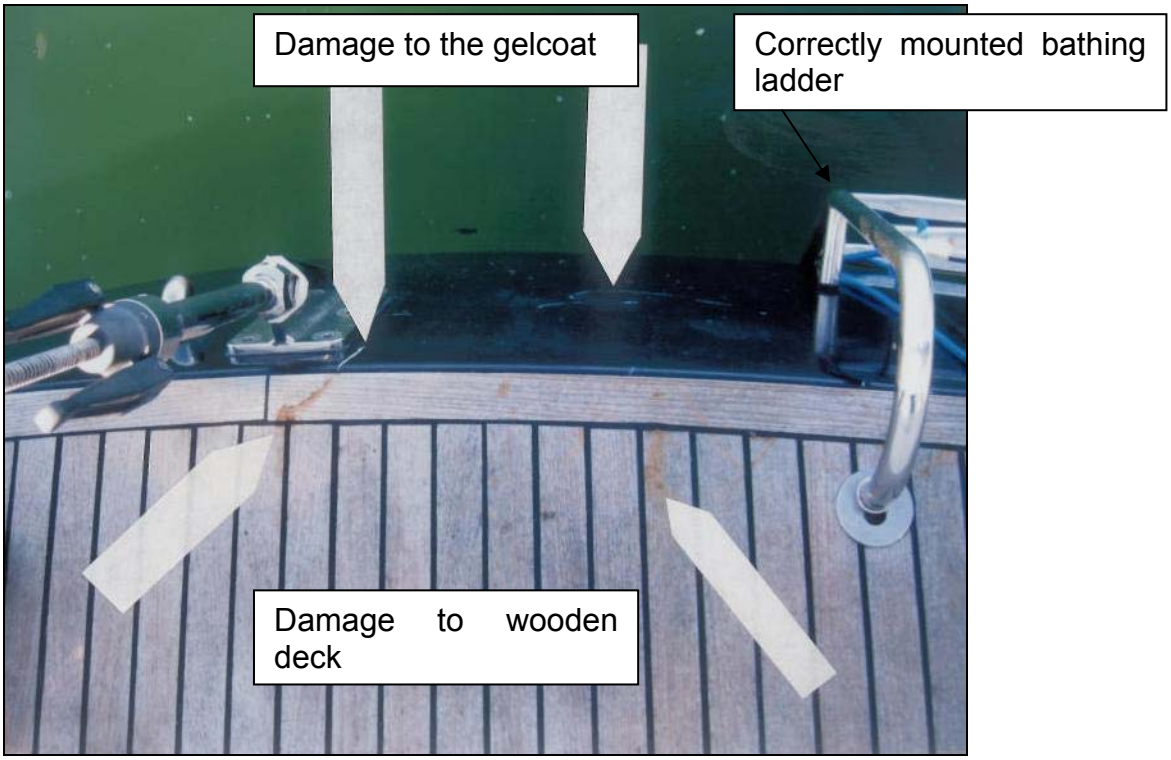


Figure 10: Damage to wood and gelcoat

3.2.3.4 Safety equipment on board

The following safety equipment, which was serviceable and could be used in a recovery, was on board at the time of the investigation:

- buoyant rescue/recovery belt with 40 m of buoyant line, type Talamex Rescue System, mounted on the aft guardrail (port side);
- horseshoe-shaped buoyancy device with buoyant signal light, type Lalizas Horseshoe M.O.B.; rescue system mounted on the aft guardrail (starboard side)
- type ARIMAR INT 10 liferaft stowed behind the helm in the transverse locker;
- one boathook with a total length of 1.75 m and working length of 1.60 m.

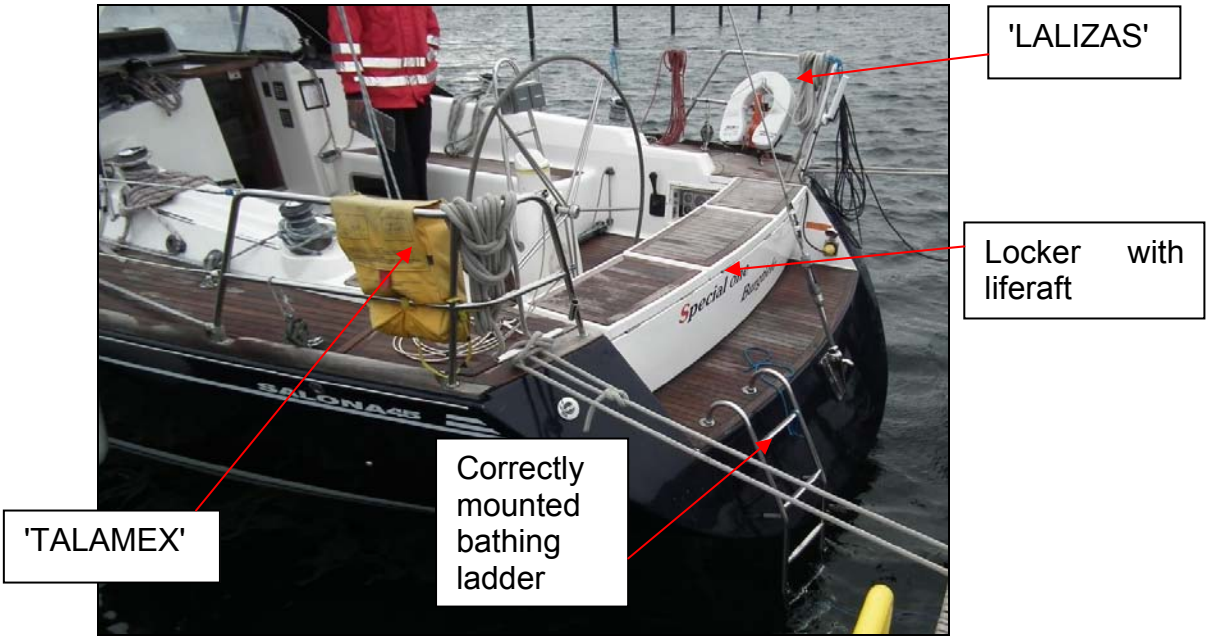


Figure 11: View of the stern taken from aft

3.2.3.5 Radio

A type 'Ray 240E VHF' VHF marine radio is installed below deck on the starboard side at the navigation station. Amongst other things, the radio channel is selected and the volume of the internal speaker adjusted using the connected handset. The transmit button is on the side and the release button for the distress alert on the back of the handset.

Figure 12: Handset

To operate the distress alert, a transparent plastic cover must be actively pushed upward. A clearly visible red button labelled DISTRESS in white letters is located below that. The red button must be pressed for five seconds to trigger the distress alert.

When this button is pressed for long enough, an indication that the distress alert has been sent is shown on the display. Furthermore, audible confirmation is sounded and the system switches to Radio Channel 16 automatically.
An additional external speaker is connected to the marine radio. The external speaker is located on the roof of the cabin and at the time of the investigation, the volume control was set at full volume. With this volume setting, the audible confirmation of the first distress alert should have been heard in the cockpit if the release button for the distress alert was operated properly.

