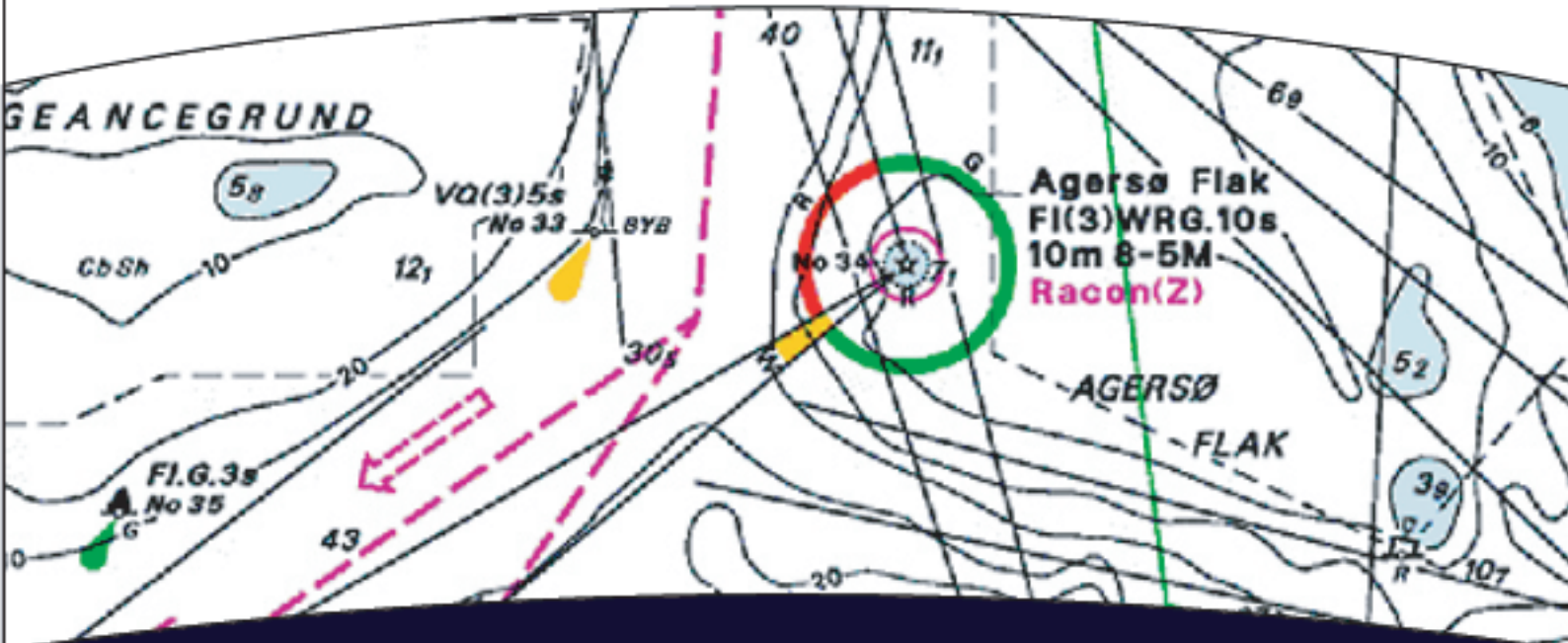


# Marine Accident Report



BERGITTA /  
MSC EYRA  
Collision  
24 October 2004

The division for  
Investigation of  
Maritime Accidents

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## **Casualty report issued July 11, 2005**

**Case: 200503238**

The final casualty report will be available on our homepage: [www.dma.dk](http://www.dma.dk).

### **The Division for Investigation of Maritime Accidents**

The Division for Investigation of Maritime Accidents is responsible for investigating accidents and serious occupational accidents on Danish merchant- and fishing ships. The Division also investigates accidents at sea on foreign ships when Danish interests are involved.

### **Purpose**

The purpose of the investigations is to clarify the actual sequence of events leading to the accident. With this information in hand, others can take measures to prevent similar accidents in the future.

The aim of the investigations is not to establish legal or economic liability.

The Division's work is separated from other functions and activities of the Danish Maritime Authority.

### **Reporting obligation**

When a Danish merchant- or fishing ship has been involved in a serious accident at sea, the Division for Investigation of Maritime Accidents must be informed immediately.

**Phone: 39 17 44 00**  
**Fax: 39 17 44 16**  
**E-mail: [oke@dma.dk](mailto:oke@dma.dk)**

**Cell-phone: +45 2334 2301 (24 hours a day).**

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# 1 Summary

MSC EYRA was southbound in the Great Belt on a voyage to Riga.

BERGITTA was northbound in the Great Belt on a voyage to Rotterdam with a cargo of 100,000 tons of crude oil. On board BERGITTA were two pilots, who should assist the ship through Danish waters until the Skaw.

At about 2200 hours on the 24<sup>th</sup> of October 2004 both ships were heading towards the Agersoe Flak area.

Both ships had reported to VTS Great Belt and were within the VTS area.

There had been changeable visibility in the area. Before and in the connection with the collision the visibility was restricted – according to the involved persons a visibility of 0.5 – 0.8 nautical miles.

On the ships the bridge teams became aware of each other's presents on the radar and it was ascertained that the ships were going to meet each other in the area off Agersoe Flak.

Initially it was MSC EYRA's intention to pass ahead of BERGITTA and continue southward via route-H.

The pilot on BERGITTA called MSC EYRA on VHF channel 16, when MSC EYRA was in the area off Vengeancegrund L/H. On VHF channel 6 it was agreed to pass port-to-port. This agreement was confirmed at a 2<sup>nd</sup> communication between the ships.

The relative speed between the ships was very high especially when taking the prevailing circumstances and conditions into account. Thus the situation developed rapidly from the time when the communication was initiated and until at close-ship-situation developed off Agersoe Flak.

The ships collided at approximately 2218 hours.

## 2 The Investigation

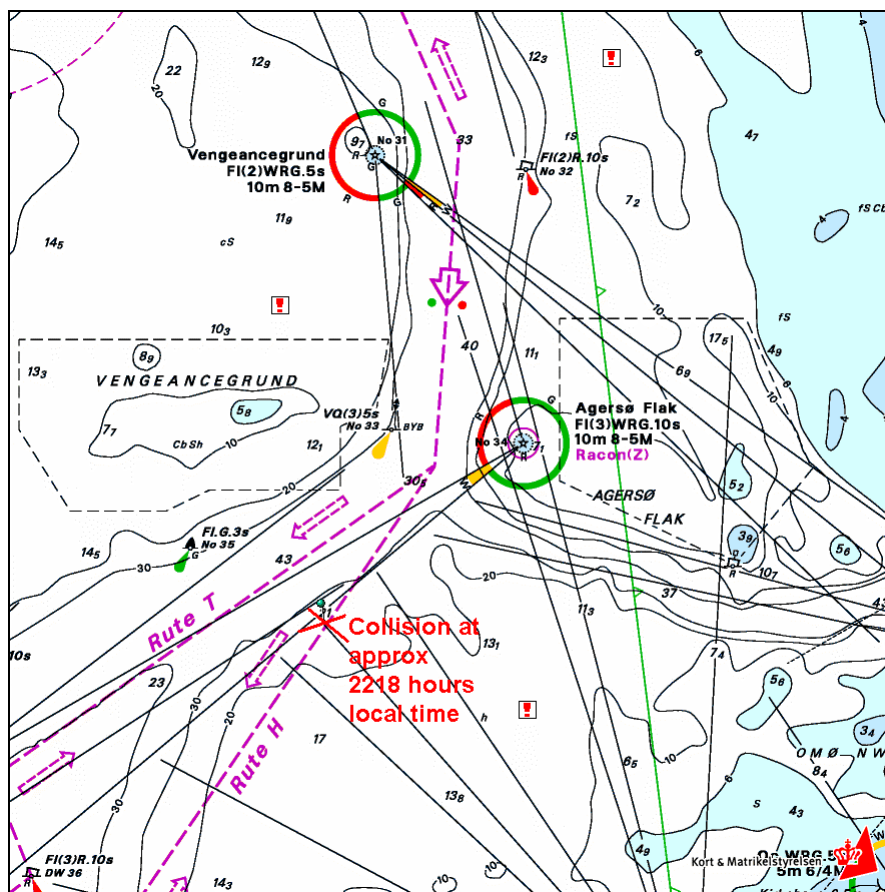
A concerted investigation has been carried out by the Danish Division for Investigation of Maritime Accidents in co-operation with the Norwegian Directorate, in accordance with IMO Resolution A.849(20) adopted on 27 November 1997.

