

CASUALTY REPORT

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File 01.40.01

Division for
Investigation
of Maritime Accidents
/NM

Collision between Danish m/v UNO and German pushbarge DETTMER TANK 116 on 11 July 2002

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MINISTRY OF ECONOMIC AND
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*The German Federal Bureau
of Maritime Casualty Investigation
has declared its fully approval of this Report*

1. The Casualty

<i>Type of casualty:</i>	Collision
<i>Location of casualty:</i>	The Kiel Canal at 21.5 km – Dückerwisch
<i>Date and time:</i>	11 July 2002 at 13.30 LT
<i>Injuries:</i>	The Chief Engineer was found drowned inside the vessel

2. Summary

UNO was on a voyage from Hagshamn, Sweden, to Hamburg with a cargo of 2237 tons of scrap. On its way westward through the Kiel Canal with a pilot on board and reaching the lay-by Dückerwisch on 11 July at about 13.30 the rudder suddenly went to port and could not be corrected.

At that time the chief officer steered the vessel by using the remote control box. When the rudder failed to react the chief officer pressed the button on the steering console but also without any immediate reaction of the rudder. The chief officer did not use the wheel.

UNO went across the middle of the channel and crossed ahead of the east going push unit, push boat DETTMER TANK (DT) 46 and push barge DETTMER TANK 116. A collision was unavoidable and UNO was hit on its starboard side by the stem of DT 116 at an angle of about 90°. UNO got a big hole in the starboard side and started immediately after the collision to heel to starboard. Although the master succeeded in grounding the stem of UNO on the southern bank of the channel the vessel capsized fast and ended up with only the port bow over the water.

The crew members and the pilot jumped over board and was rescued or swam ashore. The chief engineer was, however, missing. Although a thoroughly search was carried out by small boats and by divers outside and inside the vessel the chief engineer was not found.

After removal of the cargo and some temporary repair UNO was lifted by two cranes on 29 July and was towed to Brunsbüttel. The chief engineer was then found drowned in a cabin inside UNO.

DT 116 got a minor damage in the stem and could continue its voyage at the same day.

The steering gear of UNO has been very thoroughly tested but the tests have not disclosed any failures, which could have caused the unintended port turn.

3. Ship Particulars

<i>Name of ship:</i>	UNO	DETTMER TANK 116/ DETTMER TANK 46
<i>Registration No:</i>		5113480 / 4013070
<i>Home Port:</i>	Fredericia	Berlin / Berlin
<i>Control No:</i>	D 3481	
<i>Call sign:</i>	OWKY6	
<i>IMO No:</i>	7103186	
<i>Type of ship:</i>	Dry cargo ship	Pushbarge / Pushboat
<i>Construction year:</i>	1981	1992 / 1993
<i>Tonnage:</i>	1937 GT	1485 t / 955 t
<i>Length/breadth/draft</i>	77,2 m / 12,8 m / 8,0 m	79,2 m / 9,0 m / 2,4 m 67,0 m / 9,0 m / 2,4 m
<i>Engine Power:</i>	1213 kW	
<i>Crew:</i>	7	
<i>Passengers:</i>	1	
<i>Operator:</i>	C.J. Helt & Co., Svendborg	
<i>Classification Society:</i>	Germanischer Lloyd	Germanischer Lloyd

UNO was a single fixed propeller boxhold vessel with the bridge building located aft. The bridge was equipped with a gyrocompass and two FURUNO radar sets. There were two VHF sets, two GPS. The maximum speed of the vessel was 9,5 knots. In the middle of the bridge was a steering console with a seldom used wooden wheel for mechanical hydraulic steering. On top of the steering console there was two push buttons, which transmitted the steering orders electronically to the hydraulic steering gear in the steering gear room. In addition the vessel could also be steered by a remote control box connected to the push button system by cables. The steering gear was a Frydenbö Hydraulic steering gear.

4. Narratives

The Division for Investigation of Maritime Accidents met with the crew of UNO in Brunsbüttel on 12 July to interview the crew on the circumstances leading to the collision. At the same day the crew members had given statements to a lawyer appointed by the owner and the underwriters of UNO. On advise from the lawyer the crew members took the standpoint not at this stage to give further statements to the Investigation Division. Several telephone calls to the owner and the underwriters did not change this.