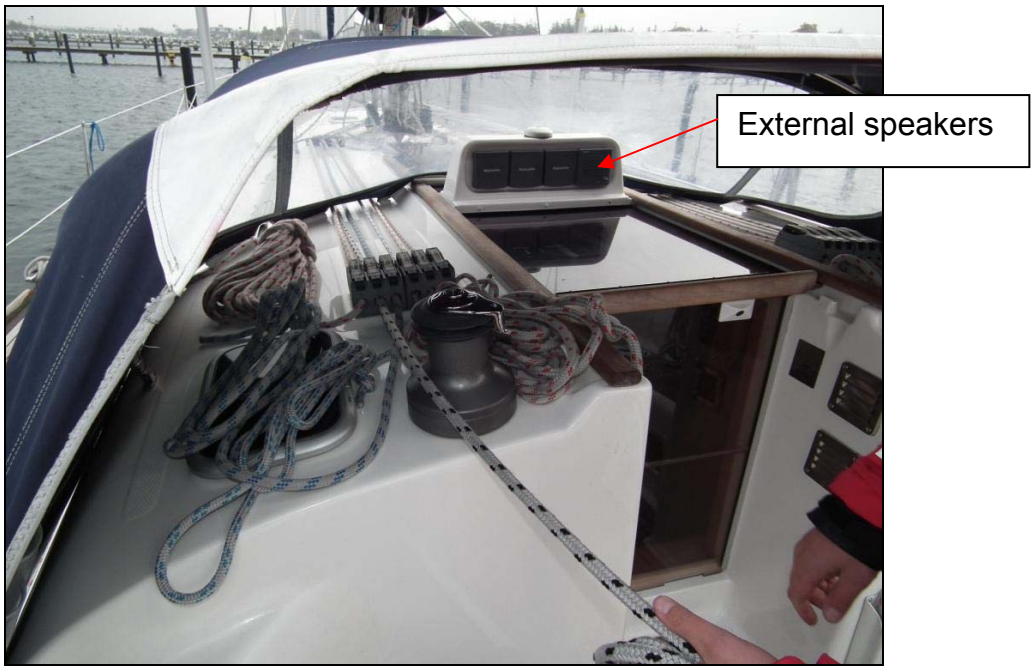


Figure 13: View of the instruments outside

3.2.3.6 Lifejacket

According to corresponding witness statements, the casualty was wearing a lifejacket and a safety belt at the time of the accident. The lifejacket was a type Alterna AL automatic jacket made by KADEMATIC. The specified buoyancy force of this jacket is 150 newtons and it conforms to DIN EN ISO 12402.

The jacket was secured by WSP Heiligenhafen and was fully inflated. An inspection label from the company KADEMATIC, which was affixed to the jacket, indicated that the next test date was due on 03/2013. The safety pin for manual release mechanism was still there, and the automatic inflation activated.

The abdominal belt was set to maximum width.

A safety line was attached to the lifejacket by means of a snap hook in the jacket's D-ring. This safety line was passed through the belt marked 'LIFT' sewn onto the inside of the buoyancy device.

Damage was found on neither the lifejacket nor the safety line.

Figure 14: Lifejacket worn by the casualty with safety line

When interviewing the crew of the SY SPECIAL ONE, nobody was able to explain the meaning of the designation 'LIFT' adequately.

Furthermore, none of the crew members knew that the lifejackets on board had such a recovery strap or that the recovery strap designated 'LIFT' can be used to pull a person out of the water.

This lifejacket did not have a crotch strap, which could have prevented it from being pulled over a person's head.

4 ANALYSIS

This fatal person-overboard accident was the result of the mainsheet not or no longer being secured by means of a figure of eight knot. The mainsheet ran out to the mast, after which people had to leave the cockpit to re-establish its seaworthiness.

Despite wearing a lifejacket and safety line, the casualty did not connect to a lifeline or anything else and fell overboard. The ensuing rescue manoeuvres and alerting of other emergency services were not coordinated. A portable bathing ladder, approved for this yacht as a reboarding device according to DIN EN ISO 15085, was not practicable. Valuable time was lost during the installation of this bathing ladder and subsequent attempt to rescue the person via this means. The crew did not use all the other recovery equipment available on board and the final outcome was death by drowning.

4.1 Manning

Of the remainder of the crew on board, which consisted of seven people, five people should have been capable of overcoming challenging situations such as a man-overboard manoeuvre and recovery by virtue of their existing experience and successfully completed training.
In summary, the course of the rescue is as follows:

- person secured at the side of the vessel;
- crew member instructed to transmit a distress alert;
- attempts made to pull the person amidships on board only by manual force;
- person guided to the stern on a line;
- attempt made at the stern to pull the person out of the water via a bathing platform;
- provisional attachment of a bathing ladder;
- attempt to pull the person on board via the bathing ladder;
- second person descends into the water to establish a better grip, respectively, push the casualty on board by applying pressure.

A muster list was not discussed on board the SPECIAL ONE and provisions for who should do what in an emergency were not made. Certain crew members described the entire rescue operation as being somewhat chaotic and unplanned.

A safety briefing on board was not carried out by the skipper responsible, but by members of the crew, who were to take their practical SKS exam. A check as to whether all the safety-related issues had been addressed and whether all the crew members – especially the two on board with no experience – had taken in and understood the issues, was not evaluated by the skipper.

The recovery facilities available on board were not sufficiently utilised. To rely on a non-qualified person to implement the distress alert at the beginning appears critical. Moreover, it did not lead to the desired effect.

4.2 Yacht and safety equipment

In principle, the yacht was capable of sailing in the wind and sea conditions mentioned. The SPECIAL ONE had all the required safety equipment on board and was approved for charter service by an appointed surveyor. Furthermore, the equipment complied with the recommendations of the Safety Guidelines of the Cruiser Section of the German Sailing Association e.V. and the minimum equipment set out in the 'Safety on the Water' ('Sicherheit auf dem Wasser') brochure of the BMVBS[5].

A 'bathing platform', which is designed as an extension of the cockpit, corresponds to the present day standard. The bathing platform's dimensions and characteristics are typical for a yacht with this type of stern. The bathing platform on such yachts is only marginally or not at all suitable for using as a position from which a rescue operation can be carried out or for assisting in one. First, the size of the standing area does not permit working when knelt down; second, the distance to the water surface is still very large (see following figure).

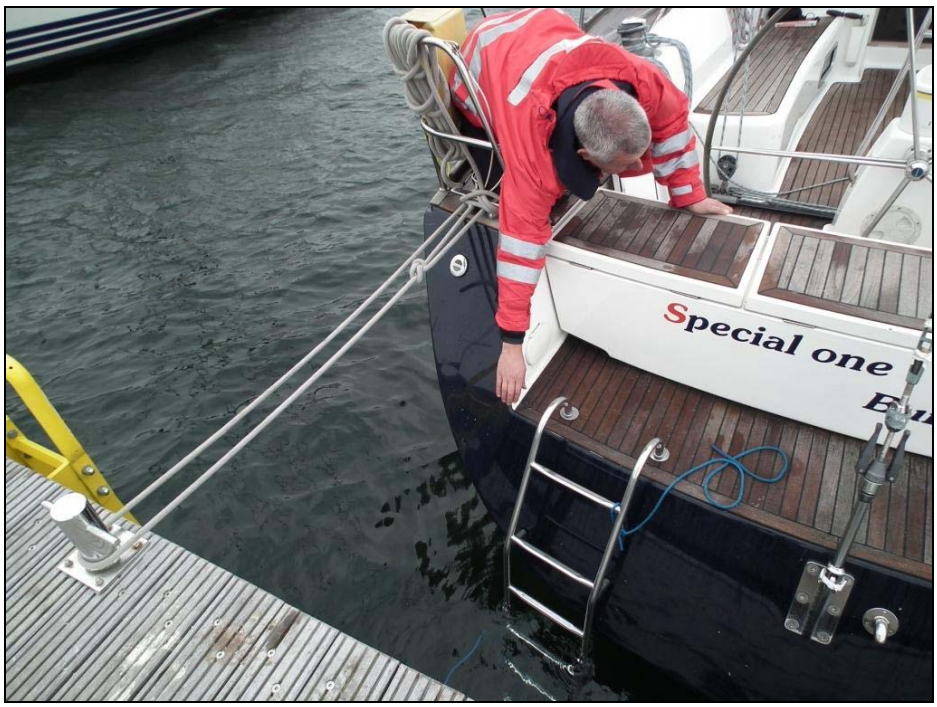


Figure 15: Providing assistance from the stern

However, since such ladders are usually fixed permanently to the hull, a bathing ladder not permanently fixed to the hull does not conform to the present day standard on yachts of this size. With that being said, the bathing ladders fixed permanently to the hull serve their purpose as a so-called 'reboarding device' only to a limited extent. For people who are weak or slightly overweight, climbing such ladders, the steps of