## 3 Factual Information

### 3.1 Casualty data

Type of accident (the incident in details)	Collision
Character of the accident	Serious
Time and date of the accident	24 October at approx. 2218 hours (UTC+2)
Position of the accident	55°11,55' N 011°05,00' E

Scene of the accident:



Extract from chart INT 1369 (chart 143)

Area of accident	Southwest of Agersøe Flak
Injured persons	None
Evacuation of injured persons	None
Ship abandoned (usage of either rescue boat or fleet)	No
IMO Casualty Class	Serious

### 3.2 Navigation Data

#### BERGITTA

Stage of navigation	Narrow waters
Port of departure	Gdansk
Date and time of departure	October 23, 2004 at 1600 hours
Maximum draft at the time of the accident	14.88 m
Pilot on board	Yes

#### MSC EYRA

Stage of navigation	Narrow waters
Port of departure	Antwerp
Date and time of departure	October 22, 2004 at 2242 hours
Maximum draft at the time of the accident	8.70 m
Pilot on board	No

### 3.3 Ship data

Name	BERGITTA	MSC EYRA
Home port	Grimstad	Panama
Call sign	LAOH5	H3FW
IMO No	9197715	8201648
Official No		31836 - PENT
Flag State	Norway	Panama
Construction year	1999	1982
Type of ship	Tanker	Container
Tonnage	56,207 GT	21,586 GT
Classification Society	DNV	Bureau Veritas
Length overall	239.00 m	203.06 m
Engine power	12.221 kW	15.887 kW
Hull construction	Steel – double hull	Steel
Regulation	SOLAS	SOLAS



**BERGITTA**



**MSC EYRA**

### 3.4 Weather data

Wind – direction and speed	Variable 5-10 m/s
Current	Southward 1-2 knots
Visibility	Poor (0.5– 0.8 miles)
Light/dark	Dark

### 3.5 The Crew

#### **BERGITTA**

Number of crewmembers	21
Pilots	2
Number of crewmembers certified to act as bridge watch	4
Bridge Watch	3-shift
Minimum Safe Manning	14  4 navigators incl. master 3 engineers 7 other crewmembers
Bridge Team	Age, Certificate of Competency, other certificates, training, experience.
Duty pilot	The pilot qualified as a mate in 1971 and has been employed on large vessels in Danish shipping companies as mate up to 1976 and as master from 1976 to 1980 as master. Since 1980 he has been employed as pilot, the last 22 years at Skaw Pilot Station as pilot in Route T.
Master	The master, age 59, was qualified as mate in 1974 and has been employed in Norwegian shipping companies on tankers, many of which were of similar size as the BIRGITTA. He was appointed master for the first time in 1982 and has been master of BERGITTA since it was built in 2000. On this shift the master signed on October 8, 2004.
Third officer	The 3rd officer, age 28, held a mate certificate from September 2003. Prior to this he had been employed as cadet on two other tankers for a total period of 28 months and 10 days.  The 3rd officer signed on BIRGITTA on 5 august 2004 and this was his first contract as mate. It was his first passage in the Great Belt.
Helmsman (AB)	Age 60

**MSC EYRA**

Number of crewmembers	26
Number of crewmembers certified to act as bridge watch	4
Bridge Watch	3-shift
Minimum Safe Manning	14  3 navigators incl. master 3 engineers 8 other crewmembers
Bridge Team	Age, Certificate of Competency, other certificates, training, experience.
Master	<p>The master, age 46, has been in the company for 15 years.</p> <p>MSC EYRA was his first ship as master.</p> <p>The master signed on MSC EYRA 30 September 2004 and this was his third passage through the Great Belt. Pilot was not used on either of the passages.</p>
Third officer	<p>The 3rd officer, age 29, finished the maritime officers school in marts 2002. He was certified as - and entitled to serve in the capacity of "officer in charge of a navigational watch". (OOW Deck). This was his first contract in the company.</p> <p>The 3rd officer signed on MSC EYRA February 6, 2004 and had been trough the Great Belt more than 30 times in the period February – October.</p>
Helmsman (AB)	<p>The AB, age 47, signed on in February 2004 and he had been on the vessel for several contracts.</p>



## 3.6 Narratives

### MSC EYRA

*The following is based on verbal and written statements from the master and the 3<sup>rd</sup> officer, information from relevant charts and logbook extracts etc. given to the Danish Investigation Division, on 26 October 2004, on board MSC EYRA in the port of Aarhus, Denmark.*

MSC EYRA departed Antwerp on 22 October at 2242 hours on a voyage to Riga. Upon departure the maximum draught was 8.70 meters.

A total of 480 units (20' and 40' containers) had been loaded. Total weight of containers was 7847 MT.

Hazardous cargo approx. 119 tons – IMO Class 2 – 2.3 – 3 – 5.1 – 6.1 – 8 and 9.

The bridge team consisted of the master, the 3<sup>rd</sup> officer and an AB (helmsman)

On the 24 October, during the passage of the Great Belt, the master had been on the bridge from approx. 1800 hours.

The bridge watch was divided between the three officers on board. The 3<sup>rd</sup> officer took over the watch at 2000 hours.

The vessel was steered by hand through the entire passage in route-T.

The duty as helmsman was shared between three ABs – maximum two hours steering.

At 2100 hours the 3<sup>rd</sup> officer informed the Great Belt Traffic that the vessel had entered the VTS area southward bound. The Great Belt Bridge was passed without any problems. Visibility in the area of the bridge was very poor (2-3 cables)

There was not much traffic in the area.

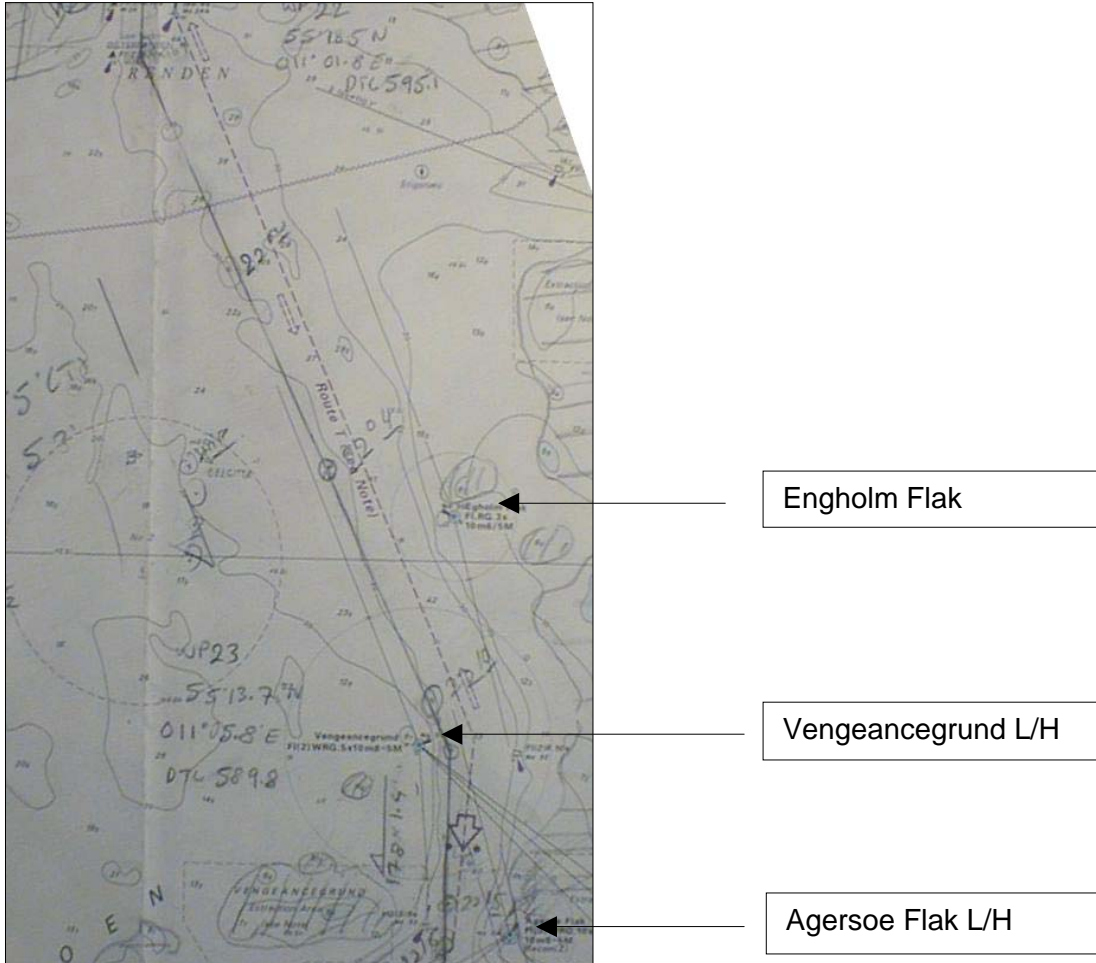
At 2200 hours the vessel was heading towards Vengeancegrund L/H. The gyro course was 155°.