The following sequence of events is based upon the above mentioned statements of the crew of UNO and on statements given to the Wasserschutzpolizei, Brunsbüttel, by the pilot of UNO, the crew and the pilot of DT 46, the crew and the pilot of EKFORs and the crew and the pilot of NORCHEM.

UNO

The vessel was since 1991 owned by the master and the chief officer, his brother. The master and the chief officer shared the bridge watch, the master from 06.00 to 12.00 and from 18.00 to 24.00.

UNO left Hagshamn, Sweden, on 8 July at about 19.00 on a voyage to Hamburg loaded with 2.237 tons of scrap.

After an uneventful voyage the vessel arrived at the lock of Holtenau – the eastern entrance to the Kiel Canal – on 11 July at around 07.30. At Holtenau a pilot embarked and also a new chief engineer, who should relieve the present chief engineer after arrival at Hamburg. The vessel left Holtenau at around 08.00. The vessel was at even keel, draft 5.55 m.

In accordance with the normal schedule the master was on the bridge together with the pilot. The master steered the vessel by the remote control box connected to the push button system at the steering console. The weather was fine with a WSW wind, 4 beaufort, and good visibility. At 10.50 a pilot change took place at the pilot station Rusterbergen. The new pilot had previously served as pilot on board UNO.

At 11.55 the chief officer came on the bridge to take over as the officer of watch. After having passed an oncoming ship the master handed over the steering to the chief officer and went to the mess room to take lunch. At that moment there was not very much traffic in the Canal and the pilot advised the chief officer to keep the vessel in the middle of the Canal. UNO was the second ship in a convoy of three ships. In front of UNO was NORCHEM and following UNO was EKFORs. The chief officer also steered by the remote control box, and he had no problem in steering the vessel and he watched the rudder indicator constantly.

At the lay-by Fischerhütte, at around 12.30, the vessel had to stop to allow a large oncoming vessel to pass by. Around that moment the master went back to bridge for a short while before going to his cabin to watch TV. After the stop UNO continued in the Canal. The pilot took over the steering for about 20 minutes for no particular reason. The vessel proceeded at canal speed, 15 km/h.

After the 20 minutes the chief officer took over the steering again. He continued to steer the vessel by using the remote control box. Around 13.25 UNO was approaching the lay-by Dückerswisch. The ship was at that time proceeding at canal speed, 15 km/h, and on canal course, 189°, in the northern part of the Canal and was passed by two oncoming vessels. A third oncoming vessel, which later turned out to be the push unit DETTMER TANK, was approaching in the southern part of the Canal. 2 to 3 minutes later the chief officer suddenly realized that UNO was turning to port. The chief officer noticed that the rudder indicator was showing 20° to port, although he had not pressed the steering button accordingly. The chief officer immediately pressed the button to alter course to starboard, and when there was no reaction on the rudder indicator he pressed the push button at the steering console. The rudder, however, did not react and only after an extraordinary long period of time the rudder indicator showed that the rudder was moving back to starboard. UNO, however, continued to go to port. The distance to the oncoming vessel had then come down to 150 to 200 m.

The pilot also immediately noticed that UNO was turning to port. He ordered hard to starboard and he rushed to the manoeuvring lever and set it at stop and thereafter full astern. He noticed that the rudder indicator was showing 10° to port. Via VHF, channel 73, the pilot informed the pilot on board DT 46 about the steering problems.

The master in his cabin had noticed that the vessel turned and by looking out of the windows realized that the vessel turned to port and was far off its course. He immediately went to the bridge, where he noticed that the vessel was crossing the Canal towards the southern bank and that the engine was running full astern. He also saw an oncoming ship at a distance of 50 – 70 m bow to bow. Shortly after, at 13.31, the collision took place at Canal km 21.5 in the southern half of the Canal. UNO was hit on its starboard side, and the collision angle was about 90°. At the moment of the collision UNO was still moving forward. Shortly after the collision the two ships were free of each other.

The master sent the chief officer down to look at the damage and to get everybody on deck. He also sounded the general alarm signal. The chief officer reported back that there were ingress of water into the hold and that everybody were on deck.