[5] BMVBS – Federal Ministry of Transport, Building and Urban Development

which only reach a little way below the surface, is difficult to virtually impossible. As demonstrated by the accident, inflated lifejackets complicate saving oneself or providing assistance in a recovery operation further. Added to this is the fact that in even poorer sea conditions, the stern of such a yacht represents a significant potential risk due to pitching.

4.2.1 Recovery equipment for man-overboard manoeuvres

Different names and terms are used for recovery equipment in different rules, standards and laws, which ultimately relate to the same recovery equipment.

DIN EN ISO 15085 refers to '**Reboarding Device**' in relation to the recovery equipment, Annex 1 – Boat Certificate (Sea) – to the Recreational Craft Ordinance Sea (See-Sportbootverordnung) uses '**Embarkation Ladder**' and Annex 3 – Acceptance Certificate for Recreational Craft and Personal Watercraft, with reference to the Safety Guidelines of the Cruiser Section of the German Sailing Association e.V., '**Safety Ladder**'. The descriptions of the recovery equipment in these documents are rather vague and not precisely formulated. The prevailing opinion here is that the recovery equipment currently installed on CE approved yachts does not appear to be fit for purpose in terms of recovering exhausted or helpless people from the water.

4.2.1.1 DIN EN ISO 15085

According to Directive 94/25/EC of the European Parliament and the Council of 16 June 1994 (Recreational Craft Directive), all yachts put into operation in EU waters after 1998 must be officially certified. This certification was carried out for the Salona 45 yacht by Germanischer Lloyd in 2003. DIN EN ISO 15085 'Small craft – Man-overboard prevention and recovery' forms part of the scope of certification.

EN ISO 15085:2003 applied from April 2003 onwards with the amendment EN ISO 15085:2003 + A1:2009 also applying from May 2009 onwards. Point 3.17 – Reboarding device and Point 5 – Safety device are identical in both.

Point 3.17: **Reboarding device**

= "Fixed or movable component or part of the hull that enables a person to reboard without assistance"

Point 5: Table 2 – List of safety equipment

According to 9 para. 16 of this EN ISO standard, a reboarding device must be considered, which is ***required on every vessel***

In para. 16, several notes were added to the revised EN ISO 15085:2003 + A1:2009. Introductorily:

Point 16.1: General

"Every vessel must be equipped with a means of reboarding. Either a) she must be equipped with specific means of reboarding from the water, for example, ladders, steps, handrails, stanchions, etc., or b)[...]"

These requirements for "specific means of reboarding" are clarified in

Point 16.2:

*"**If not permanently installed**, specific means of reboarding must be quickly accessible and deployable without the use of tools. If present, one single person must be able to use the provision without assistance; [...]"*

Point 16 of the previous version of EN ISO 15085:2003 stated:

*"These reboarding devices must be easily accessible and usable without the assistance of someone on board the vessel **if they are mounted**. (Note: "easily accessible" means accessible quickly and without tools.) "*

In this last point, the two standards differ between "if not permanently installed" and "if they are mounted."

Furthermore, in the preceding standard the reboarding devices should also be described in an owner's manual; this has now been reformulated:

Point 16.3 General information that must be included in the owner's manual:

"For each vessel, the procedure for reboarding must be described in the owner's manual."

The procedure for recovering a person was not discussed during the safety briefing on board and the owner's manual, in which the procedure for reboarding is described, was evidently not on board and also not known to the skipper.

The charter company and Germanischer Lloyd are in possession of a manual from the shipyard entitled 'Manual for owners and skippers', which is evidently the only manual that exists in accordance with DIN EN ISO 15085 for the skipper. In this 64-page 'Manual for owners and skippers', a bathing ladder is depicted on the stern of the vessel in several drawings; however, it is not apparent from the drawings and also not specified that this is a portable bathing ladder. Neither the stowage position of the bathing ladder or that of a liferaft, nor the procedure for reboarding are described.

Therefore, the manual does not fulfil the requirements of an owner's manual according to DIN EN ISO 15085.

The detachable, not permanently mounted bathing ladder that was present on board, which, inconveniently, first had to be obtained from a locker and led to considerable difficulties when being mounted in a confined space, does not meet the requirements of DIN EN ISO 15085. At a wind force of 8 Bft and significant wave heights of 4 m – in accordance with the yacht's certification – it would probably be almost impossible to mount this bathing ladder.
Assuming the time specified for mounting the bathing ladder would be the same as the specification for the operational readiness of liferafts (15 seconds), then it must be concluded that it is impossible to adhere to the specified time even with functioning knurled thumb wheels.

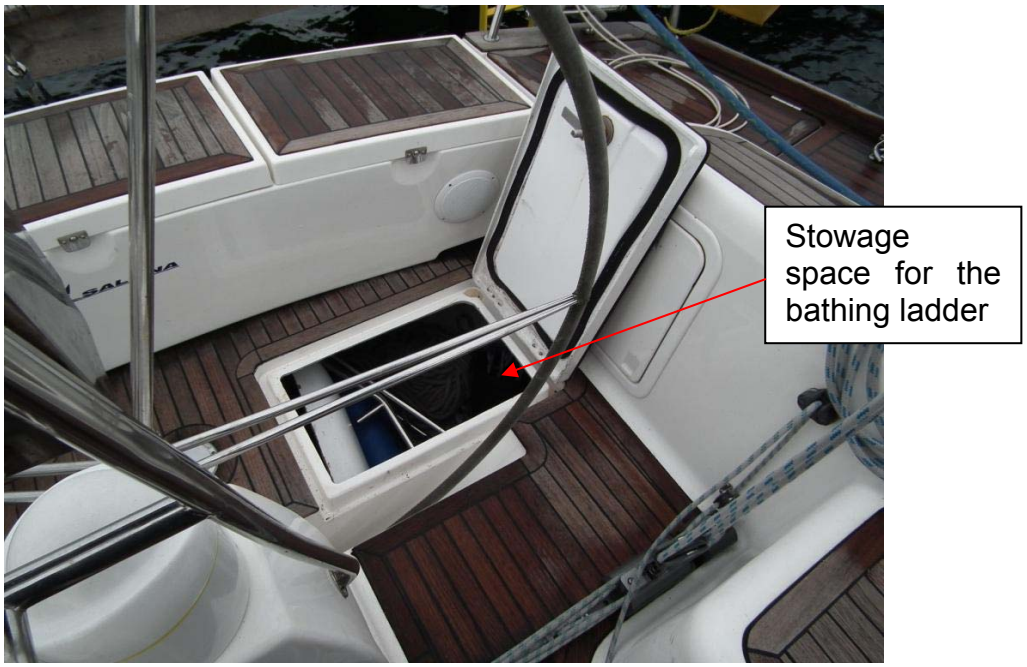


Figure 16: Stowage space for the bathing ladder

4.2.1.2 Recreational Craft Ordinance Sea (See-Sportbootverordnung)

In addition to providing for CE marking, the regulation on the commissioning of recreational craft and personal watercraft as well as the chartering and commercial use thereof in coastal areas (Recreational Craft Ordinance Sea – SeeSpbootV) also covers chartering commercially used recreational craft.
According to art. 5 para. 1 SeeSpbootV, a required boat certificate with 2-year validity and a table with minimum equipment according to Annex 1 are prescribed.