At approx. that time, there was a change of helmsman. The relieving helmsman repeated the course "one - five - five"

The vessels speed was approx. 18 knots.

The wind was NE force 3-4 (beaufort). South going current 1-2 knots. The visibility was still poor but had, however, improved to about 7-8 cables.

Positions from the GPS were marked in BA chart 938 (INT 1369) with intervals of approx. 5 minutes – see *chart extract below*.



Extract from BA chart 938

When MSC EYRA passed the area off Engholm Flak, the 3<sup>rd</sup> officer observed a target on the radar approx. 5 points on starboard bow at a distance of 4-5 nautical miles (miles). The target later proved to be BERGITTA. The target was plotted. Target speed was 13-14 knots.

Shortly after 2210 hours at WP 23, Vengeancegrund L/H (No. 31) the 3<sup>rd</sup> officer gave the helmsman the order to turn starboard to course 178°. The master was monitoring the navigation.

The ships whistle was set on "AUTO" fog signal – one long signal every 2 minutes.

Three VHF sets were in use – two on channel 16 and one on VTS channel 11.

Normal navigation lights for engine-powered vessel with a length of more than 50 m were on.

According to the 3<sup>rd</sup> officer, calculations from the ARPA showed that MSA EYRA would pass ahead of the target with a CPA of 0.4 miles.

At 2215 hours MSC EYRA was off Agersoe Flak and close to the next WP (24). It was the intention to keep a southerly course past the waypoint and pass in front of the other vessel (BERGITTA) and then continue southward via route-H.

Between 2215 – 2216 hours, two calls were made from BERGITTA – at first the vessel identified itself as a deep draught vessel and instructed them to keep clear – and shortly after BERGITTA requested that the vessels should pass port to port (red to red). The calls were initiated on VHF channel 16 and then continued on channel 6.

The 3<sup>rd</sup> officer on MSC EYRA saw BERGITTA visually at approx. the same time as they were in radio contact. He saw the two masthead lights of BERGITTA, and the lights were corresponding with the information on the ARPA radar. BERGITTA was 4-5 points on the starboard bow - distance approx. 8 cables.

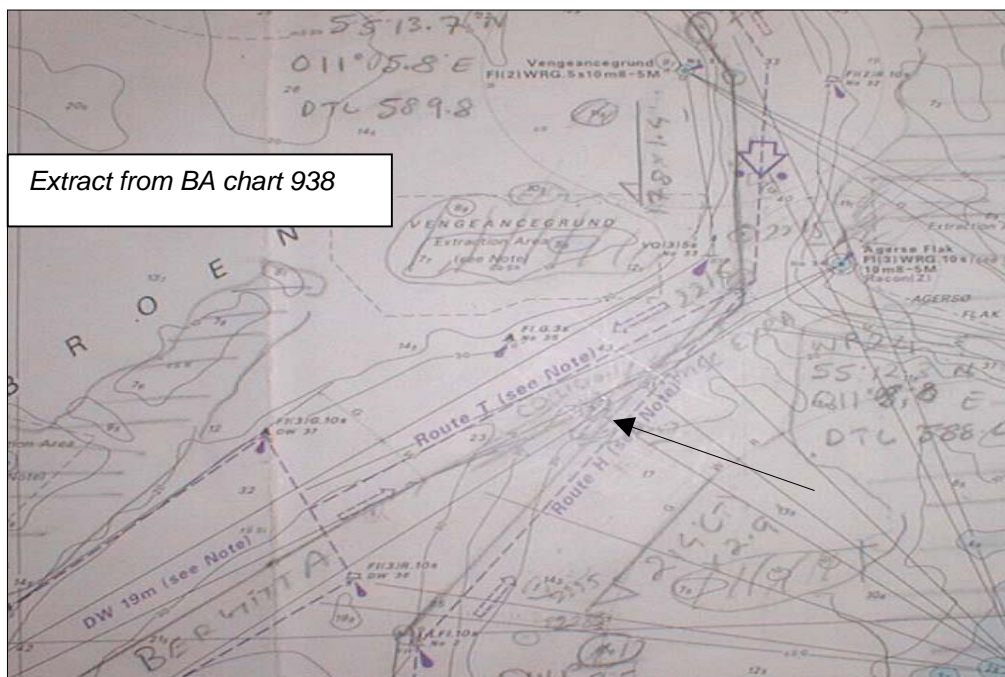
The 3<sup>rd</sup> officer may have seen BERGITTA prior to the radio communication. He saw a faint light in a distance of 1.4 miles. He is not sure about the sequence of the advets with respect to the visual observations and the communication on the VHF.

After passing WP 24 - shortly after 2216 hours - the master took over the command and ordered “hard a starboard”. The speed was maintained in order to obtain maximum manoeuvrability.

Based on the information from BERGITTA the master assumed that BERGITTA also would turn to starboard. BERGITTA did, however, not turn – not until the very last moment.

During the manoeuvre on MSC EYRA, the 3<sup>rd</sup> officer called BERGITTA several times and said “turn starboard”

At 2220 hours the vessels collided in position: 55°11,44´ N 011°04,6´ E.  
See marking on the chart extract below



## BERGITTA

*The following is based on written statements from the master and the 3<sup>rd</sup> officer, information from relevant charts and logbook extracts etc.*

BIRGITTA departed from Gdansk on 23 October 2004 at 1600 hours bound for Rotterdam. The cargo consisted of 100,294.097 MT (vac/gross) Russian export blend crude oil. Upon departure, the vessel carried 610 tons of heavy fuel oil and 52,3 tons diesel oil.

The draught upon departure was 14.88 meters even keel.

The bridge watch was divided between the three officers on board. The 3<sup>rd</sup> officer had the watch from 0800 to 1200 hours and from 2000 to 2400 hours.

The master does not have regular watches, but he is normally on the bridge when the vessel is going through narrow waters etc. When a pilot assists the vessel for long time periods, as in this case, the master normally leaves the bridge to rest.

On this passage the vessel had taken aboard two pilots at Allinge, Bornholm on Sunday 24 October at 0642 hours. It was planned that the two pilots should remain on board until the vessel had passed the Skaw.

On Sunday 24 October at 2000 hours the 3<sup>rd</sup> officer took over the watch from the chief officer. At that time the vessel was 2 miles south of "Langelandbælt Syd" lighthouse northbound in route-T.

The pilot had just informed VTS Great Belt of the ship's presence.

The 3<sup>rd</sup> officer stated that the visibility was reasonably good, wind force 3-4 (beaufort), sea state 2-3. The 3<sup>rd</sup> officer did not experience any current affecting the course or manoeuvrability of the vessel.

The master has stated that the visibility was about 0.5 miles at the time of the collision and the wind was SSW force 3.

The 3<sup>rd</sup> officer, the pilot and a helmsman (AB) were on the bridge.

