



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

Investigation Report No. 347/05

Serious Marine Casualty

**Collision of
SY ALIADO and SY KATTEGAT
in the Fairway of Rudkøbing Løb/DK
on 25 July 2005**

1 August 2006

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

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

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

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1 Summary of the Marine Casualty

On 25 July 2005 two German sailing yachts collided in the fairway of Rudkøbing Løb in Denmark on position 54°58,0'N and 010°42,5'E. The southbound sailing yacht ALIADO crashed into the starboard side in the cockpit area of SY KATTEGAT, which was sailing under motor, at an almost right angle. Thereby the jib-boom of SY ALIADO got stuck on the aft radar unit support and on the steering wheel of SY KATTEGAT, and it took great effort to separate both the vessel. The jib-boom and the jib stay of SY ALIADO as well as the starboard railing, the bulwark and the helm of SY KATTEGAT sustained substantial damage.

The skipper of SY KATTEGAT, who had been standing at the helm, sustained several injuries and was off work from 25 July until 12 August 2005.

2 Scene of the Accident

Nature of the incident: Serious marine casualty, collision with injured person
 Date/Time: 25 July 2005, about 12:55 p.m. CEST¹
 Location: Rudkøbing Løb in Denmark
 Latitude/Longitude: φ 54°58,0'N λ 010°42,5'E

Section from Chart 3003, Sheet 9 Federal Maritime and Hydrographic Agency (BSH)

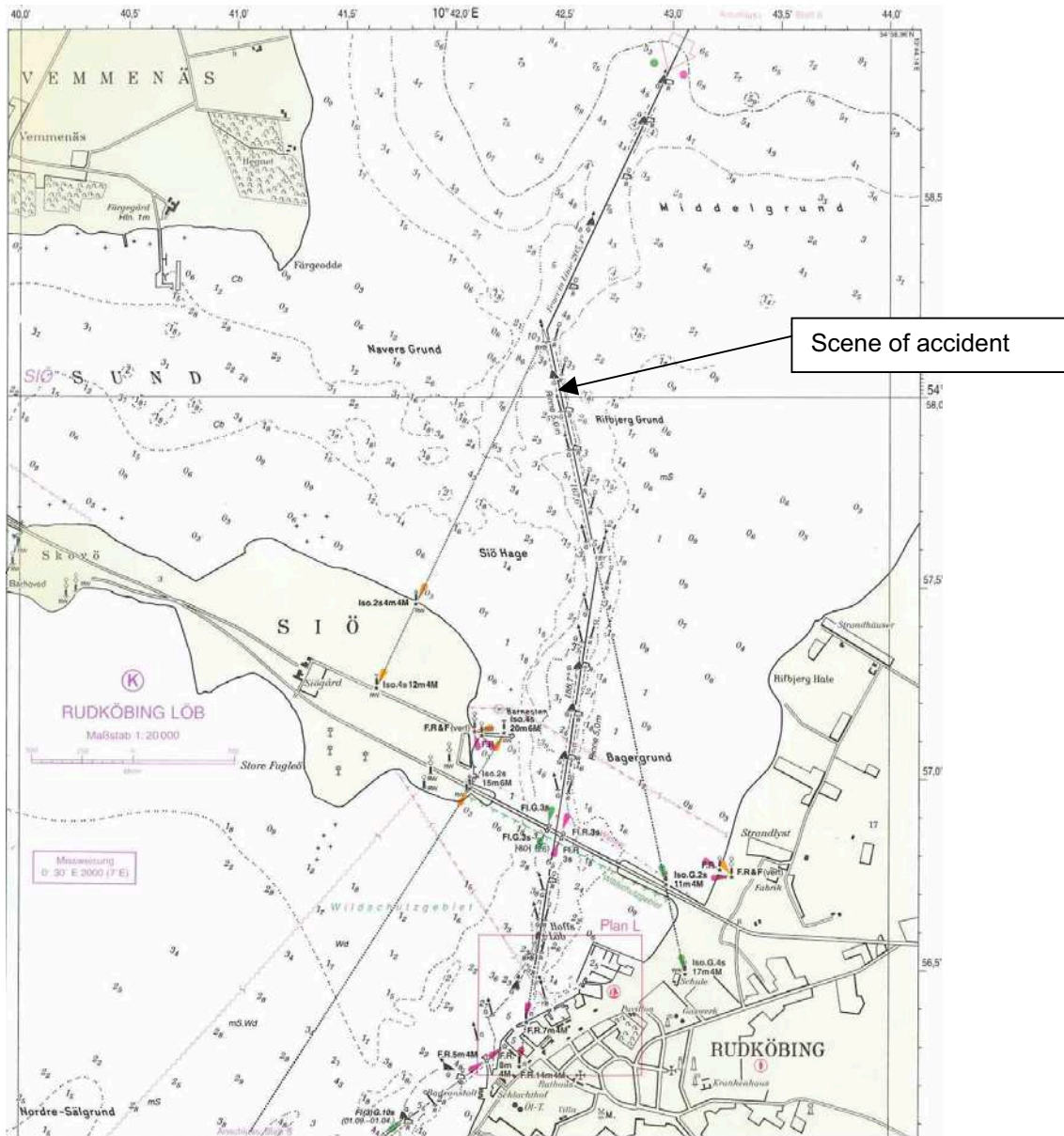


Fig.1: Chart

¹ all times in CEST – Central European Summer Time

3 Vessel particulars

3.1 Photo of SY ALIADO



Fig. 2: Photo of the vessel ALIADO

3.2 Vessel particulars

Name of vessel:	ALIADO
Type of vessel:	Sailing yacht/Gaff sail cutter
Nationality/Flag:	German
Port of registry:	Kiel
Year built:	about 1900
Building yard/location:	Denmark
Length overall:	9.50 m
Width overall:	3.80 m
Draft at the time of the accident:	1.55 m
Water displacement:	10.0 t
Engine rating:	55 PS
Main engine:	Volvo Diesel
Hull material:	wood
Number of crew:	2 adults and 1 child

3.3 Photo of SY KATTEGAT



Fig. 3: Photo of the vessel KATTEGAT

3.4 Vessel particulars

Name of vessel:	KATTEGAT
Type of vessel:	Sailing yacht X-382
Nationality/Flag:	German
Port of registry:	Glücksburg
Year built:	2000
Building yard, location:	Haderslev, Denmark
Length overall:	11,50 m
Width overall:	3.70 m
Draft at the time of the accident:	2.00 m
Water displacement:	about . 6.5 t
Engine rating:	28 PS
Main engine:	Yanmar Diesel
Propeller:	Saildrive
Hull material:	glass fibre reinforced plastic
Number of crew:	4 persons

4 Course of the Accident

4.1 Account from the View of SY ALIADO

The sailing yacht ALIADO was steered by the 42 year old skipper, who holds a German yacht certificate (Sea) for leisure crafts since 1989. At the time of the accident the 49 year old co-sailor, who also holds a yacht certificate since 1989 was at the helm. Her 9 year old daughter accompanied her. The skipper has owned the yacht since 1992 and had been learning sailing on jolly boats up to 18 m long cutters since he was a little boy. Together with the helmswomen he has already undertaken several trips with this vessel. Both of them were in their third holiday week on their way to Strynø Island within the scope of an old-timer squadron tour.