Point 25 of Annex 1, Minimum Equipment, includes the equipment:

'Embarkation Ladder'

In art. 6 para. 1 (3), the scope of examination is defined according to Annex 2. In this Annex 2, the testing of recovery equipment is not prescribed under Safety Equipment.

The last sentence of this Annex 2 reads:

"The minimum equipment that must be prescribed in the boat certificate is based on the latest version of the Safety Guidelines of the Cruiser Section of the German Sailing Association."

The last sentence of art. 6 para. 2 reads: "The scope of examination must comply with the requirements of the regulatory authority with due regard to the acceptance certificate set out in Annex 3." Point '3.6 Safety Equipment' under 'Requirements in accordance with the Safety Guidelines of the Cruiser Section' of this Annex 3 states:

"Safety Ladder (12.7[6])"

4.2.1.3 Safety guidelines

The Safety Guidelines – Equipment and Safety of Sailing Yachts/Multi-hull Boats – of the Cruiser Section of the German Sailing Association e.V. are international and national guidelines for the minimum safety equipment and facilities of seagoing sailing yachts based on the Special Regulations of the Offshore Racing Council (ORC), as amended November 1999. 12.7 of the Safety Guidelines of the Cruiser Section of the German Sailing Association, Edition 14 dated 05/10/2000 (latest edition) reads:

12.7 "Heaving line with a minimum length of 15-25 m readily accessible to the cockpit.

f) The heaving line should be equipped with a float and casting weight.

g) Additional equipment:
Appropriate recovery equipment for 'man-overboard'.

The very serious marine casualty involving the SPECIAL ONE has shown that a bathing ladder, which, inconveniently, must first be obtained from a locker and mounted, cannot be regarded as appropriate recovery equipment. Moreover, a bathing ladder can only be viewed as appropriate recovery equipment for man-overboard situations if the persons floating in the water are still physically capable and strong enough to climb such ladders without assistance. Reboarding with an inflated lifejacket suspended in front of the body in swell represents a significant problem for ordinary people and would probably be impossible for somebody who was exhausted.

[6] 12.7 in Annex 3 relates to Point 12.7 – Safety Equipment of the Safety Guidelines of the Cruiser Section of the German Sailing Association.

4.2.2 Other recovery equipment

After the attempt to haul the casualty on board just by pulling failed amidships, the crew of the SPECIAL ONE focused exclusively on hauling the person in the water on deck at the stern via the bathing ladder.

The remaining recovery equipment on board for man-overboard situations was not used; similarly, no attempt was made to haul the person in the water back on board by means of one of three vacant and unused halyards on the mast and via the winches.

4.2.2.1 Life preserver located aft on the starboard side

A horseshoe-shaped life preserver, type LALIZAS Horseshoe M.O.B. Rescue System, which could have assisted the casualty as a buoyancy aid when he was no longer wearing a lifejacket, was located on the starboard side. The disadvantage of this life preserver would have been that a line was not attached to it, meaning there would no longer be a connection with the vessel.

Figure 17: Life preserver on the starboard side

4.2.2.2 Rescue system located aft on the port side

An ideal rescue system with a line of approximately 40 m was located aft on the port side in the form of the TALAMAX Rescue System; however, this was not used to get the person out of the water.

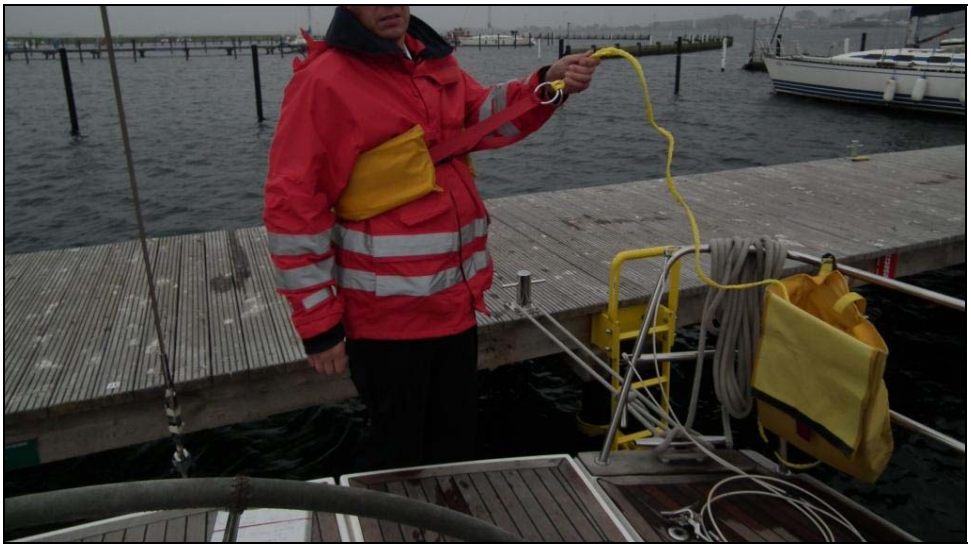


Figure 18: Rescue system on the port side

4.2.2.3 Liferaft

A liferaft (bag design) for 10 people was stowed in a locker behind the helmsman. When packed, the dimensions of this bag are 74 x 31 x 38 cm and the weight is 36 kg. The stowage space for liferafts is dealt with by 12.4 et seq of the Safety Guidelines of the Cruiser Section of the German Sailing Association. This states that the liferafts on a vessel built after 2001 should be stowed on the working deck or in compartments that open towards the working deck and contain only liferafts. It must be possible to move a liferaft to the guardrail within 15 seconds.

Certain statements indicate that the liferaft was taken out of the cramped locker with difficulty and made ready on the deck. When it was clear that physical strength alone and the high freeboard would not permit hauling the casualty back on board, the liferaft – with its low freeboard – should have been deployed.

4.3 Lifejacket

All the people on board wore lifejackets that were not furnished with a crotch strap. The casualty also had a safety line on the front D-ring; however, he did not hook this to the lifeline located on deck. The lifejacket inflated automatically upon contact with water.

The crew was not aware that the jacket had a recovery strap. To haul a person back on board by means of this strap, active assistance is usually needed when putting on.

Due to the absence of a crotch strap and the fact that the casualty also held up his arms to pull himself up on the guardrail, the lifejacket was inevitably tugged over the head of the person in the water while it was being pulled.

The skipper's subsequent efforts to rescue and recover the casualty were severely impeded by his own inflated lifejacket.