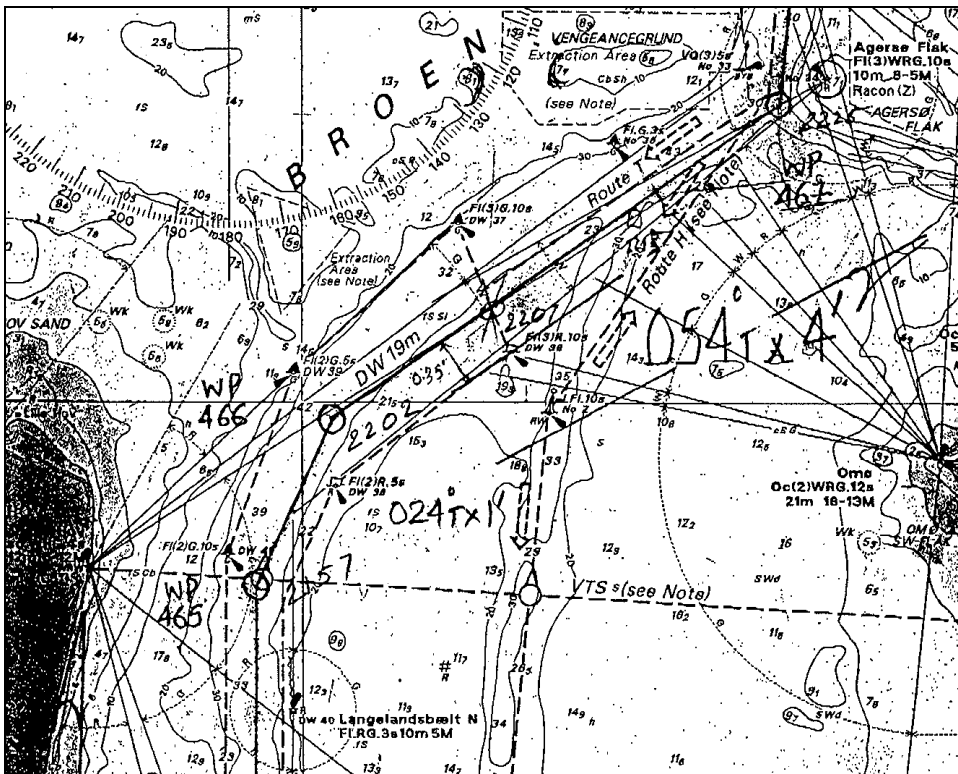
The master states that he was on the bridge most of the evening. Although the master was on the bridge, the 3<sup>rd</sup> officer kept command of the watch all the time.

The vessel was steered by hand and it was doing a speed of 11.8 – 12.2 knots.

According to the 3<sup>rd</sup> officer, it was the pilot who was in charge of the navigation and who also gave the orders to the helmsman.

The 3<sup>rd</sup> officer was checking and monitoring the bridge instruments and the traffic situation on the ship's two radars (both with ARPA). He was only operating the radar in starboard side.

The 3<sup>rd</sup> officer checked and inserted the positions in the chart at all waypoints and in addition regularly between the waypoints – *see chart extract below*.



Extract of BA chart 2597

The captain left the bridge at 2150 hours and went to his cabin.

At the waypoint close to “DW 41”, the position was marked at 2157 hours. At approx. that time, the 3<sup>rd</sup> officer observed a target on the radar in a distance of approx. 6 miles.

The target was acquired on the radar and identified by means of the AIS to be MSC EYRA.

Between 2202 and 2207 hours the, 3<sup>rd</sup> officer noticed that the MSC EYRA was proceeding at 18 knots on a course of 180/181 degrees – according to AIS. Calculations from the ARPA showed that the CPA to MSC EYRA was 0.2 miles or less.

The first communication took place at 2207 hours when BERGITTA turned to course 052° in a starboard bend in the fairway.

The pilot initiated the first communication on channel 16 and then continued on channel 6. The 3<sup>rd</sup> officer overheard the pilot informing MSC EYRA that the vessels were on collision course, and that BERGITTA had draught restriction. The pilot told the MSC EYRA to go more starboard. MSC EYRA asked BERGITTA to maintain course and speed and informed of its intention to turn starboard. During this communication it was also agreed to pass port-to-port. The distance between the vessels at that time was 4.4 – 4.6 miles.

BERGITTA maintained course and speed.

At the time when MSC EYRA passed Vengeancegrund, the bearing to MSC EYRA had not changed. The pilot therefore called MSC EYRA again at 2213 hours.

There were a few exchanges in which the MSC EYRA asked BERGITTA to maintain its course and speed, upon which the MSC EYRA would go to starboard.

The pilot, however, advised that the BERGITTA also should go starboard to make safe passing distance between the two vessels.

The pilot then ordered change of course from 052° to 060°

The distance between the vessels at the time was 1.5 – 1.7 miles.

Both the AIS and the radar indicated that MSC EYRA continued on its course.

As the BERGITTA was changing its course towards 060° and had reached 057°, it appeared that this was not going to be sufficient. The pilot ordered course 068°. At that time the distance between the vessels was 8 cables.

There was a third radio communication. The 3<sup>rd</sup> officer is not sure who initiated it. He believes that the pilot told MSC EYRA to go “hard starboard”. The situation on the bridge was now becoming hectic.

The 3<sup>rd</sup> officer called the master and asked him to come to the bridge.

According to the master, the call was made 2-3 minutes before the collision. He was asked to come to the bridge without any specific reason.

The BERGITTA continued turning starboard and when it reached course 063° the AB was ordered by the pilot to put the rudder amidships.

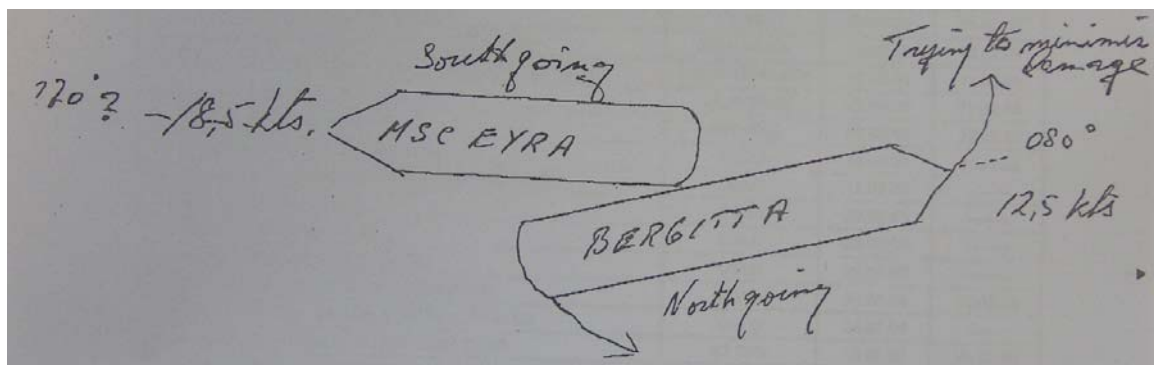
Shortly after the pilot ordered “starboard 20” and immediately after “hard starboard”. This was 2-3 minutes before the collision.

About one minute before the collision the 3<sup>rd</sup> officer heard the pilot order “hard port”. At approx. The same time the 3<sup>rd</sup> officer saw MSC EYRA visually for the first time from the port bridge wing using binoculars.

From the port bridge wing the 3<sup>rd</sup> officer saw both green and red navigation lights from MSC EYRA very close to BERGITTA.

As the master entered the bridge he saw the lights – incl. the red navigation light - from MSC EYRA about 200 meters away and shortly after he heard a loud crash.

According to the master the angle between the vessels was approx. 180° (at almost opposite courses) at the time of the collision.



Sketch made by the master of BERGITTA

*The following is based on written statement from the duty pilot on board BERGITTA*

The pilot went on board BERGITTA on 24 October at 0642 hours off Allinge, Bornholm, together with a colleague pilot. They had planned 6 hours watches until the Skaw. The pilot commenced his second watch at 2000 hours, and he was on the bridge until the collision.

At 2000 hours the 3<sup>rd</sup> mate took over as officer of the watch together with an AB. The vessel was heading north and was hand steered from the passage of Langeland Baelt South L/H and until the collision.

The weather was changeable with a visibility of 2 miles decreasing to about 0.6 miles at the time of the collision. There was no wind and the current was approx. 0.5 knots south. The sea was calm. The vessel proceeded with full service speed, about 12 knots.

Both radars with ARPA were working and in use. The pilot was generally using the radar in the port side of the bridge, and the 3<sup>rd</sup> mate was mostly staying at the radar in the starboard side. The port side radar was set at 3 miles, relative motion and off centre to cover an area ahead of more than 3 miles. From time to time the pilot changed the area to 6 and 12 miles to check for approaching vessels. The gyro, with no corrections, was working. The VHF was set at stand-by at channels 11 and 16.

BERGITTA was showing ordinary navigation lights and three red lights in the mast signifying, that the vessel's manoeuvrability was reduced due to its draught.

About 2.5 miles south of the "Langelandsbælt N" the pilot reported to VTS the identity of the vessel and that the vessel was heading north.

It is the normal procedure with a vessel this size to proceed in the centre line of the fairway, when there are no souths going vessels.

The pilot first noticed the vessel that later turned out to be MSC EYRA, at a time when he changed the radar range to 12 miles. He did not note the time of this or later occurrences, as the 3<sup>rd</sup> mate was tending to this duty. The pilot used the ARPA to plot the vessel. When he switched back to 3 miles, he could no longer see the vessel at the radar. After a short while the ARPA information was presented on the right side of the radar screen, and according to these information MSC EYRA was heading 157° at a speed of 18 knots.

In order to maintain the manoeuvrability of the vessel, the speed of 12 knots was maintained.