At 11.00 a.m. on July 25th, 2005 they started at Thurö Bund and reached the Rudkøbing Løb fairway at 12:00 p.m.. On their way to the shoal buoy of Naversgrund Ost, they sailed partly in the fairway, partly outside the fairway. Shortly before altering the course at this buoy, two meeting sailers were observed at a distance of about 0.5 nm running side by side under motor in the fairway. While SY ALIADO passed the shoal buoy of Naversgrund Ost, it became obvious that these yachts had already terminated the overtaking and sailed one after the other. The front yacht came to meet SY ALIADO, which was sailing far on the starboard side, in the centre of the fairway with altering courses. Diagonally behind SY ALIADO on her starboard side, a faster, overtaking sailing yacht was sailing slightly outside the fairway. At the buoy of Naversgrund Ost, the crew made a jibe and secured the gaff mainsail with the topsail set on the starboard side by means of a simple rope used as guy. The jib was swung out on port by means of the boat-hook, and the jib fluttered without much pressure on the sails in the cover of the other sails. The skipper had the impression that SY KATTEGAT wanted to pass between them and the overtaking sailing vessel. Therefore, the skipper of SY ALIADO went to the forecabin with his foghorn, in order to signal, if necessary, or to loosen the lazy guy for a manoeuvre. However, he failed to signal, as he did not want to make the crew of the meeting vessel feel insecure and besides they had eye contact to each other. With a distance of about 30 to 40 m, SY KATTEGAT was clearly sailing on her side of the fairway again, and it looked as if the yachts would pass each other port by port. It was not before she was directly within call that SY KATTEGAT again altered her course to port, and then ALIADO altered her course clearly to starboard. When SY KATTEGAT put the helm even more to port, the skipper of SY ALIADO tried by shouts to induce SY KATTEGAT to steer another course, because otherwise they would not be able to manoeuvre due to the slow speed of about 3 to 3.5 knots. When SY KATTEGAT was directly in front of the stern of SY ALIADO, they even tried to get behind the stern of SY KATTEGAT with the rudder on port, but the jib-boom got stuck behind the mounting of the support of the radar unit and the steering stand on the stern of SY KATTEGAT. SY ALIADO hit the starboard side of SY KATTEGAT in the aft cockpit area with a collision angle of about 45°. The scene of the collision was entered into the chart No. 15 of the Federal Maritime and Hydrographic Agency (BSH) as ϕ 54°58,07'N and λ 010°42,46'E. Shortly before the crash, the skipper of SY ALIADO had seen two women behind the steering wheel of SY KATTEGAT, who were very busy putting the helm. Immediately after the collision, all sails were taken in, and the motor was started. The meeting sailer passed the pack of boats stuck into each other on port, only the yacht overtak-

ing under sail passed SY ALIADO on her starboard side. After several attempts the vessels got clear of each other, and SY ALIADO towed SY KATTEGAT, the rudder of which was broken, to the entry of the port of Rudkøbing.

SY ALIADO is steered by means of a tiller. The vessel is a course-keeping long-keel vessel with a turning circle of about 2 ship's lengths. At the time of the accident the vessel was slightly weatherly to port due to the trim of the mainsail on starboard. All members of the crew of SY ALIADO were wearing lifejackets.

4.2 Account from the View of SY KATTEGAT

The owner of the sailing yacht KATTEGAT is the German Yacht Association, (Deutscher Hochseesportverband "Hansa" e.V. (DHH)/Hanseatic Yacht School, Glücksburg (Hanseatische Yachtschule Glücksburg). SY KATTEGAT was on a two weeks' training voyage, the end of which was the applicatory examination for a German yacht certificate for coastal traffic (SKS). For honorary sailing teacher and skipper, a 40 year old woman was assigned. The skipper has gained her sailing experience on the Alster, on her parents' boat and on various yachts of the DHH and holds a German yacht certificate (high sea) for leisure crafts since April 2001. Having previously acted for the DHH as skipper's assistant on larger yachts, the DHH appoints her since then as skipper. 3 sailing trainees took part in this training voyage. This crew consisted of 51 year old Mrs. A, holder of a German yacht certificate for leisure crafts since 1982 having 25 years of sailing experience as a sailing trainee, mainly on vessels with keels, like Folke-boat or Laurin Coaster, respectively. The second sailing trainee was Mr. B, 53 year old, who has been sailing mainly on jolly boats in inland shipping since September 2004 and holds a German yacht certificate (Inland) for leisure crafts (SBF-Binnen) since Sept. 2004, as well as a German yacht certificate (Sea) for leisure crafts since April 2005 and passed the examination for SKS on board at the end of the voyage, on 4 August 2005. The third sailing trainee, Mr. C, holds a German yacht certificate (Inland) for leisure crafts since 1985, a German yacht certificate (Sea) for leisure crafts since 1990 and before the voyage had booked a 14 days' course in Folke-boat sailing as well as passed his basic certificate in the sailing boats with keels with the DHH.

According to the submitted excerpts from the log-book, the voyage began at Glücksburg at 09.00 a.m. on 24 July 2005, giving a safety instruction on board. No substitute for the skipper of the vessel was determined. At 11:45 a.m. the vessel weighed anchor, in front of the harbour all participants performed a "Person overboard" manoeuvre and subsequently started their voyage. The next destination, the port of Marstal, was reached, under changing sail command, after a voyage of less than 10 hours at 09:25 p.m.. The next day, the vessel weighed anchor at 10:10 a.m. and sailed under motor with winds from northeast of 2 Bft. At about 12:30 p.m., after passing the Langelandsbroen (bridge) of Rudkøbing, Mr. B passed the rudder onto Mrs. A and went below deck in order to use the board toilet. Mrs. A was sailing northbound along the red buoys on starboard side. After a short voyage of about 7 to 8 cable's lengths Mrs. A passed the rudder to the skipper at about ϕ 54°57,7'N and λ 010°42,6'E, because she saw two sailing boats which occupied the complete width of the fairway running under sail on a downwind course at distance of about 0,5 nm

near the shoal buoy of Naversgrund O. One of the sailing yachts remained on port ahead at the limit of the fairway after having passed the shoal buoy. The other sailing yacht approached the SY KATTEGAT on her side of the fairway on starboard and thus running on a collision course. At first the skipper made way to starboard in the direction of the line of the buoys, but the collision course of the sailing yachts remained unchanged. In the skipper's opinion, a further evading movement to starboard was not possible, as SY KATTEGAT already sailed on the line of the buoys. At a distance of less than half a cable's length the skipper had the impression that the meeting vessel now altered her course even further to port in her direction. Since she assumed that she could not leave the fairway to the starboard side because of the shallow water of Rifbjerg Grund. She altered the course clearly to port towards the centre of the fairway in order to avoid a collision. There was no more time left for a sound signal, and immediately after the alteration of the course the meeting-sailing yacht also altered her course towards the centre of the fairway. The collision occurred at 12:55 p.m. approximately on position ϕ 54°58,0'N and λ 010°42,5'E. The skipper sustained serious injuries, he had to be under medical treatment at the hospital in Svendborg and was off work for three weeks.

The speed of SY KATTEGAT through the water shortly before the collision was about 4 kn. The X-yacht 382 reacts immediately to the rudder. The turning circle is less than one ship's length. The full rudder position from amidships to port or starboard, respectively, can be achieved by a full revolution of the steering wheel.

No lifejackets were worn at the time of the accident.

4.3 Wind and Seaway

According to the official expert opinion of Germany's National Meteorological Service, Department Marine Meteorological Services, in the early morning hours of 25 July 2005, an Atlantic low pressure area was lying with its core over Southern England. The appertaining front system extended in a curve over the southern North Sea and Germany to France. In the course of the day, the front system moved eastward crossing the western Baltic Sea. The low pressure area also moved eastward becoming weaker and in the following night was lying over Southern Sweden.

In the sea waters west of Langeland it was mostly heavily overcast, and showers occurred again and again, thunderstorms were not reported, but cannot be ruled out. The horizontal visibility was mostly clearly above 10 km, only occasionally it was less. In the sea waters concerned, a weak northerly wind blowing, which reached an average force of 2 to 3 Bft.