4.4 Mainsheet routing

The mainsheet routing on board the SPECIAL ONE is a so-called 'German Mainsheet System' (or 'German Sheet System'). In the case of this sheet routing, which at one time was often used on gaff yachts as well as on Swedish skerry cruisers, for example, the sheet consists of two loose ends.

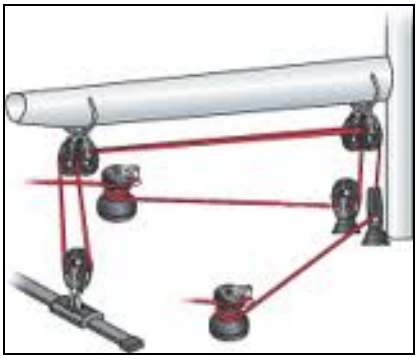


Figure 19: Mainsheet routing

The sheet on board the SPECIAL ONE was routed from a winch via guide rollers to the mast and boom head and then via a guide roller on the traveller track back to a winch on the other side of the vessel, as shown in the above drawing. The advantage of sheet routing of this nature is that the mainsheet can be operated on both sides by two winches, depending on which is more favourable or easier to reach. However, the disadvantage is that two ends of the sheet must be secured and that if one side is continuously eased and the other permanently close hauled, at some point the entire sheet will be on one side of the vessel, upon which it will not be possible to ease the other side.

The winches on the SPECIAL ONE are self-tailing and there are no additional deck clamps or other cleats available for securing the mainsheet.

According to the statements given, it is doubtful that all the experienced crew members on board the SPECIAL ONE were familiar with this sheet routing as only one person had sailed on vessels with this type of sheet routing hitherto.

4.5 Investigation of other yachts

As part of the marine casualty investigation relating to the person-overboard accident involving the SPECIAL ONE, the reboarding devices and mainsheet routing of other yacht types were examined.

The non-representative survey at the Boot Düsseldorf 2012 exhibition of a total of 82 yachts of 30 to 50 feet in length, which were built by 30 shipyards, revealed that 74 yachts, respectively, 90%, are fitted with a fixed bathing ladder and that 73 yachts, respectively, 89%, with normal mainsheet routing.

Accordingly, the detachable portable bathing ladder and the 'German Mainsheet System' routing type represent an exception.

Eight yachts from three building yards, including that of the SALONA, were offered with detachable portable bathing ladders at the exhibition. In the case of the yachts of one shipyard, the bathing ladder is hooked into lugs at the stern and suspended on fixed points in a locker when in the stowed position. In the case of other builders, the bathing ladders are inserted into sockets or suspended. Only in the case of the SALONA shipyard must the bathing ladder be fastened by knurled thumb wheels.

During the investigation, extendable telescopic ladders and a 3-step 'rope ladder system' permanently integrated with the transom, both often in combination with hinged bathing platforms, were included in the assessment of the fixed bathing ladders in accordance with DIN EN ISO 15085. The functional efficiency of this 'rope ladder system', which is installed just above the water surface, should be critically reviewed. In the case of this system, it is questionable whether the ladder could be used without additional handholds on the transom and by people whose physical condition is not very good.

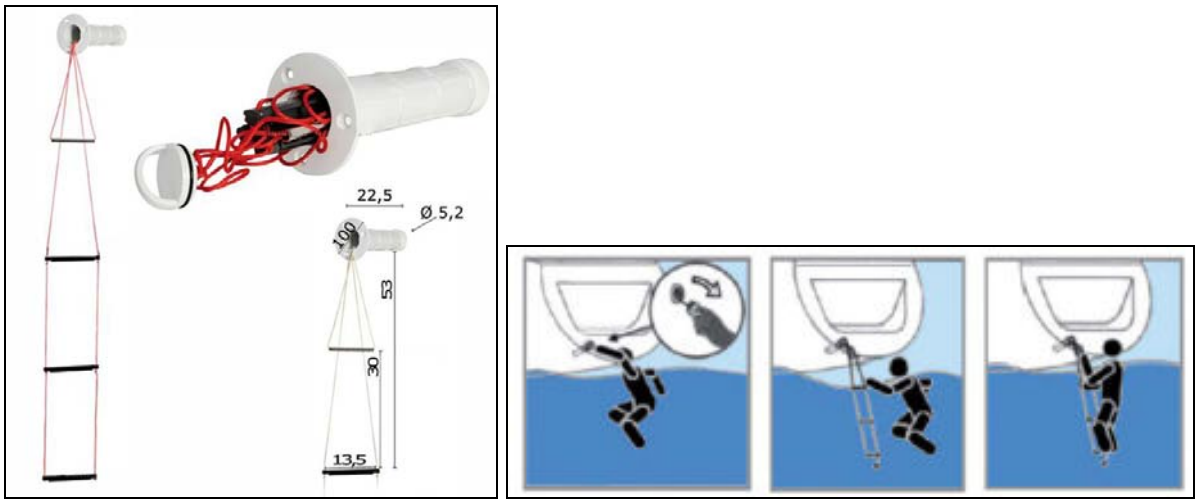


Figure 20: Type 'Rope Ladder' rescue ladder

5 Conclusions

Initially, the event that initiated the accident – the mainsheet slipping – was not necessarily a rare incident. The decision of the skipper and assistant skipper to resolve this problem immediately was an obvious option. It is difficult to understand why the two individuals did not secure themselves to the permanently installed lifelines or anything else.

The attempted rescue after the person fell overboard was not structured or coordinated. Actions evolved out of a momentum of their own and the situation on board was described as "altogether chaotic."

It is hard to understand why the distress alert was left to an unqualified person or why other distress signals, such as the continuous sounding of the tyfon, red flares, smoke signals, etc., were not emitted for other vessels.

During the investigation by the BSU, shortcomings were found in both the execution of the voyage and in the description of the technical equipment on sailing yachts.

5.1 Execution of the voyage

Had the 10 safety rules for water sport enthusiasts[7] contained in earlier publications of the BSH been complied with, then this voyage should not have ended in a fatality.

These state that anticipatory measures should be taken before the voyage, which, by way of example, should include the following:

- briefing/safety briefing for **all** sailors on board;
- clear allocation of roles and tasks;
- discuss and practise person-overboard manoeuvres.

During the voyage, it is a matter of preventing a person-overboard situation by

- operating the sails from the cockpit;
- securing oneself to lifelines or other adequate attachment points for safety lines;
- wearing and using safety lines and harnesses.

Ultimately, it is a matter of preventing drowning, where drowning in a port or a sheltered anchorage should also be prevented by

- wearing lifejackets as a matter of principle;
- practising recovering people from the water;
- summoning assistance by radio, distress signals, EPIRB or mobile phone;
- using a liferaft or the like.

[7] BSH – Safety in Maritime and Coastal Areas, Code of Good Practise for Water Sport Enthusiasts (Sicherheit im See- und Küstenbereich, Sorgfaltsregeln für Wassersportler, Point 1.4

That this fatal person-overboard accident is not an isolated case has been evident from the publications of the BSU relating to accidents involving privately used recreational craft, usually with smaller crews, since 2003. New to the most recent investigations of the BSU is that even well trained crews of racing yachts (see BSU Report No 286/09 of 15 June 2011, death of the skipper of the sailing yacht CROSS-MATCH on 20 July 2009 off Bornholm) or also crews of chartered vessels with large and supposedly experienced manning are not prepared for such accidents.

A similar accident off Mallorca involving the German flagged charter vessel sailing yacht KELBO on 29 March 2009 was investigated by the BSU and published by the coastal State Spain (Investigation Report A-08/2010 of the Spanish marine casualty investigation agency).