Together with the pilot the master decided to try to ground the vessel on the southern bank. The engine was shifted to full ahead and the pilot steered the vessel. The bow of the vessel was banked at the southern bank but the rest of the vessel remained in free water. To keep the vessel at the bank the engine was kept at full ahead and the rudder hard to port. Shortly after the engine power was reduced and finally set at stop. Due to ingress of water UNO started listing to starboard and the list increased continuously until the water reached the hatch covers and the accommodation. In a short time UNO sank to the bottom with only the port bow over the surface.

The master and the pilot managed to get out of the wheel house and out into the water. When they were laying in the water the master checked for the other crew members and he saw them all except the chief engineer. He was lifted up in the dinghy of DETTMER TANK and brought ashore where he informed everybody that the chief engineer was missing.

The other crew members took on their lifejackets and jumped in the water. One was taken on board a sailing boat the other managed to swim ashore, a distance of 20 to 25 m.

Some of the crew members on the deck had after the collision seen the chief engineer sitting on a bollard. One of them asked him why he was not wearing his emergency suit and the chief engineer had answered back, that he could swim and that he would stay where he was.

During the hours following the collision the chief engineer was searched for by divers and also by dragging, however, with no result.

DETTMER TANK

The push unit DT 46 / DT 116 was proceeding eastward in the Kiel Canal. A pilot was embarked at Brunsbüttel at 11.45. The unit was proceeding at 13,8 km/h in the southern part of the Canal, the mate at the wheel. The weather was fine and clear. The Hochdonn Bridge was passed at 13.15. Due to information about oncoming vessels entering the lay-by Dückerwisch the speed was reduced to about 5 km/h.

3 oncoming vessels, NORCHEM, UNO and EKFOR, were at that time proceeding though the lay-by at channel speed. NORCHEM was passed at a distance of about 30 m. When the stem of DT 116 was passing the eastern most dolphin in the lay-by the pilot asked for full speed ahead.

At this moment, when the mate was operating the engine telegraph, the number two vessel, UNO, then at a distance of about 40 – 60 m, was suddenly seen turning more than 45° to port crossing ahead of the push unit. The engine was stopped and then set to full astern. A collision was however unavoidable and the starboard bow of DT 116 hit the starboard side of UNO. The collision was quite violent and caused one of the connections between the push boat and the barge to break. The push unit and UNO came free of each other shortly after the collision.

UNO started sinking and the dinghy of DT 46 was lowered and picked up two crew members of UNO. DT 116 got a minor damage in the forepeak tank. The push unit continued its voyage at 18.30.

At the time of the collision the master of DT 46 just entered the bridge. The rest of the crew was working on deck.

A sketch drawn up by the mate of DT 46 is attached as **Enclosure 1**.

EKFORS

The 5526 GT tanker EKFOR, Isle of Man, was transiting westward in the Kiel Canal. At the time of the collision EKFOR was proceeding at channel speed approximately 1000 m behind UNO. The master, the 2nd mate and a pilot were on the bridge. EKFOR was steered by a channel helmsman.

During the passage of the lay-by Dückerwisch they noticed that UNO suddenly turned to port and immediately after collided with an east going push unit. EKFOR passed the collision area at dead slow ahead keeping close to the north side of the channel.

NORCHEM

NORCHEM, Liberia flagged, was transiting in the Kiel Canal in front of UNO. At the time when the ship passed the lay-by Dückerwisch the mate, a pilot and a helmsman were on the bridge. The speed was reduced.

Just after passing the bridge Hochdonn they watched something happen to UNO and they saw the vessel grounded on the south bank heavily listing to starboard. Shortly after UNO sank, and people were seen swimming in the water.

As NORCHEM got no request for assistance the voyage was continued.

5. Further investigations

Diving operations

On 14 and 15 July diving operations carried out. The divers searched the inside of UNO without finding the missing chief engineer.

An inspection of the rudder and the propeller did not disclose any damage. The rudder was in the position 20° to starboard. The rudder indicator at the steering stand showed 20° to port. The rudder indicator under deck could not be read and the rudder indicator at the remote control box showed 5 ° to port. The engine telegraph was in stop position.