The depth of the water between Fünen and Langeland is between 0.6 and 2.5 m. There the prevailing weak northerly wind could only cause a seaway that should have been clearly below 0.5 m. Even in the free southern Baltic Sea, no seaway above 0.5 m was observed.

5 Investigation

In August 2005, the Federal Bureau of Maritime Casualty Investigation was informed about this accident by the Marine Insurance and Safety Association (See-BG) due to the accident report by the DHH.

5.1 Scene of the Accident

The Rudkøbing Løb fairway, north of Rudkøbing, is marked as a 5 m deep fairway with lateral buoys according to the maritime buoy system of IALA, Region "A" as well as with three lines of leading lights. The direction in which the buoys are positioned is from north to south (coming from north, red buoys on port). The sailing directions for the Baltic Sea of the German Yachting Association includes the following sailing instructions for the fairway north of Rudkøbing:

"At the northern end of the fairway, a red and white landfall buoy is positioned with a ball as top sign. Vessels coming from the north can take the 205,4°-Siø-N leading light Iso.2s (U-F)/ Iso.4s (O-F); it leads over water with a depth of 3 to 4 m. At the intersection of this line of leading lights and the next following to 167,6° NO leading Iso.G.2s (U-F)/Iso.G.4s (O-F) at the latest, leisure crafts as well should use the fairway marked with buoys, as from here on grounds with less than 1 m water are reaching closely to the fairway..."

For the scene of accident there are no special Danish rules. Nor is the Rudkøbing Løb fairway mentioned in the Danish "Bekendtgørelse om regler for sejlads m.m. i visse danske farvande"². Thus, at the scene of the collision the International Regulations for Preventing Collisions at Sea (COLREG) apply.

Knowing the above sailing instruction, Rule 9 COLREG – Narrow Channels – is applied as relevant rule.

5.2 Damages

The damages on board the SY ALIADO amounted to 3000.-- €. The jib-boom, the water stay and the jib stays had to be replaced.

The damages on board the SY KATTEGAT amounted to about 10.000.-- € . The steering wheel was completely destroyed. The stern pulpit, some railing stanchions and the railing roped as well as zones of glass fibre reinforced plastic on the hull were damaged.

The costs of the treatment of the injured skipper have not been assessed.

² Notification of the Shipping Rules etc. in Certain Danish Waters

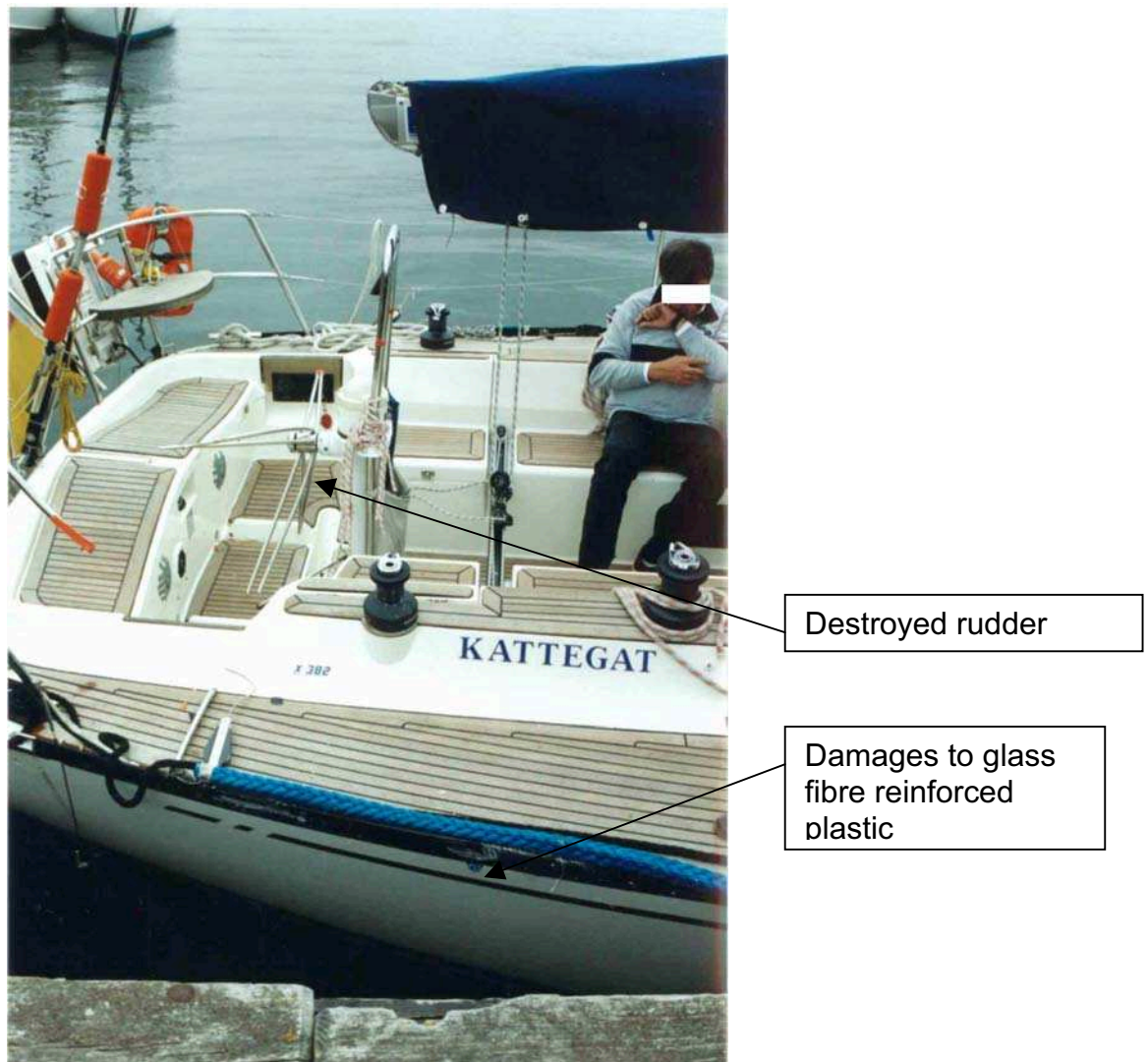


Fig. 4: Damages on board the SY KATTEGAT

5.3 Charts used on Board

On board the SY ALIADO the chart of the BSH, No. 15, Edition of 2005, was used. The BSH detail chart has a scale of 1:20.000.

On board the SY KATTEGAT, they had the edition of 2005 of the leisure charts of the publishing company Nautische Veröffentlichung Verlagsgesellschaft mbH, Arnis. The detail chart No. S5A with a scale of 1:30.000 (1:32.490) shows certain differences, especially in the sea-bed contours stated, as compared to the charts by other editors available on the market.

According to the chart of the BSH No. 15 the buoys positioned on the port fairway side beginning with the buoy of Naversgrund Ost is as follows:

2 red spar buoys with top signs, 2 red cylindrical buoys, 2 red spar buoys with top signs, yellow-black-yellow west cardinal buoy with top signs.

According to the chart S5A of the publishing company NV-Verlag, the buoys are:

1 red spar buoy with top signs, 1 red cylindrical buoy, 1 red spar buoy with top signs, 1 red cylindrical buoy, 2 red spar buoys with top signs, west cardinal buoy with top signs.

Az.: 347/05

The skipper of SY ALIADO had entered the scene of the collision with the position ϕ $54^{\circ}58,07'N$ and λ $010^{\circ}42,46'E$ near the first green stub buoy behind the shoal buoy of Naversgrund Ost into his charts by the BSH used on board.

The skipper of SY KATTEGAT states the position ϕ $54^{\circ}58,0'N$ and λ $010^{\circ}42,5'E$ as place of the collision. This place is noted in the log-book and has been entered into a copy of the chart S5A by NV-Verlag on board at that time.