5.2 Technical equipment for a recovery

The BSU has already drawn attention to the problem of the complexity of carriage requirements for recreational craft in the course of other investigations. Here special mention should be made of the Foundering of SY ALLMIN (Investigation Report 203/04 of 1 October 2005) and the Capsize of the SY TAUBE (Investigation Report 15/09 of 15 February 2010). The BSU considers it relevant to safety and important for every sailor that carriage requirements and rules of conduct be defined in an intelligible form, as far as possible without cross-references, in the legislative documents. In this regard, to improve the comprehensibility of safety-related carriage requirements for recreational craft, a safety recommendation was addressed to the BMVBS advising it to work towards making the legislative documents comprehensible for everyone by using concise formulations.

The legal requirements for marine equipment appear to be inadequately described for recovery incidents. Neither DIN EN ISO 15085 – **'Reboarding Device'** nor the Recreational Craft Ordinance Sea (See-Sportbootverordnung) – **'Embarkation Ladder'** deal with the manner in which helpless people, which could also include other exhausted water sports enthusiasts floating in the water, can be rescued. The Recreational Craft Ordinance Sea (See-Sportbootverordnung) refers to the Safety Guidelines of the Cruiser Section of the German Sailing Association. In accordance with that, it prescribes that the equipment of a **'Safety Ladder'** is mandatory for chartered recreational craft. The bathing ladders currently on the market, which are evidently approved as a 'Reboarding Device', 'Embarkation Ladder' or 'Safety Ladder', definitely cannot be regarded as required 'appropriate recovery equipment for man-overboard situations' in accordance with the Safety Guidelines of the German Sailing Association. In order to recover a helpless, exhausted person, also to prevent the loss of a person by so-called recovery death[8], it is necessary to carry other appropriate means of recovery on board.

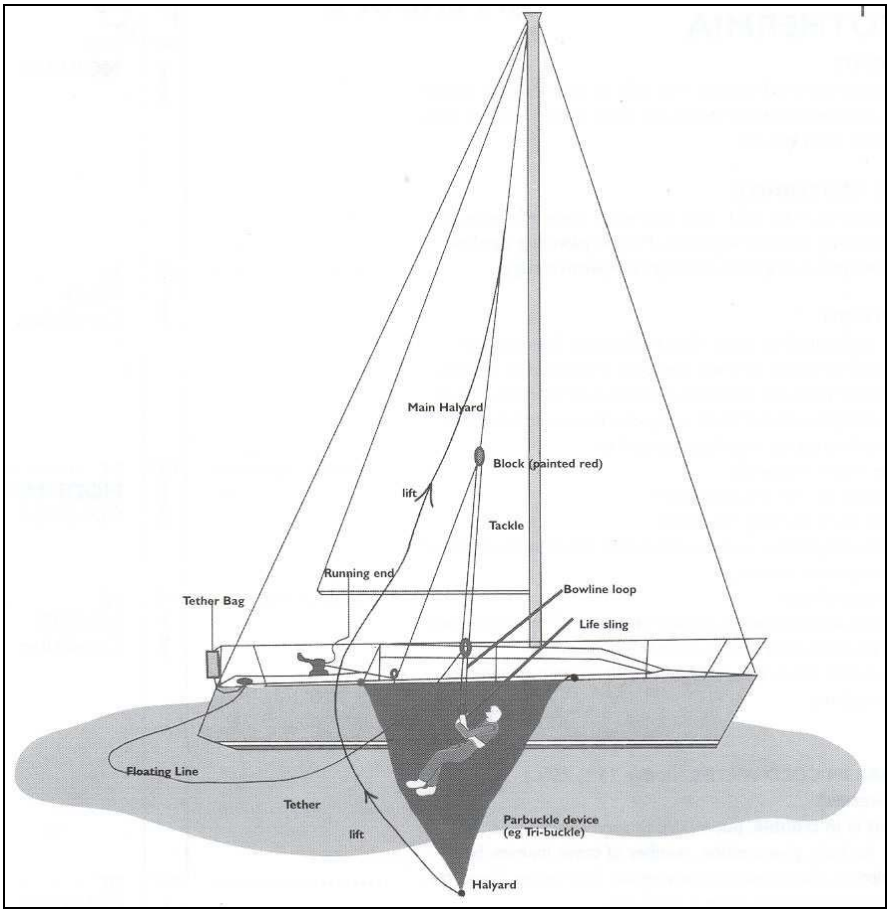
[8] A vertical recovery exposes a hypothermic person to the risk of so-called recovery death due to cardiac arrest.

A person-overboard situation gives rise to two basic questions for the crew of the vessel:

1. How can the person floating in the water be reached?
2. How can the person be brought back on board?

There are various strategies and manoeuvres for reaching a person floating in the water. These depend on the vessel, are sufficiently described in literature (Q-turn, Quick stop, Williamson turn, etc.) and also practised during training. However, it is necessary, to practise this manoeuvre more frequently, rigorously and in addition to theoretical instruction also in practical exercises, including how a person can reboard. Simply reaching the person with a well-executed manoeuvre is not sufficient – the recovery from the water is far more difficult. Therefore, to get a person back on board, technical equipment on board is necessary. Here, it is important to distinguish whether the person is still capable of actively assisting or already helpless.

Thus far, the Safety Guidelines of the German Sailing Association have not been updated to account for the latest technology. However, other requirements for appropriate recovery equipment have already been set out in the regulations of the Offshore Racing Council. The Offshore Special Regulations of the International Sailing Federation (ISAF) for 2010-2011 recommend the use of the so-called 'Parbuckle Device' (or 'Tri-buckle Device') for recovering people from the water. This recovery equipment concerns a rectangular or triangular sail, respectively, scrambling net; two corners are attached to the deck and the other corner(s) to a halyard on the mast. The casualty is manoeuvred or dragged alongside into the triangle or net and then rolled onto the deck by hoisting the halyard.



ISAF Offshore Special Regulations

Figure 21: Recovery sail/net

There are various recovery systems on the yacht equipment market, all of which are more suitable than a bathing ladder. Examples include the Markus® Lifenet, the Jason's Cradle®, the Oleu Pickup Sail and the WALDEN-WELL SAILING Berge- und Kletternetz (recovery and scramble net). The latter two are discussed in more detail below.

All these recovery systems increase the probability of the person-overboard surviving during their recovery. However, each recovery system has advantages and disadvantages, meaning there is still room for improvement in this area on the whole. The size of the yacht, the size of the crew and the other equipment on board, for example, with vacant, unused mast halyards are criteria when deciding which to purchase.

5.2.1 Oleu Pickup Sail

The Oleu Pickup Sail meets the requirements of the ISAF in accordance with Fig. 21 above and makes it possible to safely recover a person in the prone position, who is no longer able to assist actively:

Figure 22: Oleu Pickup Sail

5.2.2 WALDEN-WELL SAILING Berge- und Kletternetz (recovery and scramble net)

The WALDEN-WELL SAILING Berge- und Kletternetz (recovery and scramble net) is used as an example to illustrate the diversity of these different recovery systems. In the case of this recovery system, a red net, which is fixed to two points on the deck, is suspended overboard amidships where the yacht pitches least in swell.