After a little while the course was changed to 052° following a turn to starboard of the fairway. At that time the vessel was positioned slightly south of the centre line and remained there in order to make way for the approaching MSC EYRA.

At that time the pilot realised that the vessels would have a close passage. He therefore called MSC EYRA on the VHF just before it reached Vengeancegrunden. He notified that BERGITTA was approaching in the deep-water route with a deep draught compromising manoeuvrability. The person responding on MSC EYRA seemed surprised by the presence of BERGITTA.

Shortly after the pilot noticed at the radar that MSC EYRA changed course to 181°. The pilot again called MSC EYRA and asked for a red-on-red passage. The pilot was of the

opinion that this way the vessels would pass port-to-port as they should in a fairway, if MSC EYRA intended to use the deep-water route.

The pilot also states that MSC EYRA should pass BERGITTA at its aft rather than at its bow, if it intended to use Route H.

MSC EYRA confirmed that it would pass red-on-red.

When the distance between the vessels was approx. 1.6 miles, the pilot noted from the radar/ARPA that MSC EYRA continued at the same heading. The pilot therefore asked BERGITTA to be turned further to starboard for the purpose of giving MSC EYRA more space.

The pilot noted, that MSC EYRA continued too far south of buoy # 33 where the deep water route meets Route H.

Next, MSC EYRA contacted BERGITTA on the VHF. MSC EYRA shouted for BERGITTA to come hard starboard. The pilot replied by asking about the course of MSC EYRA. MSC EYRA responded that it was heading on course 210° still continuing hard starboard. The pilot on BERGITTA then ordered the helmsman hard starboard and ended up at course 090°. This was as far as the pilot dared to turn starboard due to the risk of grounding.

The pilot's first visual contact with MSC EYRA was at a distance of 0.6 – 0.7 miles, when he saw the top light and the red lantern. He realized that they were on collision course so that BERGITTA's port stern would be struck by the port stern of MSC EYRA. He saw that MSC EYRA was still turning hard starboard. The pilot decided to try to swing the stern of BERGITTA out of the way and he therefore ordered hard a port.

At this stage there was no radio contact and no sound signals were given by either part. In BERGITTA, all deck lights were switched on and also the red flashing lights amidships.

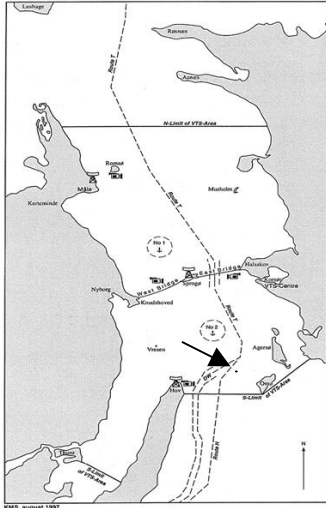
At the time of the collision BERGITTA was in a turn hard to port and its course was approx. 080°. In the opinion of the pilot MSC EYRA was still in a hard starboard turn and heading approx. 270°. The collision angle was approx. 10°. The pilot requested the 3<sup>rd</sup> mate to note the position. After the collision, BERGITTA's speed was first reduced to half ahead, but after a little while it went back to full ahead to assist in turning the vessel towards a northerly course. BERGITTA was then stopped and anchored, and the collision was reported to the Admiral Danish Fleet and to the VTS.



### 3.7 VTS

#### Vessel Traffic Service Great Belt Traffic

The figure below shows the middle part of the Great Belt, the reporting lines which are identical to the boundaries of the VTS area and the approx. position of the collision.



VTS area (source: VTS homepage)

The Admiral Danish Fleet is the VTS authority responsible for the vessel traffic service in the area.

Great Belt Traffic centre (GBT) is based on and operated in accordance with the provisions of the International Maritime Organization's (IMO) Resolution on "Guidelines for Vessel Traffic Services".

The GBT provides an information service to shipping in the area. The service is based on information from radar stations, electro-optic sensors, VHF bearings, radio reports from ships and Danish coastal radio stations and compilation of meteorological and hydrographical data.

The GBT provides information to shipping about specific and urgent situations, which could cause conflicting traffic movements, and other information concerning safety of navigation.

#### VTS system and resources

VTS system consist of following equipment and sites:
One VTS centre located at the Naval station in Korsør
One emergency VTS centre located on the island Sprogø
Three remote controlled radar stations: - one radar station located at Enebjerg on North Fyn, - one radar station and emergency VTS centre located on the central part of Sprogø - one radar station located at Hov on the north-eastern part of Langeland.
Four remote controlled E/O camera sites: - one camera site located on the eastside of the island Romsø, equipped with Infrared- and daylight cameras. - one camera site located on the radar tower at Hov, equipped with Infrared- and daylight cameras.

- two camera sites located on the West bridge, equipped with Lowlight level- and daylight cameras.  
(one camera site covering the south side of the bridge another covering the north side of the bridge)

One guard vessel, VTS 4.



The VTS centre in Korsør is equipped with three (3) independent Operator Consoles (workplaces)

Source: VTS homepage

The GBT is manned 24 hours a day by a team of three persons:  
1 team leader and 2 operators, all experienced navigators.

There are 6 teams all told.

### **Relevant Regulations**

The Danish Maritime Authority, Order No. 86 of 23 February 2004 - *Navigation through the East Bridge and the West Bridge in Storebælt (the Great Belt)*

The international Regulations for Preventing Collisions at Sea (COLREG) are applicable throughout the VTS area.

### **Information received from Great Belt Traffic**

*The following section is based on a report from the duty operator at the time of the collision.*

Weather: SW wind – 5m/s, current south going 1 possible 2 knots, visibility 3 nautical miles in the bridge area.

Both vessels had reported to GBT.

When MSC EYRA was off Vengeancegrund the ship was in contact with BERGITTA for the first time and then several times afterwards.

The communication was performed on VHF channel 16 and 6.

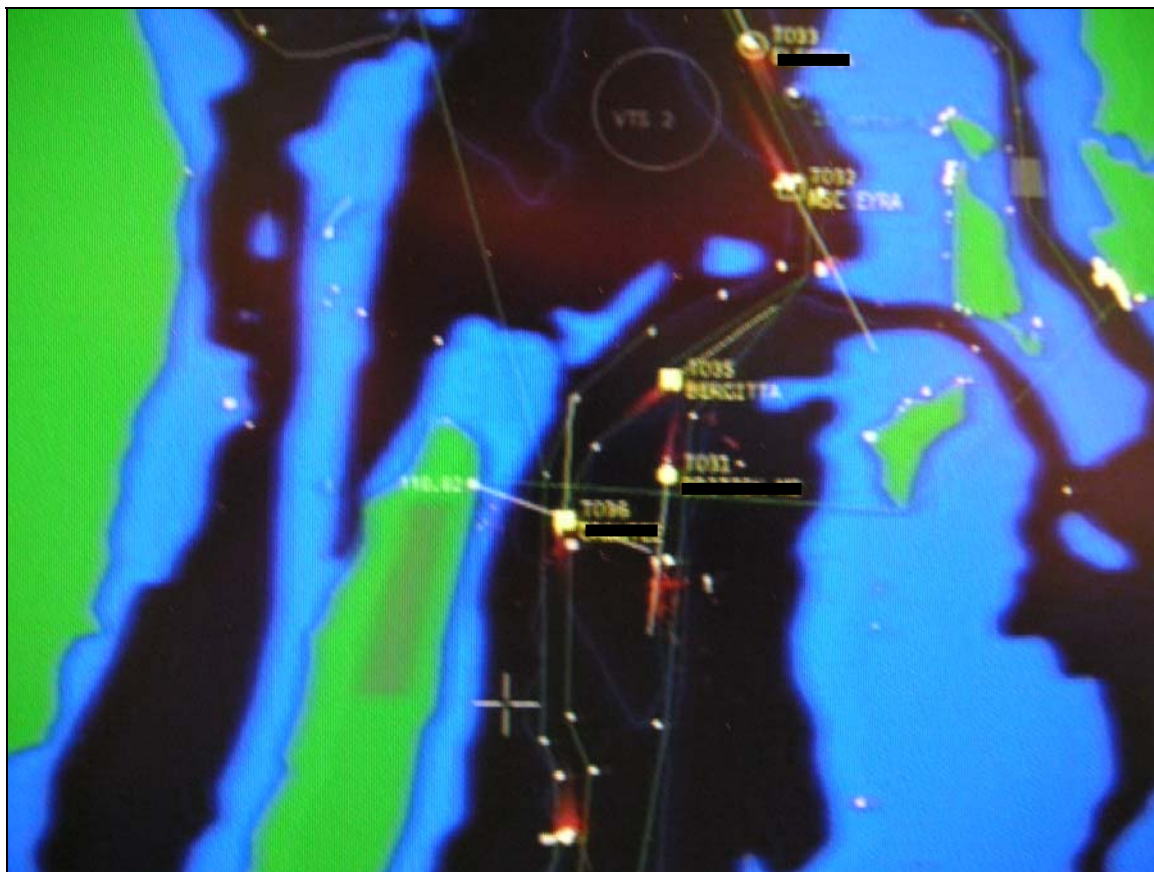
The operator overheard the conversation on channel 6.