Both places stated have been entered into the according to magnified details of the charts:

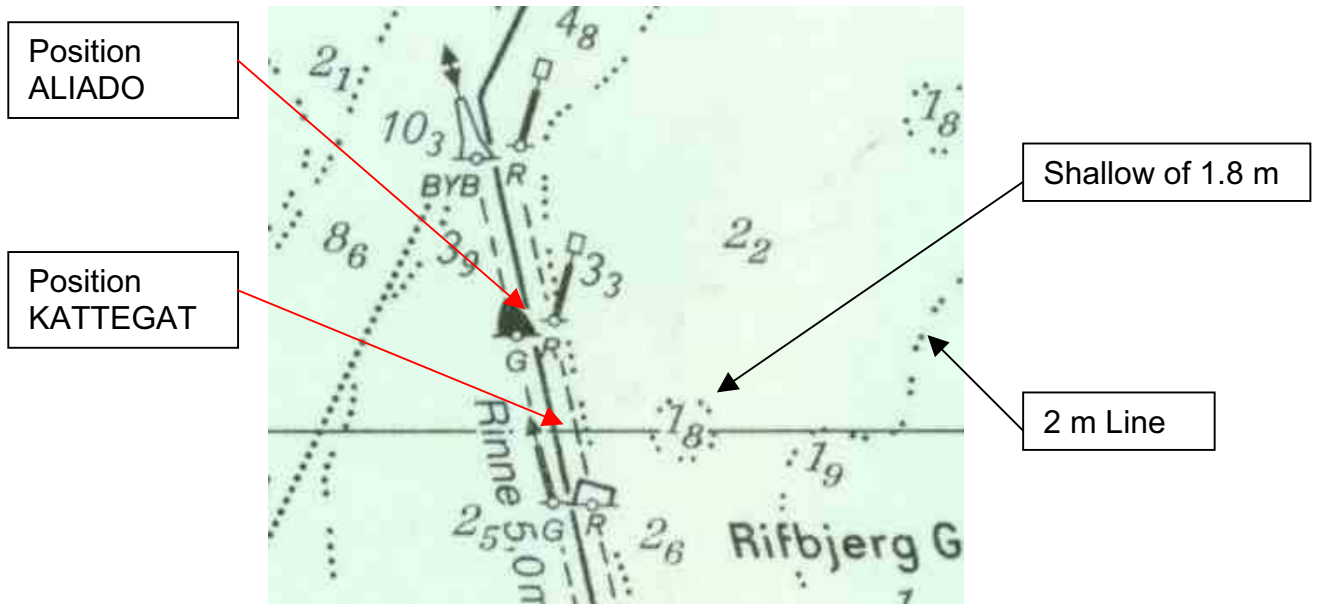


Fig. 6: BSH, Chart D15

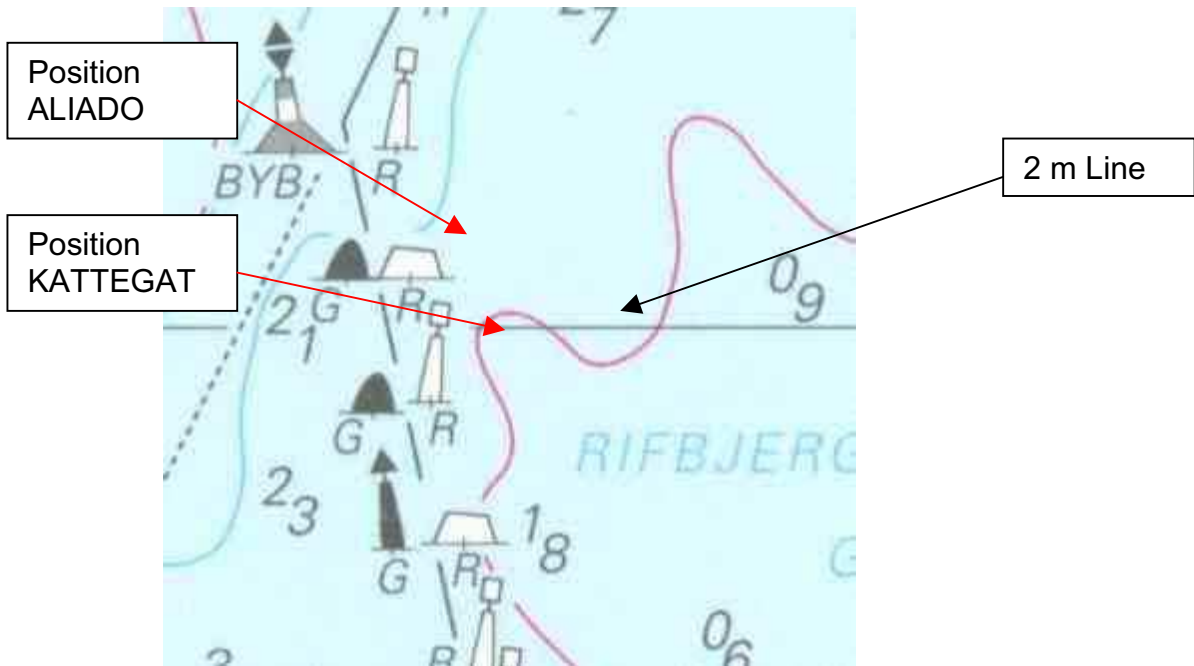


Fig. 7: NV Publishing Company Chart S5A

5.5 Danish Sounding Data and Positions of the Buoys

On request of the BSU, the Royal Danish Administration of Navigation and Hydrography transmitted the sea-buoys laid out in 2005 and the positions of the fairway of Rudkøbing Løb as well as the recent sounding data of the depths of the water:

Blåbog

(Blue book)

Farvandsvæsenet
(Administration of Fairways)

Afm-navn	Nord (North)	Øst (East)	Funk	Farve (Colour)	Top	Vagerform
Rudkøbing NE Fyrlinie stb. 1	54°58,147	10°42,414	E-CAR m/top	BYB	Øst kardinal, E-CAR	SPAR
Rudkøbing NE Fyrlinie bb. 1 (lystøde i peri- oden 1/9-1/4 Fl(3) R 10s.)	54°58,147	10°42,450	PORT m/top	R	Rød stump, CAN	SPAR
Rudkøbing NE Fyrlinie stb. 2	54°58,054	10°42,452	STAR m/top	G	Grøn konisk, CONE	SPAR
Rudkøbing NE Fyrlinie bb. 2	54°58,057	10°42,484	PORT m/top	R	Rød stump, CAN	SPAR
Rudkøbing NE Fyrlinie stb. 3	54°57,962	10°42,487	STAR m/top	G	Grøn, konisk, CONE	SPAR
Rudkøbing NE Fyrlinie bb. 3	54°57,965	10°42,519	PORT m/top	R	Rød stump, CAN	SPAR
Rudkøbing NE Fyrlinie stb. 4	54°57,860	10°42,524	STAR m/top	G	Grøn konisk, CONE	SPAR
Rudkøbing NE Fyrlinie bb. 4	54°57,864	10°42,554	PORT m/top	R	Rød stump, CAN	SPAR
Rudkøbing NE Fyrlinie bb. 5	54°57,770	10°42,590	PORT m/top	R	Rød stump, CAN	SPAR
Rudkøbing NE 1Fyrlinie bb. 6	54°57,710	10°42,619	PORT m/top	R	Rød stump, CAN	SPAR
Rudkøbing NE Fyrlinie stb. 5	54°57,622	10°42,597	STAR m/top	G	Grøn, konisk, CONE	SPAR
Rudkøbing NE Fyrlinie bb. 7	54°57,594	10°42,667	W-CAR m/top	YBY	Vest, kardinal, W-CAR	SPAR

In Denmark, the type of buoys that was laid out is called Blåbog SPAR BUOY. The buoys on the port of the fairway beginning with the Ost Naversgrund buoy (Rudkøbing NE/Fyrlinie stb. 1) are all of the same type, spar buoys with stub top signs, (Rød stump, CAN). On the starboard side as well only spar buoys had been laid out, all of which were provided with pointed top signs (Grøn konisk, CONE).