If the person in the water is still able to participate in the recovery actively, then this recovery system is used as a scrambling net similar to a bathing ladder. However, the scrambling net can be used as a recovery net if the person is overweight or exhausted, for example. In this case, a halyard is attached to the lower end of the net, which forms a pocket with which the person can be rolled back on deck in a horizontal position. If recovery tackle is also attached (red tackle in Fig. 23, right), then the entire net can easily be hauled on deck without rolling by a woman with a normal physique (see Fig. 23, right). When combined with recovery tackle, this system represents a good option for recovering helpless casualties when the crew is very small.

Figure 23: Berge- und Kletternetz (recovery and scramble net)

5.3 Training and experience in person-overboard situations

Although the vessel was not perfectly equipped for recovering people from the water, she did conform to the rules (bathing ladder). In the case of this accident, a sufficient number of people on board held certificates of proficiency, meaning normally one would assume it would be possible to rescue a person-overboard with the life-saving appliances available. However, a person-overboard situation had not been planned sufficiently in advance, and the crew lacked experience in how to recover a heavy, helpless person from the water.

A sailing yacht that is perfectly equipped with technology and life-saving appliances is destined to fail in an emergency if the crew is not familiar enough with the technical equipment. Person-overboard manoeuvres and the allocation of duties in an accident should be discussed before a voyage and the manoeuvres must be practised without delay at sea.

6 Actions taken

The charter company arranged for the bathing ladder to be checked and repaired immediately. It points to the fact that all the screws are checked for functional efficiency, greased and maintained as part of the winter work schedule.

As a measure to enhance safety, the charter company recommends that customers install the bathing ladder and secure it accordingly when at sea.

During the Hanseboot 2011 exhibition, talks were held with the Vereinigung Deutscher Yacht-Charterunternehmen e.V. (association of German yacht charter companies) on the issue of safety. The talks ended with a recommendation to modify the practical part of the exam for the certificates for operating seagoing pleasure craft sea and inland (see Appendix, letter to the Federal Ministry of Transport, Building and Urban Development of 12 December 2011). All participants felt it was important that the pilots of recreational craft receive proper training in practical person-overboard manoeuvres when being trained and tested for the certificates for operating seagoing pleasure craft.

7 SAFETY RECOMMENDATIONS

The following safety recommendations do not constitute a presumption of blame or liability in respect of type, number or sequence.

7.1 Federal Ministry of Transport, Building and Urban Development

7.1.1 Regulations for the approval of chartered recreational craft

The Federal Bureau of Maritime Casualty Investigation recommends that the Federal Ministry of Transport, Building and Urban Development (BMVBS) work to ensure that the designations 'Embarkation Ladder' and 'Safety Ladder' in the Annexes Boat Certificate (Sea) and Acceptance Certificate for Recreational Craft to the Recreational Craft Ordinance Sea (See-Sportbootverordnung), which are clearly to be employed in the recovery of people, be defined in more detail. It is absolutely essential to define the safety ladder described as 'appropriate recovery equipment for man-overboard situations' in the Recreational Craft Ordinance Sea (See-Sportbootverordnung) in conjunction with the Safety Guidelines of the Cruiser Section of the German Sailing Association e.V. more precisely and in this regard address the necessity to recover a helpless or exhausted person.

7.1.2 Practical exams for the certificates for operating seagoing pleasure craft

The Federal Bureau of Maritime Casualty Investigation recommends that the Federal Ministry of Transport, Building and Urban Development (BMVBS) work to ensure that the practical training and exam for the certificates for operating seagoing pleasure craft sea and inland be modified for person-overboard manoeuvres so that the manoeuvres are sufficiently practised with lifelike dummies and that the particular situation when recovering helpless people be addressed.

7.2 German Institute for Standardisation (DIN)

7.2.1 Appropriate means of recovery for man-overboard accidents

The Federal Bureau of Maritime Casualty Investigation recommends that in its next revision of the standard DIN EN ISO 15085 'Small craft – Man-overboard prevention and recovery' the Shipbuilding and Marine Technology Standards Committee (NMST) of the German Institute for Standardisation (DIN) work to ensure that appropriate means of recovery, which must be carried on board recreational craft, are also appropriate for reboarding unassisted and for recovering helpless people in the water.

7.2.2 Portable bathing ladder

The Federal Bureau of Maritime Casualty Investigation recommends that in its next revision of the standard DIN EN ISO 15085 'Small craft – Man-overboard prevention and recovery' the Shipbuilding and Marine Technology Standards Committee (NMST) of the German Institute for Standardisation (DIN) work to ensure that portable bathing ladders, in particular, are not approved as a reboarding device on their own. If portable bathing ladders are used in spite of that, then the time to

deployment of liferafts set out in DIN EN ISO 15085 should apply analogously to the time for mounting and operational readiness. Moreover, the permanent position of the stowage location of the bathing ladder should be defined.
It is essential that the manual for the skipper be kept within reach and contains the necessary description of the reboarding device on board.

7.3 Germanischer Lloyd

The following safety recommendations are addressed to all other certification authorities and surveyors.

7.3.1 CE approval

The Federal Bureau of Maritime Casualty Investigation recommends that Germanischer Lloyd observe DIN EN ISO 15085 with regard to reboarding devices when certifying recreational craft. Although a description of the reboarding device in the manuals for the skipper is not provided by the Recreational Craft Directive and not required under the Recreational Craft Ordinance Sea (See-Sportbootverordnung), the BSU believes it should be included, nevertheless.

7.3.2 Surveyor according to the Recreational Craft Ordinance Sea (See-Sportbootverordnung)

The Federal Bureau of Maritime Casualty Investigation recommends that Germanischer Lloyd, as a surveyor of recreational craft in accordance with the Recreational Craft Ordinance Sea (See-Sportbootverordnung), inspect the embarkation ladder or safety ladder installed on board in accordance with the requirements of the Safety Guidelines of the Cruiser Section of the German Sailing Association e.V. with respect to appropriate recovery equipment for 'man-overboard' situations during the approval procedure. Furthermore, a check as to whether a manual for the skipper is on board and as to whether this contains a sufficient description of the reboarding devices[9] (see also 7.3.1) should be made.

7.4 Shipyard of the SY SPECIAL ONE

In principle, the following safety recommendation is also addressed to other yacht building yards.

[9] Within the period for consultation in accordance with art. 15 SUG in conjunction with art. 17 FIUUG, Germanischer Lloyd points to the fact that the approval procedure for charter yachts is carried out on behalf of the Waterways and Shipping Authority Lübeck by virtue of the Recreational Craft Ordinance Sea (See-Sportbootverordnung) and that the scope of examination provides for neither the inspection of a reboarding device nor a manual for the skipper. Germanischer Lloyd is of the opinion that it is not possible to implement this recommendation because the Recreational Craft Ordinance Sea (See-Sportbootverordnung) alone already contains three definitions. Desirable recommendations from the perspective of certification would be to:

- update the Safety Guidelines of the Cruiser Section of the German Sailing Association of March 2000;
- clarify the requirements for embarkation ladders, safety ladders by the legislature, respectively, amend the Recreational Craft Ordinance Sea (See-Sportbootverordnung);
- revise/supplement the harmonised EN ISO 15085 with respect to means of reboarding.

Germanischer Lloyd and all other testing and certification bodies can only check off the specifications.

The Federal Bureau of Maritime Casualty Investigation recommends that the building yard of the SY SPECIAL ONE, type Salona 45, refrain from mounting portable bathing ladders and describe the reboarding devices in the manuals for the skipper precisely.
According to DIN EN ISO 15085, reboarding devices should be functional, practicable, simple and quick to operate as well as capable of recovering helpless people.