On channel 16, it was agreed between the ships to make a port to port passage, when MSC EYRA had passed buoy No 33. This agreement was confirmed a little while later. MSC EYRA passed buoy No 33 with high speed and with strong south going current.

BERGITTA continued with full speed and maintained her course and made an evasive manoeuvre just before the collision.

Collision time was noted at 20.19 UTC.

### ***Radar recordings***



*Recording of radar at 22:10:30 hours local time. Vector: 10 minutes.  
The traffic situation and location of the vessels approx. 7½ minutes before the collision.  
For further details of the area see chart extract in chapter 3.  
The data obtained from the recordings as prescribed below is not to be regarded as exact – e.g. course alterations are shown on the radar with some delay.*

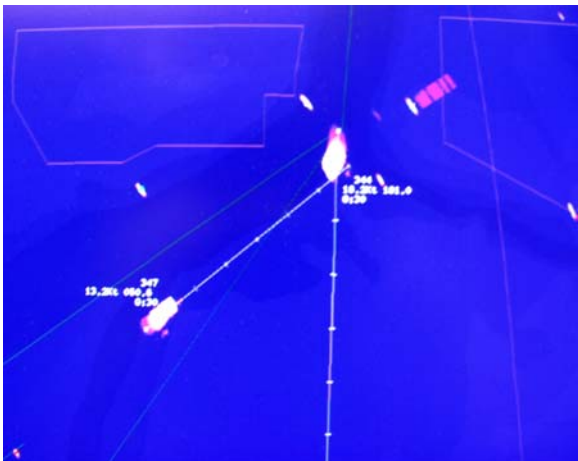
MSC EYRA is close to Vengeancegrund L/H on course 154°, speed 18 – 18.5 knots. The recordings shows that MSC EYRA (the vector) is on a southerly course about 1 ½ minutes later at 2212 hours.

BERGITTA is in the southern part of the DW-route and passes “DW 36” close on its starboard side. Course 052° speed 12-13 knots.

The ships’ relative speed is approx. 30 knots – the vessels are closing in on each other with 0.5 miles / minute.

True bearing between the vessels is 031° / 211°.

## Close up radar recordings of the situation the last three minutes



*Pictures taken of the radar recordings displayed on the VTS equipment.  
Vector: 6 minutes (distance between two dots represent 1 minute). Time: 22:15:41 hours.  
At 1500 hours approx. 3 minutes before the collision the distance between the vessels was about 1.5 NM.*

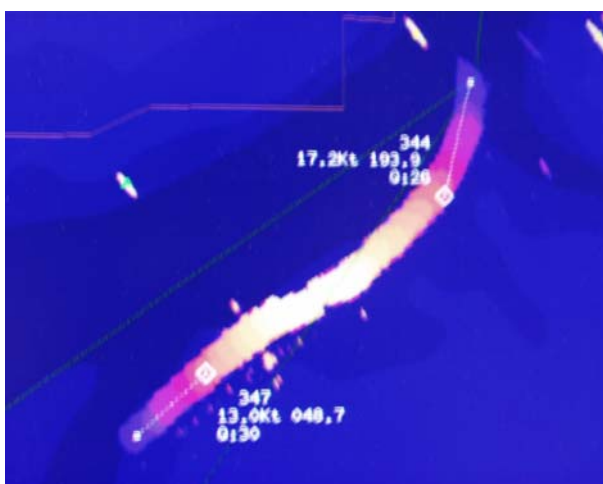
The shown vectors are not in the centre of the targets and can therefore not be regarded as precise. The trail and vector position of MSC EYRA, however, indicates that MSC EYRA has initiated a starboard turn.

MSC EYRA just passed the junction point of the routes. Agersoe Flak L/H with Racon is shown in the top right corner.

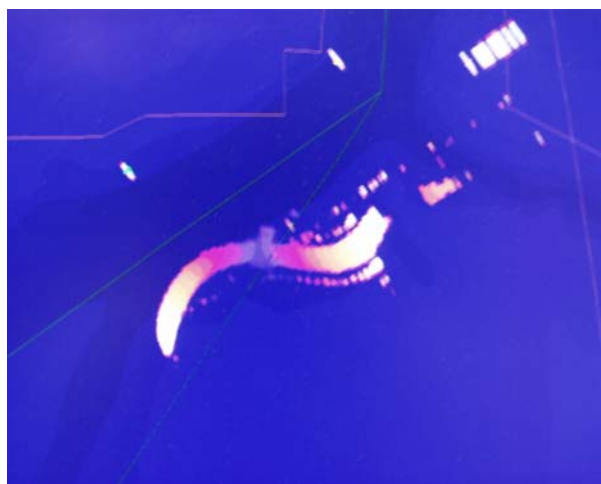
BERGITTA is south of L/B No 35. The dark blue area north of BERGITTA is the deepwater route. According to these recordings BERGITTA is in southern most part of the route.

MSC EYRA is or was about to pass the course line of the BERGITTA in a distance of approx. 1.5 miles.

## Close up radar recordings with trails



*Same starting point as shown above.  
In this picture with 3-minute tails.  
The echoes melt together at approx. 22.18 hours*



*Manoeuvres after the collision.*

**Recording of the communication (Recorded at VTS Storebælt)**

Starting times (UTC+ 2)	Duration (min:sec)	Communication on VHF channel 16	
22:11:50	00:26	BERGITTA: MSC EYRA:  BERGITTA: MSC EYRA:	MSC EYRA ...BERGITTA Yes Sir ... I will pass you on my stern ... I will go a little bit ahead ... and then I will turn to starboard Please go on 6 (six) please 06 (zero six)
22:13.35	00:14	BERGITTA: MSC EYRA:	MSC EYRA channel 6 (six) Channel 6 (six)
22:14:27	00:21	MSC EYRA: MSC EYRA:	BERGITTA you go to starboard please BERGITTA go to starboard – I'm going to starboard
22:14:51	01:01	MSC EYRA:  BERGITTA: MSC EYRA:  BERGITTA: MSC EYRA:  BERGITTA: MSC EYRA:  BERGITTA:	.... ? MSC EYRA calling you – please go to starboard MSC EYRA what are your heading now I am heading 230 (Two-three-zero) you go to starboard, please – starboard, you go to starboard – you go hard a starboard, please – hard a starboard – you go to hard starboard please But that's your fault – you have to turn before Yes ... I told you red-to-red - pass red-to-red - you go hard a starboard right now – hard a starboard please – go to hard starboard please I'm swinging - I'm swinging - I'm swinging Go hard a starboard we pass red-to-red - I repeat hard a starboard – hard a starboard I'm turning - I'm turning - I'm turning
22:18:57	00:12	BERGITTA:	MC EYRA – BERGITTA
22:20:40	00:22	BERGITTA: MSC EYRA: BERGITTA: MSC EYRA:	MC EYRA – MC EYRA – BERGITTA Yes, go ahead 06 (zero six) 06 (zero six)
22:25:25	00:22	MSC EYRA: BERGITTA: MSC EYRA:	BERGITTA, BERGITTA MSC EYRA 6 (six) 06 (zero six)
22:29:43	00:24	VTG GBT:  MSC EYRA: VTG GBT:	MSC EYRA; MSC EYRA VTS Great Belt Traffic Replying MSC EYRA VTS Great Belt Traffic channel 11 (eleven, please)