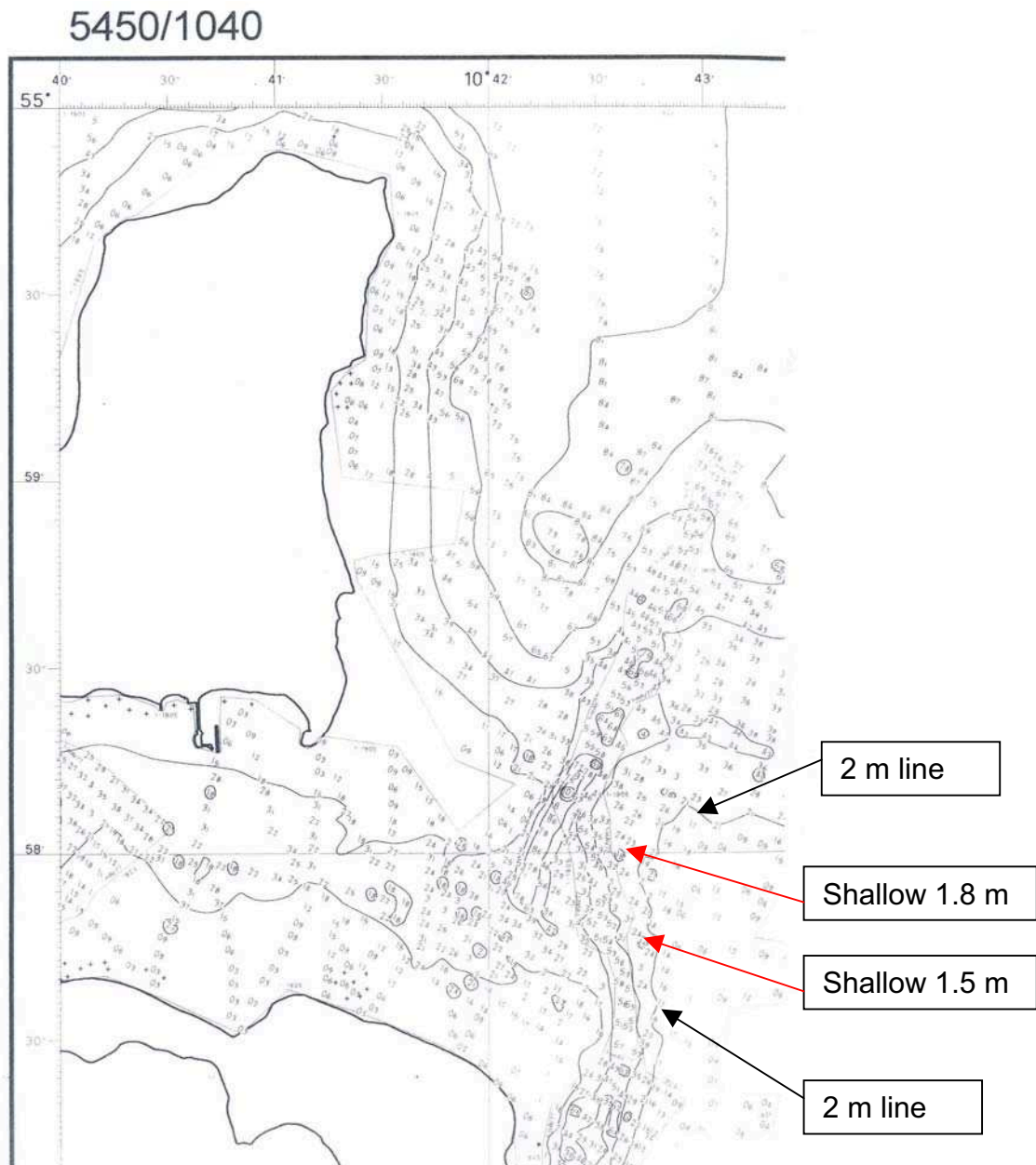


Fig. 8: Sounding Data

The sounding data of the depth of the water transmitted from Denmark are identical to the data in the BSH chart No. 15. In particular the course of the 2 m line and the position of the two shallow water areas of 1.8 m and 1.5 m on the port of the fairway coincide with the data in the chart by the BSH.

Thus, the course of the 2 m line in the chart by the NV Verlag is not in keeping with the data of the Royal Danish Administration of Navigation and Hydrography. In the chart of the NV Verlag, the 2 m line is drawn directly at the 5 m fairway, and in this respect, it is not stated correctly. In both charts the types of buoys and top signs are not identical to the Danish statements.

Each of the chart partly shows CAN buoys with top signs and partly cylindrical buoys without top signs.

Besides the official leisure charts of the BSH and the leisure charts of the publishing company NV Verlagsgesellschaft mbh, Arnis, the Delius Klasing leisure charts are available on the German market. The following section from the detail chart KRT. 318 (amended in 04/2005), scale 1:15.000, is taken from set 1 - Kieler Bucht and Rund Fünen. In this chart, the course of the fairway and the data of the buoys of Rudkøbing Løb fully coincide with the Danish sounding and buoy data.