7.5 Charter company of the SY SPECIAL ONE

In principle, the following safety recommendations are also addressed to other companies and individuals involved in letting charter vessels.

7.5.1 Means of recovering a person-overboard

The Federal Bureau of Maritime Casualty Investigation recommends that the charter company of the SPECIAL ONE ensure that particular attention is given to addressing the means of recovery and life-saving appliances on board during the handover of a vessel. This implies that the rescue system and operation of the radio are demonstrated and that the specific vessel-related manoeuvres for the recovery during a person-overboard manoeuvre are discussed.

7.5.2 The particularities of charter vessels

The Federal Bureau of Maritime Casualty Investigation recommends that the charter company of the SPECIAL ONE continue to draw attention to particularities, e.g., unusual sheet routing, which differ from normal yachts, during the handover of the vessel.

7.6 Charterer of the SY SPECIAL ONE

In principle, the following safety recommendation is also addressed to other water sport associations, sailing schools and pilots of recreational craft.

The Federal Bureau of Maritime Casualty Investigation recommends that the sailing school, which chartered the SY SPECIAL ONE, point out to its skippers that they should observe the dangers on the water even more intensively. This implies preventing oneself from falling overboard by securing with safety lines, avoiding drowning by wearing lifejackets and practising person-overboard manoeuvres, including the procedures for recovering people from the water who have fallen overboard.

8 SOURCES

- Inquiries by Waterway Police Heiligenhafen
- Written statements by the crew members
- Witness accounts
- Documents of Germanischer Lloyd
- Nautical charts, Federal Maritime and Hydrographic Agency (BSH)
- Official weather report by Germany's National Meteorological Service (DWD)
- DIN standards
- Safety Guidelines of the Cruiser Section of the German Sailing Association e.V.
- The ISAF Offshore Special Regulations for 2010 – 2011

9 APPENDICES

9.1 Letter to BMVBS of 12 December 2011

Vereinigung Deutscher Yacht-Charterunternehmen e.V.

VDC e. V., Schreinerweg 50, 22549 Hamburg

Bundesministerium für Verkehr, Bau und Stadtentwicklung
Referat WS 25
Frau Lang, Frau Schol
Robert-Schuman-Platz 1

53175 Bonn

Empfehlung zu Anpassung der praktischen Prüfungen bei den Sportbootführerscheinen Binnen und See – Mann-über-Bord-Manöver/ Notfallsituationen

Hamburg, 12. Dezember 2011

Sehr geehrte Frau Lang, sehr geehrte Frau Schol,

bei dem von der VDC am 2. November 2011 veranstalteten 2. Runden Tisch zum Austausch nach der Wassersportsaison und Thema Sicherheit, waren im Rahmen der hanseboot 2011 folgende Teilnehmer anwesend:

Jürgen Albers – BSU – stellv. Leiter
Christian Bubenzer – BG Verkehr – Referat Schiffbau, Dienststelle Schiffssicherheit
Bernhard Gierds – KYCD – Vorsitzender
Dr. Steffen Häbich – ADAC – Leiter Grenzverkehr & Sportschifffahrt
Jan Hegerfeld – VDC – Vorstand und Inhaber des Charterunternehmens RealSailing/ Fehmarn
Günter Herrmann – Wasserschutzpolizei Schleswig-Holstein – WSP Revier Flensburg
Dr. Joachim Heße – KYCD – stellv. Vorsitzender
Hartmut Hilmer – Wasser- und Schifffahrtsdirektion Nord
Marion Köhnemann – VDC – Geschäftsstelle
Stefen Staudenmeyer – Charterzentrum Kappeln
Claus-Peter Pfeiffer – Germanischer Lloyd
Doreen Thoma – BSH

Zum Punkt Sicherheit berichtete Herr Albers, BSU, dass die Wassersportsaison 2011 im Vergleich zu anderen Jahren gut verlaufen ist.
Herr Albers erörterte, dass die englischen Sicherheitsrichtlinien (Offshore Special Regulation/ ISAF), an die die Sicherheitsrichtlinien des DSV angelehnt sind, mittlerweile weiterentwickelt wurden. Es wurde ergänzt, dass Bergesysteme, für das Bergen von über Bord gegangenen Personen an Deck empfohlen werden.

Die Teilnehmer des Gesprächs waren sich einig, dass etwaige Vorschriften (Tragepflicht von Rettungswesten oder Ausrüstungspflicht mit Rettungs- und Bergegerät) die objektive Sicherheit auf dem Wasser nicht verbessert.

Postanschrift/ Hausadresse
Schreinerweg 50

Telefon: 0049 40/37 42 13 32
Fax: 0049 40/25 48 23 57

Email: info@vdc.de
Internet: www.vdc.de

Es muss ein Umdenken in den Köpfen der Wassersportler passieren. Man muss ihnen übermitteln, dass vor dem Einsatz eines Bergemittels drei Hürden genommen werden müssen:

1. Sichten und wiederfinden einer Person
2. Die Person muss über Wasser bleiben
3. Annähern an die Person und Manövrieren in eine Bergeposition

Besonders dem nicht so routinierten Charterskipper muss klar gemacht werden, dass diese Situationen auf ihn zukommen können.
Gute Seemannschaft bedeutet, für mich, für die Crew, mein Boot und mein Seegebiet Handlungsmuster parat zu haben, um Notsituationen meistern zu können.
Das so etwas nicht im Rahmen der normalen Einweisung der Chartercrew übermittelt werden kann, ist den Teilnehmern klar. Die Charter-Sicherheitskarte der VDC ist ein Schritt in die richtige Richtung.
Neben der Information und Aufklärung der Crew über mögliche Risiken auf dem Wasser muss dem Wassersportler schon bei seiner Ausbildung die Grenzen des Machbaren aufgezeigt werden.
Nur beim Durchfahren realer Lagen wird dem Wassersportler klargemacht, dass man einen Körper von 80 kg nicht allein aus dem Wasser ziehen kann und dass man von Bord eines normalen Sportbootes nicht an die Heißöse der ausgelösten Rettungsweste einer im Wasser treibenden Person gelangen kann. Es müssen andere Lösungswege gefunden werden, auf die der angehende Skipper im praktischen Teil der Ausbildung real vorbereitet werden kann.

Die derzeitige praktische Ausbildung bei den Sportbootführerscheinen und das dort geprüfte Mann-über-Bord-Manöver mit einem Fender oder einem Gegenstand, ist nicht ausreichend. Das Bergen eines Fenders spiegelt in keiner Weise das Gewicht und die mögliche fehlende aktive Mitarbeit einer zu rettenden Person wider. Es kann also kein Bewusstsein für die Gefahrensituation entwickelt werden.

Alle Teilnehmer empfehlen daher, die praktische Ausbildung und die praktische Prüfung hierhingehend anzupassen (beispielsweise mit dem verpflichtenden Einsatz von Puppen oder schwereren Gegenständen). Die notwendige Zeit für das erlernen das Manövers sollte ausreichend bemessen sein.

Für Fragen und weitere Gespräche diesbezüglich stehen die aufgeführten Beteiligten gerne zur Verfügung.

Mit freundlichen Grüßen

gez. die Teilnehmer

Postanschrift/ Hausadresse
Schreinerweg 50
22549 Hamburg, Germany

Telefon: 0049 40/37 42 13 32
Fax: 0049 40/25 48 23 57

Email: info@vdc.de
Internet: www.vdc.de