*VHF Channel 6 is not recorded by the VTS*

**Description of the sequence of the events.**

Time Local	Statement MSC EYRE ( E. )	Statement BERGITTA ( B. )	Statement pilot	Data from VTS Great Belt
2157		B. pass DW 41 E. on radar at distance 6 miles		
2200	E. heading toward Vengeance on course 155° speed 18 knots. Visibility 0.6 miles.			
2205	E. pass Engholm Flak. B. on radar – stb. 5 points – 4-5 miles			
2207		B. pass # 38 – turn to 052°	B. between # 36 and # 37 on course 052°	
2210	E. pass Vengeance (# 31) and change course to 178°. CPA to B. 0,4 miles astern (ARPA).		speed 12 knots. E. slightly N. of Vengeance (distance 4,4 miles) on course 157° speed 18 (ARPA). CPA less than 0.3 miles.	E. off Vengeance (# 31) on course 154° speed 18-18.5 knots. B. pass # 36 on course 052° speed 12-13 knots.
2212				E. is on a southerly course.
2213		Distance to E. 1,5-1,7 miles. Pilot calls E. E. requests B. to maintain course and speed and that E. will turn starboard. Pilot order stb. to 060°.	Pilot calls E. E. agrees on red/red passage.  E. changed course to 181° (ARPA).  E maintains course Pilot requests E. to come more stb. (distance 1.6 NM)	
2215	E. pass Agersoe Flak (# 33). First call from B., who requests red/red passage. E. intend to maintain course until B. has passed.	E. still on course 180°. Distance to E. 8 cables. Master called to the bridge.	E. pass # 33 on course 180°/181°.  E. requests B. to turn stb.  Pilot order hard stb. to 090°.  Distance to E 0.6 – 0.7 NM – hard port	E. just passed # 33 and has initiated a stb. turn. Distance between the ships approx. 1.5 NM B. is just south of # 35.  22:15:41 hours E. is about to cross B.'s course line
2216	See B. visual stb. 4-5 points, distance 8 cables.			

Time Local	Statement MSC EYRE ( E. )	Statement BERGITTA ( B. )	Statement pilot	Data from VTS Great Belt
2216 (cont.)	Master takes over and order hard stb. E. calls B. several times requesting B. to turn stb.			
2217		B. is turning stb. then midship and then hard port. Sees E.'s red and green lanterns.	Pilot orders hard port.	
2218			Collision	The echoes of E. and B. melt together. Both vessels are in a stb. turn.
2220	Collision			

### 3.8 Risk Analysis of Navigational Safety in Danish Waters

A risk analysis for the "Agersoe Flak" area was concluded in February 2003 by a consulting engineering firm on behalf of the Royal Danish Administration of Navigation and Hydrography and the Danish Maritime Authority.

### 3.9 Consequences of the collision



*MSC EYRA – port side quarter*

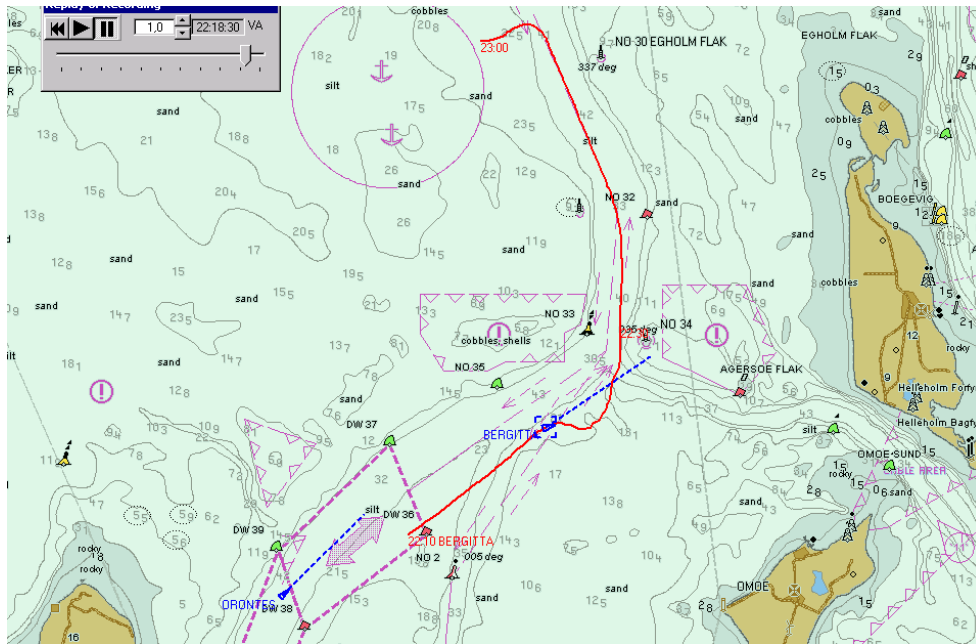


*BERGITTA - port side*





### 3.10 Automatic Identification System



*BERGITTA's track in accordance with the AIS test facilities of the Danish Administration of Navigation and Hydrography.*

There is no AIS information from MSC EYRA. Nothing was detected.

### 3.11 *Survey after the collision*

Both vessels were ordered to an anchorage in the Great Belt by the Admiral Danish Fleet and detained by the Danish Maritime Authority until the Classification Societies had verified the seaworthiness of the vessels.

## 4 Analyses

### **Summary of the sequence of events**

At approximately 2157 hours, according to the officer on BERGITTA, BERGITTA passed buoy DW 41 and he observed MSC EYRA on the radar.

At approximately 2205 hours, according to the officer on MSC EYRA, MSC EYRA passed Egholm Flak and he observed BERGITTA on the radar.

At approximately 2212 hours, the pilot on BERGITTA called MSC EYRA for the first time on VHF channel 16 (according to the recordings from VTS Great Belt). The officer on MSC EYRA replied

*"I will pass you on my stern...I will go a little bit ahead...and then I will turn to starboard".* According to the pilot, they agreed on a port-to-port passage on VHF channel 6. According to the radar recordings, MSC EYRA had passed the Vengeance ground at that time.

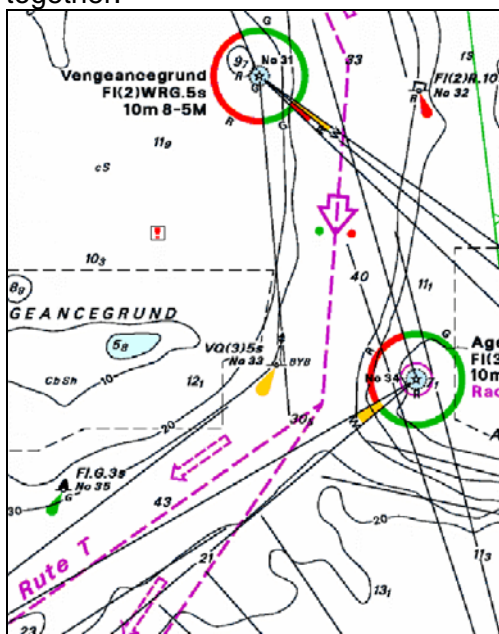
At approximately 2214 hours, the pilot called MSC EYRA again – according to the VHF recordings. According to the pilot, the agreement on a port-to-port passage was repeated and confirmed on VHF channel 6.

At approx. 2215 hours, MSC EYRA had buoy # 33 on its starboard beam on a southerly course with a speed of 18 – 18.5 knots. (SOG)

At approximately 2215 hours, MSC EYRA communicated: *"BERGITTA go to starboard – I'm going to starboard"*.

Shortly after 2215 hours, it appears from the radar recordings that MSC EYRA's course (COG) began to alter to starboard. At this time, MSC EYRA had passed the centreline in route-T and it was heading to the side of the route where the approaching ships sails.

At approximately 2218 hours, according to the radar recordings, the echoes melt together.