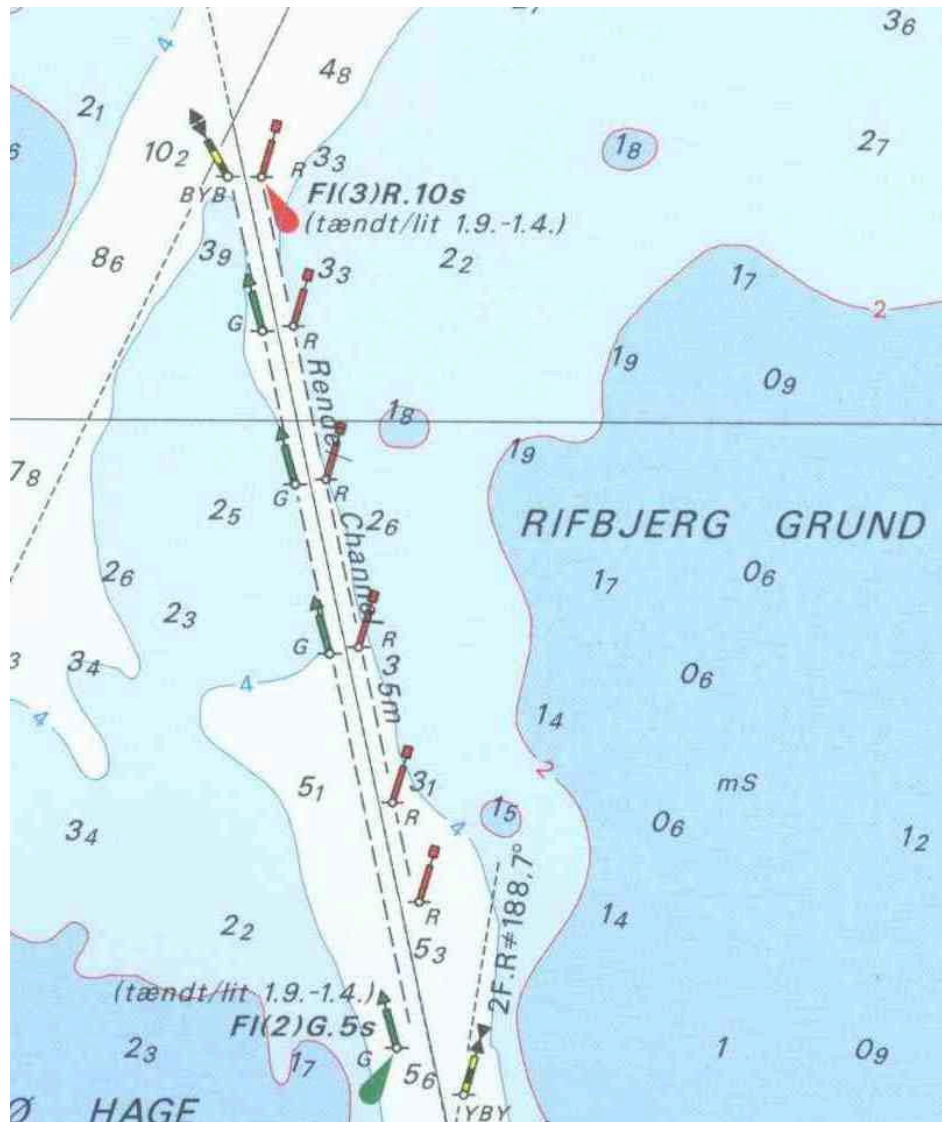


Fig. 9: Chart 318 - Delius Klasing

5.6 Type of business of SY KATTEGAT

The Deutsche Hochseeverband "Hansa" e.V. (DHH) with more than 16.000 members, a registered association with non-profit making character runs a total of three yachting schools. They are the Yachtschool Chiemsee (SYC) in inland shipping, the Hanseatic Yachtschool Glücksburg (HYS) in the Baltic Sea and North Sea and the Yachtschool Elba (YSE) in the Mediterranean Sea. According to the brochures of the DHH almost 6,000 persons take part in sailing courses and voyages a year, of these, about 2,500 yachswomen and yachtsmen book courses with HYS. For the training 200 vessels owned by the association are available. The yachts owned by HYS are exclusively available to the members for their practical training on sea. The training is performed by full-time teachers of sailing schools and members of the association working as honorary teachers. The honorary skipper was given an employment contract for a short-term employment and was insured against accidents with the See-BG for the period of the training voyage.

The vessels were not issued with a Training Vessel Licence by the See-BG under the terms of the Regulation on Safety Provisions for Leisure Crafts Used as Professional Training Vessels according to § 52a SchSV (Regulation for Training Vessels).

The normal booking price for the two weeks' practical training for the German yacht certificate for leisure coastal traffic (SKS) was 1,380.-- €, and it was recommended to take out a policy of an insurance against a cancellation of the voyage with the respective travel agencies. A membership in the association is a precondition in order to take part in the events, the membership being free from contributions for the first year.

6 Analysis

6.1 Marine Casualty

According to the investigations by BSU, both the sailing yachts did not navigate according to the appropriate basic rules for a behaviour in traffic. In particular the Rules 7, 8, 9, 14 and 34 of the International Regulations for Preventing Collisions at Sea (COLREG) were not observed.

6.2 Rules for Evasive Manoeuvres according to COLREG

6.2.1 Rule 7 COLREG

Rule 7 of COLREG contains the following provision on the possibility of a risk of collision:

- (a) Every vessel shall use all available means appropriate to the prevailing circumstances and conditions to determine if risk of collision exists. If there is any doubt such risk shall be deemed to exist.*

6.2.2 Rule 8 COLREG

Rule 8 of COLREG states on the manoeuvre for the avoidance of collisions:

- (a) Any action taken to avoid collision shall, if the circumstances of the case admit, be positive, made in ample time and with due regard to the observance of good seamanship.*

.....

- (e) If necessary to avoid collision or allow more time to assess the situation, a vessel shall slacken her speed or take all way off by stopping or reversing her means of propulsion.*

6.2.3 Rule 9 COLREG

There is no internationally uniform definition for narrow fairways. The Danish government agency, the Danish Maritime Authority (DMA), when asked on this by the BSU, stated that one would have to navigate according to the provision of Rule 9 COLREG (COLREG).

Based upon the sentences practised by the Bundesoberseeamt, e.g. W 9/90 dated 12.12.1990, one also may assume a narrow channel:

"The narrowness of a fairway has to be seen in the fact that due to the limited manoeuvring space, a vessel is deprived of the possibility to make a manoeuvre to starboard or port without any problems.

With this background and the indication in the sailing directions of the Baltic Sea the fairway Rudkøbing Løb is a narrow channel within the meaning of Rule 9 COLREG.

Rule 9 – Narrow Channels

(a) A vessel proceeding along the course of a narrow channel or fairway shall keep as near to the outer limit of the channel or fairway which lies on her starboard side as is safe and practicable

On this, the commentary by Hilgert/Schilling on Rule 9 (a) reads as follows:

...

Thus, one may deviate from the provision laid down in rule 9 (a) in case of occurrence of special conditions. For these exceptions, the following cases come into question:

1.
2.
3. If one cannot keep to the right side of the fairway because a danger of grounding exists. However, if the vessel is forced to evade a meeting vessel, it is always better to get pushed on the ground at on one's starboard side than to steer to the left side of the fairway. If a collision at the border of the fairway occurs, it is always the vessel that left her side of the fairway that is considered incriminated and in any case has to prove that she could not act otherwise. An old rule reads as follows:

"It is better to ground the vessel on the right side of the fairway than to collide in the centre or on the wrong side of the fairway."

Another commentary by Capt. Pierre Deseck on Rule 9 COLREG reads as follows:

Rule 9 applies to all vessels, power-driven as well as sailing vessels.

If without good reason a meeting vessel does not keep to the starboard side of the channel or fairway, or if she navigates on the wrong side and does not alter her course to starboard in time, this will create uncertainty on board the other vessels. In that case it is advisable to take the following steps:

1. give a warning signal (see Rule 34 (d));
2. keep as far to starboard as is safe and practicable (give the appropriate signal as required by Rule 34 (a));
3. reduce speed or eventually take all way off.

Leaving the starboard side and altering course to port is generally considered a wrong manoeuvre and an impediment to the safety of navigation.

6.2.4 Rule 34 COLREG

The manoeuvres to be applied and warning signals according to Rule 34 COLREG were not given by any of the vessels. In particular one would have had to observe Rule 34 (d) according to COLREG:

(d) When vessels in sight of one another are approaching each other and from any cause either vessels fails to understand the intentions or actions of the other, or is in doubt whether sufficient action is being taken by the other to avoid collision, the vessel in doubt shall immediately indicate such doubt by giving at least five short and rapid blasts on the whistle. Such signal may be supplemented by a light signal of at least five short and rapid flashes.

6.2.5 Summary

Both the skippers did not navigate with sufficient diligence and used all means in order to avoid a collision.

None of the vessels gave a sound signal, although this could have been done without great efforts. The skipper of SY ALIADO was staying on the forecastle with a hand foghorn, and on board the SY KATTEGAT the actuation for the electric signal horn is located in the area of the control stand.

The statements relating to the scene of the collision differ. However, due to the prevailing direction of the wind, the position of the mainsail of SY ALIADO and the statements by the witnesses the supposition is obvious that SY ALIADO did not sail on the outermost right border of the fairway.