On the autopilot the course request needle was starboard on approx. 230° and the course needle on 130°.

The remote control box was found besides the steering console with the cable partly unrolled.

The salvage of UNO

The floating cranes ENAK and ROLAND started to lift UNO on 26 July after most of the cargo had been discharged.

On 29 July, while UNO was hanging in the cranes, the missing chief engineer was searched in his cabin but without result.

On 30 July between 10.00 and 13.30 UNO was towed to Brunsbüttel. The hole in the starboard side had been patched by a bolted on steel plate.

At 14.10 the missing chief engineer was found in a cabin in port side of the vessel and was brought ashore by the authorities.



Test of the steering system of UNO

On 30 July in Brunsbüttel a functional test of UNO's steering system was carried out. The electrical equipment in the wheel house was checked, and no apparent defects nor fault settings were found.

The isolation of the cables for the remote control box was found to be partly damaged. The cables were dismantled and tested.

The hydraulic system and oil was found to be in good condition. The emergency steering, hydraulic pump on the steering wheel, worked and the rudder could be moved to port and starboard by this system.

On 21 August a very thorough examination of all components of the steering system was carried out.

Also this examination concluded, that no failure in the electrical system could be found. Neither was observed any malfunctions in the hydraulic or in the mechanical systems of the steering system although they had been under water during the time when UNO was laying at the bottom.

According to the Wasser- und Schifffahrtsamt Brunsbüttel there are no electrical cables at the bottom or in the air in the neighbourhood of the lay-by Dückerwisch, which could have caused an electromagnetic disturbance of the steering system.

6. Comments made by the Division for Investigation of Maritime Accidents

UNO was fully certificated. It was crewed in accordance with international regulations.

The voyage from Hagshamn until the collision must be described as quite normal and uneventful with equipment and machinery in function without any problems.

During the passage in the Kiel Canal UNO was steered by using the remote control box, and there were no indications of malfunction before the sudden turn to port.

According to the pilot of UNO the rudder was kept hard to port to keep the vessel at the bank shortly before the capsizing. According to the divers the rudder was seen in the position 20° to starboard and the rudder indicator 20° to port.

The rudder of UNO was a spade-rudder. With the ship laying on its starboard side and the aft part of the ship in free water the weight of the rudder will most likely force the rudder to a starboard position. This can explain the difference between the actual position of the rudder and the rudder indicator position.

Several tests and examinations of the steering system of UNO have been carried out. No apparent defects or fault settings, neither in the electrical system nor in the hydraulic oil system, have been found which could explain the unintended port turn. Also functional tests of the steering system have been carried out. During these tests the steering system functioned as normal although the vessel had been under water for more than two weeks.

UNO's chief officer did not use the hand wheel to correct the rudder angle.

The Investigation Division is of the opinion that an immediate actuation of the hand wheel could have achieved correction of the rudder angle and thus possible have avoided or reduced the impacts of the collision.

In DETTMER TANK the engine was stopped and then set to full astern when UNO's turn was observed.

The Investigation Division is of the opinion that DETTMER TANK in the situation did not have any other possibilities to try to avoid the collision.

7. Conclusions

The collision between UNO and DETTMER TANK happened because UNO made a sudden and unintended turn to port. At the time of the turn the vessel was steered by the remote control box.

Very thoroughly tests and examinations of the steering system of UNO have not disclosed any failure in the steering system. Although the isolation of the remote control box cable was found partly to be in a bad condition, which may have caused a momentous current leakage and thereby the unintended turn, this had not been confirmed by the tests and is to be considered as technically improbable.

Immediate actuation of the hand wheel could have achieved a correction of the rudder angle and thus possibly have avoided or reduced the impacts of the collision.

There is no evidence to indicate electromagnetic disturbance of the steering system from the surroundings.

UNO's chief engineer lost his life because he was trapped in a cabin inside the vessel when it sank. Shortly after the collision he was seen at the deck, and it has not been possible to disclose why and how he went from the deck to the cabin.

8. Enclosures

Enclosure 1: A sketch of the movements of the vessels drawn up by the mate of DETTMER TANK 46.

Niels Mogensen
Deputy Chief of Investigation

ENCLOSURE 1