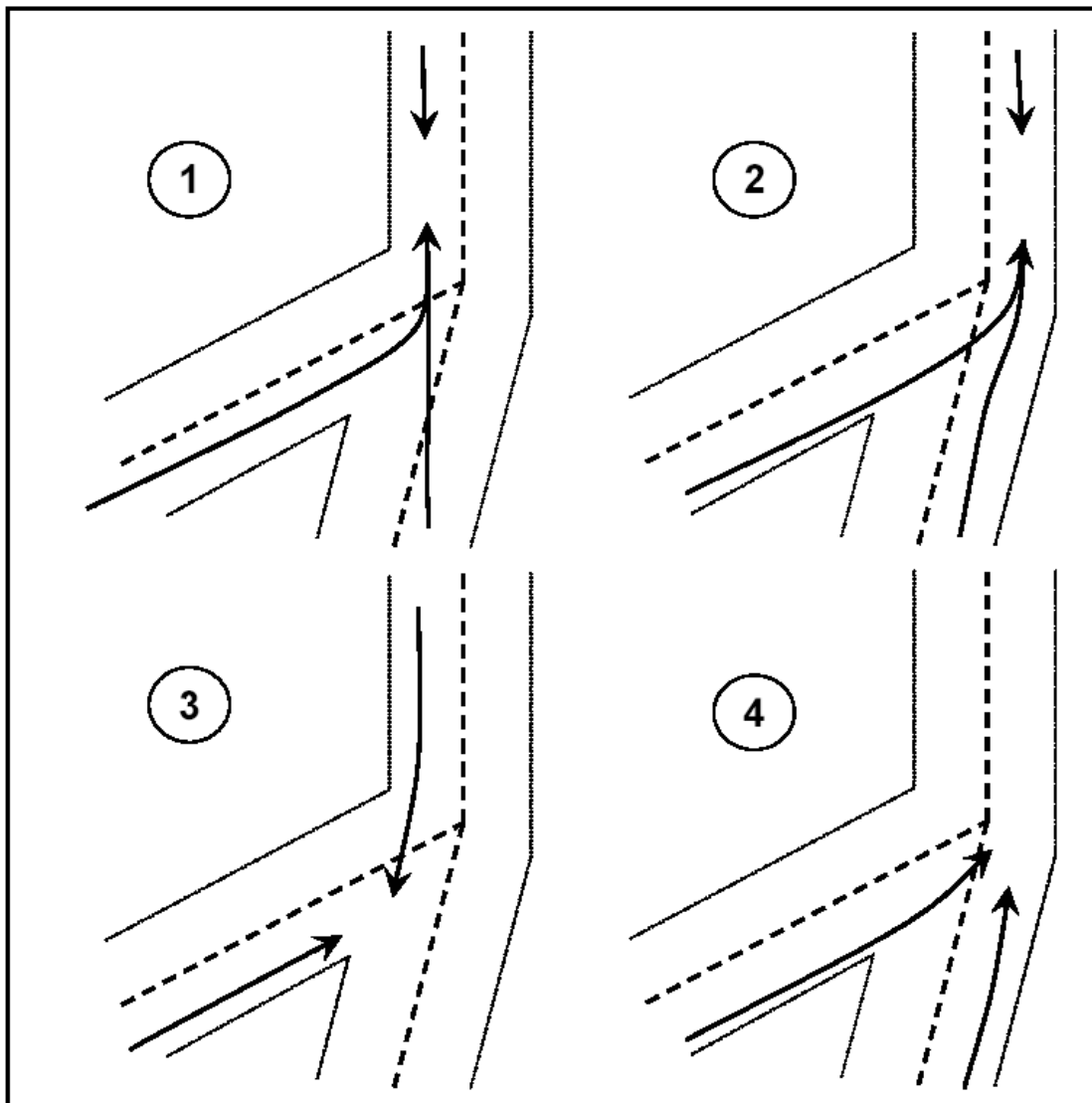
### ***The Agersoe Flak sea area***

The passage at Agersoe Flak is narrow. The distance between buoy 33 and the 20 meter-curve at Agersoe Flak is approximately 0.4 nautical miles.

Route-T has a sharp bend of approximately 50° at Agersoe Flak. Large ships, like BERGITTA, approaching from the deep-water route at Langeland have to make a big turn when entering the narrow passage.

Route-H meets route-T at Agersoe Flak. Ships, like MSC EYRA, that are not allowed to use the deep-water route therefore have to cross route T at Agersoe Flak in order to enter route-H.

### ***Collision scenarios.***



Sketch from Risk Analysis report for the "Agersoe Flak" area (see reference in chapter 3.8)

**Weather conditions**

There was restricted visibility when the collision occurred.

The ships could not observe each other visually before the distance between them was 0.5-0.8 nautical miles. At that time, both ships were in a starboard turn.

Southward current - 1-2 knots.

**Safe speed**

Prior to the collision on the southerly course MSC EYRA's speed was 18-18.5 knots (SOG). Thus the speed through the water was 1-2 knots less due to the current.

BERGITTA's speed was 12-13 knots (SOG).

The ships' relative speed was approximately 30 knots.

It is the opinion of the Division for Investigation of Maritime Accidents that MSC EYRA did not proceed at a safe speed appropriate to the prevailing circumstances and the condition with restricted visibility.

It is the opinion of the Division for Investigation of Maritime Accidents that BERGITTA due to the restricted visibility and the prevailing circumstances should have reduced its speed considering that the manoeuvrability was maintained.

**Look-out**

None of the ships had a designated look-out on the bridge. There should have been a person designated as look-out on both ships.

**Communication and manoeuvres**

It was initially MSC EYRA's intention to pass ahead of BERGITTA.

During the communication between the ships, initiated by the pilot, a port-to-port passage was agreed.

This caused that MSC EYRA had to readjust to a new and different situation in the last few minutes from the communication between the ships was initiated and until MSC EYRA should have made a turn at buoy # 33,

The ships did not communicate their precise intention with respect to course and speed.

The pilot expected MSC EYRA to turn at buoy # 33.

The pilot saw on the radar that MSC EYRA continued on a southerly course after having passed buoy # 33.

According to the radar recordings, BERGITTA was near the southernmost border of the DW-route.

The master on MSC EYRA assumed that BERGITTA also would turn to starboard in accordance with the agreement on the port-to-port passage.

The “port-to-port agreement” was made too late and under pressure. MSC EYRA did not have sufficient time to plan the course alteration. The decision on the port-to-port turn was hasty. This left little time to calculate or to predict the consequences of the following manoeuvres.

After having passed buoy # 33, due to high speed, the southward current and the late turn, MSC EYRA came too far southward before its course (COG) began to alter to starboard. MSC EYRA’s course (COG) did not alter until after MSC EYRA had passed the buoy.

The Division for Investigation of Maritime Accidents ascertains that MSC EYRA began its turn too late.

## **5 Conclusion**

It was predictable that the ships would get into a close ship situation. The crossing situation was not performed in a safe manner. This is supported by the following facts:

- The narrow passage
- The size of the ships
- BERGITTA’s limited manoeuvrability
- The ships’ speed
- The condition with restricted visibility
- The state of current

The contributing cause to the collision were that:

- The agreement on the port-to-port passage was made too late and under pressure
- The agreement did not include sufficient information on the intentions with respect the ships’ course and speed
- MSC EYRA’s starboard turn was not performed efficiently and it was made too late
- The current’s setting increased MSC EYRA’s turning circle
- Both of the ships misinterpreted the situation approximately 3 minutes before the collision and thereby the agreement on the port-to-port passage was not corrected

## 6 Recommendation

Since July 2004, one collision, two groundings and a near miss collision have occurred in connection with two or three ships had to pass Agersoe Flak at the same time.

July 2004: A bulk carrier with a draft of approximately 10.50 meters which was approaching northward bound in route-T met a small tank vessel which was approaching Agersoe Flak from the north. The tank vessel should continue via route H, and it passed – as it should – astern of the bulk carrier. However, the situation had the effect that the bulk carrier turned too late and it grounded at Agersoe Flak lighthouse. The grounding occurred in the night in moderate visibility.

October 2004: BERGITTA and MSC EYRA collided at Agersoe Flak (See figure on page 27 - collision scenario # 3).

May 2005: A tank ship with dead weight tonnage of 103622 t., a draft of 14.6 meters, with a pilot on board, which was northward bound in route-t met a reefer ship with a dead weight tonnage of 9970 t that was southward bound at Agersoe Flak. The reefer ship that was crossing route T in order to continue in route H, passed ahead of the tanker in a close range. It was daylight and the weather was clear (See figure on page 27 - collision scenario # 3).

June 2005: A bulk carrier without a pilot on board with a draft of 12.8 meters, approaching Agersoe Flak, northward bound in route-T, met a tanker with a dead weight of 34761 t which was approaching northward bound in route-H (See figure on page 27 - collision scenario 1). At the same time, a tanker with a dead weight tonnage of 115000 t was approaching from the north. The master on the bulk carrier chose to deviate from route-T and consequently, the ship grounded. The grounding occurred at approximately 0400 hours in the morning in clear weather.

According to "Risk Analysis of Navigational Safety in Danish Waters – Agersoe Flak update – mentioned in chapter 3.8, VTS Great Belt has registered 10 near miss collision in the period 1997-2002. However, it has to be noted that it is difficult to determine when an incident is to be regarded as a near miss situation.

The Division for Investigation of Maritime Accident is of the opinion that ships navigating in route-T and route-H should avoid meeting other ships with limited manoeuvrability at Agersoe Flak where route-T has a sharp bend.

The Division for Investigation of Maritime Accidents recommends that the Admiral Danish Fleet as the VTS authority takes the initiative, in cooperation with the Danish Maritime Authority, to examine the possibilities to perform navigational assistance services to ships navigating within the VTS area in order for ships to, in due time, avoid meeting other ships in junction points within the VTS area.