The evasive action of the SY KATTEGAT to port is not even comprehensible taking into account the background of a routine on board that was not coordinated, lack of experience with this particular vessel as well as little experience with a vessel with steering wheel. The presentation of the sea-bed contour in the chart, following to which a red buoy was positioned directly on the 2 m line, suggesting that only an evading manoeuvre to port was possible, may have fostered the decision for an evading manoeuvre to port, however this cannot justify that manoeuvre. As a matter of principle, an evading manoeuvre in case of opposite courses should be performed to starboard, that is, into the free space on sea. This is completed by Rule 14 of COLREG for manoeuvres of power-driven vessels exclusively into the free space on sea:

Rule 14 – Head-on-Situation

(a) *When two power-driven vessels are meeting on reciprocal or nearly reciprocal courses so as to involve risk of collision each shall alter her course to starboard so that each shall pass on the port of the other.*

(b)

- (c) *When a vessel is in any doubt as to whether such a situation exists she shall assume that it does exist and act accordingly.*

Commentary by Hilgert/Schilling on Rule 14 (a):

1. The provision of Rule 14 prescribes for both power-driven vessels on opposite courses with an existing risk of collision that both of them have the obligation to make way to starboard, giving the signal for an alteration of course – 1 short sound – (according to Rule 34) to starboard, so that they pass each other clearly port to port. Therefore the rule is also called “rule on the obligatory rudder position”.

And the commentary on Rule 14 (c):

In case of uncertainties as to the interpretation of Rule 14, this point of the rule shall ensure that vessels sailing ahead or approached ahead are always given way for by means of an alteration of course to starboard.

The most dangerous event in a situation of opposite courses is an alteration of the course to port, which possibly might invalidate the effect of the manoeuvre of the other vessel.

In case of rough sea or of vessels with bad steering properties, e.g. which are unstable when yawing, it is often hard to perceive whether or not the meeting vessel has already fulfilled her obligation to give way.

If on one's own vessel an alteration of course to starboard has already been made according to the rules, this alteration of course must resolutely be maintained. One must not get confused and wavering if the opposite vessel in her turn is yawing or does not alter her course to starboard, but must even more turn one's own vessel to starboard. It would be a gross sailing mistake if one now would alter the course to port, i.e. turning the vessel in the direction of the meeting vessel, thus showing her the other navigation light. If the meeting power-driven vessel in her turn does not alter her course to starboard in time, the meeting power-driven vessel must be reminded of her partial evading obligation by

- a warning signal (at least 5 short sounds quickly following each other),
- flashing fire and/or bang signals,
- a call via VHF

and, if required, one must turn one's own vessel even sharper and more resolutely to starboard. In no case however, it is allowed to alter the course of one's own vessel to the other side (port), thus directly heading to the meeting vessel.

6.3 Charts

On board the SY KATTEGAT it was navigated according to the chart S5A of the NV publishing company. In the area of the fairway Rudkøbing Løb, this chart has not been drawn according to the sounding data by the Royal Danish Administration of Navigation and Hydrography. In the area directly south of the scene of the collision the 2 m line in this chart is drawn directly near the limit of the fairway. The skipper's decision to make way to port is partly comprehensible in view of the representation in this chart. When using this chart, the conclusion is obvious that on the line of the buoys or close to the buoys, respectively, evading to starboard with a draught of 2 m would inevitably result in a grounding. However, according to the sounding data and the representation in other charts, the distance to the next shallow water area of less than 2 m is still about 90 m.

On the German market, three sets of charts for leisure crafts are available for this district by different manufacturers. The positions of the buoys laid out, which are important for the navigation, have been stated correctly in the compared charts by all manufacturers. On the other hand, the type of buoys has only been stated correctly in the chart by one manufacturer.

Approved training vessels, according to the Regulation for Training Vessels, have the duty to take with them the charts and maritime manual necessary for the respective voyage in the version last amended before starting the voyage. This presupposes a correction mechanism being held out for these charts and sounding data, types of buoys and positions etc. being integrated into the delivered charts as well.

The use of a charts with a scale of 1:20.000 is better than the representation in the scale 1:30.000. A detail chart with the even higher resolution of 1:15.000 can always be recommended as the information is better due to the scale. Already with respect to the very serious marine casualty No. 203/04 – sinking of SY ALLMIN and two yachtsmen drowned on June 29th, 2004, east of Rügen – the BSU had issued the according to safety recommendation on this problem, thus in particular on the use of the charts:

The Bundesstelle recommends

the skippers, for the avoidance of a grounding the observation of sea-bed contours and the respect of fairways depending on:

- *the draught*
- *the navigation equipment*
- *the scale of the chart used, **always using the scale with the highest resolution possible***
- *the weather conditions and*
- *the behaviour of the boat in seaway*

6.4 Type of business “Training Vessel”

In the Regulation on the Safety of Ships (SchSV) of September 1998, § 6 - safety standard in special cases – defines a training vessel as follows:

Vessels on which a maximum of twelve persons are trained as masters of leisure crafts (training vessels).

Thus, according to SchSV presently in force with additions and amendments, leisure crafts can be used as training vessels. § 6 - safety standard in special cases – now reads as follows:

....

4. *vessels which have been built exclusively for sport or leisure (leisure crafts) and are used within the scope of a professional use for sports or leisure with a maximum of twelve persons.*

5. *Other leisure crafts, on which a skipper or one or more crew members are employed against a valuable consideration.*

....

7 *Special vessels, subdivided into*

.....

c) training vessels on which a maximum of twelve persons are trained to become skippers of leisure crafts.

d) training vessels that have been built for sport or leisure and on which a maximum of 12 persons is trained to become skippers of leisure crafts or for similar sport and leisure purposes.

The professional use is defined in the Regulation on the use of leisure crafts and water motor bikes as well as their leasing and professional use in coastal waters (Regulation on Leisure Crafts (Sea) - (SeeSpbootV) – dated 29 August 2002) in § 2 – Definitions. Within the meaning of this regulation:

.....

6. *Professional Use*

is a use of leisure crafts for a training as skipper of leisure crafts or for similar sport and leisure purposes aiming at profit-making.

Thus, a boat’s certificate cannot be issued according to the SeeSpbootV if the leisure craft is hired out with the provision of a skipper or a crew or for the purpose of a professional use.

For training vessels that are used in this manner, a vessel safety certificate by the See-BG must exist according to § 52 a SchSV as well as § 14 SeeSpbootV.

In case of so-called Ausbildungstörns (training cruises) or Kojenchartertörns (bunk charter cruises) with the provision of a teacher and skippers and a daily charter price per person of almost 100.-- € as well as the recommendation to take out a policy of an insurance against a cancellation of the voyage, one may, as a rule, assume that in case of “club yachts” as well a professional use with profit-making is concerned.

If the operation of the club/business suggests that the training in the sailing school is run professionally and profit-making, it is not comprehensible why sea-going training yachts are not licensed as training vessels according to the Regulation for Training Vessels.

A use as a training vessel that is not professional and without profit-making according to § 2 para 6 – professional use – of the Regulation on Leisure Crafts (Sea) can only apply to sailing associations or sailing clubs, which e.g. within the scope of their promotion of young talents or of social work for the youth run sailing yachts in basic and advanced training, whereas the main purpose of the sailing associations or clubs remains a union of several owners of vessels.

The SY KATTEGAT has no licences and certificates according to the Regulation for Training Vessels. The lack of these documents did not promote the accident, nevertheless, for this “association yacht” the issuance of a safety certificate for training vessels according to § 52a SchSV should be applied for.

7 Safety Recommendations

7.1 Sailing Schools, Schools for Leisure Crafts and Skippers

The Federal Bureau of Maritime Casualty Investigation recommends to even more call the attention to the national provisions in foreign waters and to the Rules for collision prevention (COLREG) in the training of aquatic athletes. In particular the evading rules for crossing and reciprocal courses have to be obeyed.

In order to call the attention to the situation, in case of risk of collision it must be recommended to use the sound signal equipment or radio system in time.

7.2 Manufacturers of Charts

The Federal Bureau of Maritime Casualty Investigation recommends the manufacturers of special charts for recreational shipping to pay even more attention to the fact that in particular the shallow water zones of less than 4 m are shown exactly according to the sounding data. In particular recreational shipping is dependant upon a true representation of details, e.g. in order to leave the fairway when cruising or to seek the cover of the shore when there is too much wind.

The Federal Bureau of Maritime Casualty Investigation recommends that especially in foreign waters specific data of the estuary and the types of buoys with the corresponding top signs should be marked according to the instructions, as e.g. the designation of a buoy with numbers or letters, like in German waters, is not always given.

7.3 Regulation on Leisure Crafts (Sea)

The Federal Bureau of Maritime Casualty Investigation recommends the Federal Ministry of Transport, Building and Urban Affairs, to amend the § 2 para 6 – professional use – of the Regulation on Leisure Crafts (Sea) in such a manner that a professional use of a leisure crafts for the training is already given with the sole fact that a not honorary skipper, a trainer or a crew is provided. The present wording that a professional use of leisure crafts is only concerned if the use for a training is aiming at profit-making does not seem sufficient for the definition of a professional use.

8 Sources

- Witnesses' statements
- Photos by the owners
- Brochures of the German Yacht Association (Deutsche Hochseesportverband "Hansa" e.V. (DHH)) for the years 2005 and 2006
- Official Leisure Charts, series 3003, edition of 2005, by the BSH
- Leisure Charts Kiel Bay with courses around Fünen], edition of January 2005, by Publishing Company Nautische Veröffentlichung Verlagsgesellschaft mbH, Arnis
- Delius Klasing Leisure Charts — Set 1], corrected versions by 04/2005
- Sailing directions for the Baltic Sea by DSV publishing company; ISBN 3-88412-355-6
- Decision by the Bundesoberseeamt W 9/90 dated 12.12.1990
Cargo Ship "ACHAT"/Passenger Ferry "OSLO VI", collision in the Oslo-Fjord on 3.7.1989
- [Preventing Collisions at Sea); A commentary to the International Regulations for Preventing Collision at Sea
Hilgert – Schilling; ISBN 3-89491-200-6
- International Regulations for Preventing Collisions at Sea
Capt. Pierre Deseck; ISBN 0-900133-11-2
- Records of the Marine Insurance and Safety Association)

9 Annex to the Opinions

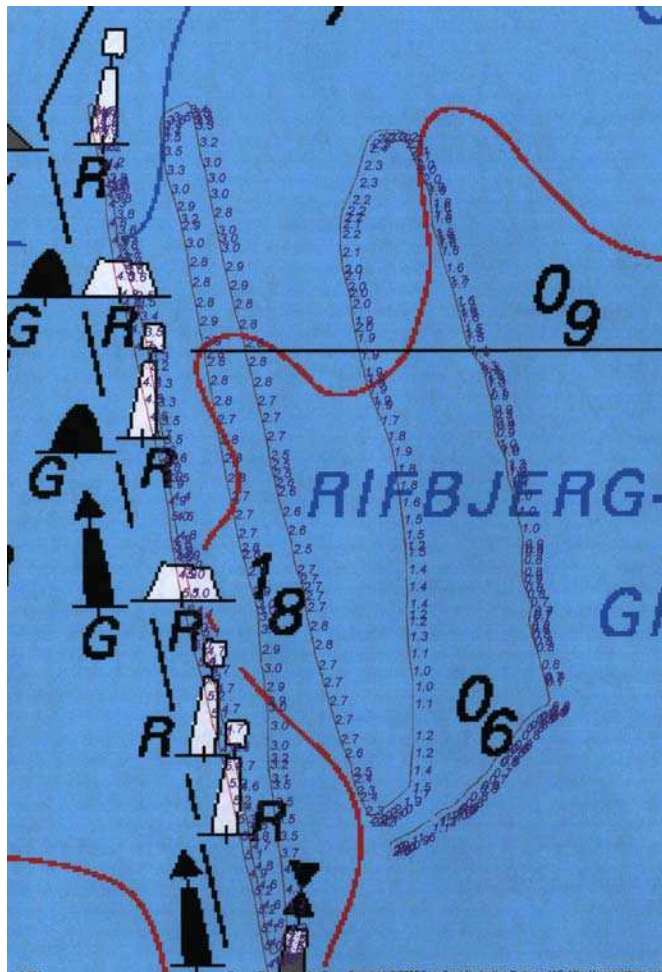
According to § 15 para 1 SUG in conjunction with § 17 para 2 FIUUG, well-founded essential comments are taken into consideration in the investigation report. Accordingly, individual statements are shown in the following. As far as comments differing from the draft of the investigation report have been confirmed by additional investigations by the BSU or by records, respectively, these are integrated into the investigation report at the appropriate places without special emphasise.

Excerpts from the lawyer of the firm of Nautische Veröffentlichungen Verlagsgesellschaft mbH :

2. Incorrectness of the Actual Measures Stated

....

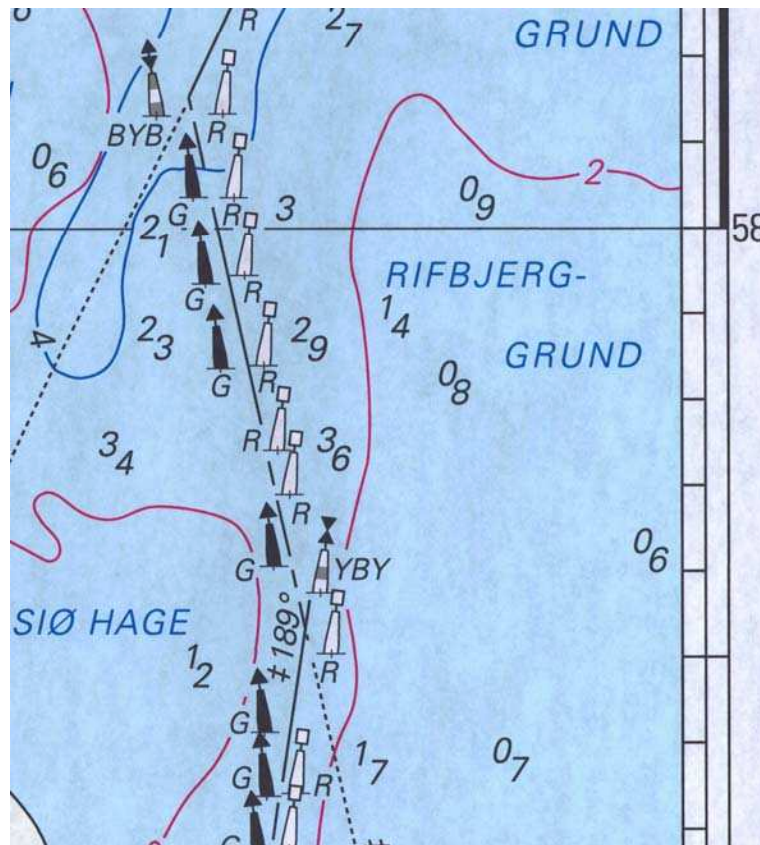
- a) *Our client has revised the Rudkøbing Løb area in a new control in particular with respect to the sea-bed contours in the Rifbjerg-Grund area. In the annex, we enclose a copy of the sounding performed on 07.06.2006 in a detail view of the chart valid so far.*



Hence results that the sea-bed contours in all three charts (Delius Klasing, BSH and nautical publications) in the relevant area are not correct. The shallow water area of 1.8 m shown in the chart of the BSH (south-east of the first port shoal buoy of Naversgrund Ost) does not exist (this shallow water area is also shown in the chart by Delius Klasing Verlag); the sounding data show a depth of the water of 2.8 m.

.....

- d) The course of the 2 m line in our client's chart does not correspond to the data of the Royal Danish Administration of Navigation and Hydrography, however, the details registered there are not correct either. We submit the chart corrected based upon the survey with the most recent sea-bed contours as Annex 2.



3. Need of Correction

- e) Our client has corrected her chart as shown above. A reference must be included that the chart of NV-Verlag has been updated in the meantime.