

Investigation Report 45/04

1. February 2006

very serious marine casualty:

Collision between CMV COSCO HAMBURG and CMV P&O NEDLLOYD FINLAND on 01 March 2004 on the Lower Elbe/off Buoy 91 with the Death of one Seaman

1 Summary of the marine casualty

On 1 March 2004 at about 14.40 h CET¹ the Container Vessel P&O NEDLLOYD FINLAND² under German flag proceeding upstream on the river Elbe, bound for Hamburg, collided on the lower Elbe with the large Container Vessel COSCO HAMBURG also bound for Hamburg and sailing under the flag of the Hong Kong Special Administrative Region. COSCO HAMBURG had beforehand almost completely overtaken NEDLLOYD FINLAND that was working in feeder service, under good weather and visibility and its stern was just passing the fore ship area of the feeder vessel, when the latter suddenly lost its steerability on the basis of hydrodynamic interactions (suction effect) and turned very quickly with its bow towards the aft ship of COSCO HAMBURG. There was violent contact between the two vessels, both under pilot advice, in the said area. As a consequence of the impact NEDLLOYD FINLAND temporarily developed a list of between 30 and 40°. This led to several partly already unlashed containers on board the vessel being ripped out of their anchorages. One container went over board. However, both vessels remained afloat and were able to continue their voyage under their own power with damage above the water line in each case.

A short time after the collision a Philippine able bodied seaman³ on board NEDLLOYD FINLAND was missed. At the time of the collision the seaman had been engaged in unlashng the containers on deck and must have lost his hold when NEDLLOYD FINLAND heeled over strongly as a result of the collision. The Captain issued a missing person notice at 14.53 h on VHF Channel 68. At the same time he initiated a person-over-board⁴ manoeuvre. In addition several vessels belonging to public authorities (Waterway Police and Waterways and Shipping Directorate⁵) nearby participated in the search. At 15.36 h the unconscious seaman was recovered by the Sounding Vessel NIEDERELBE⁶ between buoys 88 and 90 and subsequently brought ashore. The resuscitation attempts carried out were unsuccessful. At 16.02 h the rescue forces reported that the person had died.

The 40-foot container that went over board and was drifting towards Glückstadt with the ebb stream was secured by the vessels that had hurried to the scene of the accident and towed to Kollmar. As it did not contain any dangerous cargo and as no fuels or other oils and lubricants had spilled out during the collision of the vessels, the environment was not impaired by the marine casualty.

¹ CET=Local Time=UTC+1h; this suffix is not repeated in the following.

² Hereinafter referred to briefly as "NEDLLOYD FINLAND"

³ Able bodied seaman - this function designation is abbreviated in the following to "seaman"

⁴ Correct designation for the traditional formulation "Man over board".

⁵ Abbreviated to WSV

⁶ Sounding vessel in the service of the Waterways and Shipping Office (WSA) Hamburg

2 Safety Recommendations

2.1 Safety recommendations of 1 October 2004

In view of the special danger in delaying, the BSU has already issued a safety recommendation during the extensive ongoing investigations to prevent future accidents occurring for the same or similar reasons. This recommendation still stands in full after completion of the investigation and is therefore repeated again here:

"In accordance with § 9 Para. 2 No. 2; § 15 Para. 1 and 10 of the Maritime Safety Investigation Law (SUG) of 16 June 2002 in conjunction with § 19 Law Relating to the Investigation into Accidents and Incidents Associated with the Operation of Civil Aircraft (FIUUG) of 26 August 1998, the BSU issues the following safety recommendations:

The BSU is investigating the collision between a container vessel registered in Hong Kong and a German feeder vessel at Buoy 91 on the river Elbe on 1 March 2004 in the course of which a Philippine sailor lost his life. The investigation of the marine casualty has not yet been completed. According to the current status of investigations, however, it is to be assumed that the feeder vessel (length over all: 101 m) was caught in the wash suction during an overtaking manoeuvre by the container vessel (length over all: 280 m). The hydrodynamic suction effect was so strong that the bow of the feeder vessel touched the starboard aft part of the container vessel.

The accident occurrence prompts us to draw the attention of ship commands and pilots to the following:

Hydrodynamically conditioned suction effects that act during overtaking, especially when large vessels overtake smaller vessels, may not under any circumstances be underestimated. Passing distances during overtaking or encounters must always be dimensioned in such a way that no dangerous suction results. In this connection the Federal Bureau of Maritime Casualty Investigation (BSU) draws attention to the fact that it is no longer fundamentally possible to maintain the opinion held in the past by the German Seeämter (maritime casualty investigation authorities), the Bundesoberseeamt (higher maritime casualty investigation authority) and a few courts that no suction effect occurs any more at a passing distance of 100 m, or that at any rate such a suction effect can be mastered,.

Taking today's traffic situation as a basis (increasingly larger, faster vessels with a greater draft), it is to be assumed that dangerous suction effects cannot be ruled out even at passing distances of well over 150 m.

The BSU is currently checking whether concrete quantity recommendations can be issued in future for safe passing distances. However, it is to be considered that such recommendations will be dependent on many factors (size, draft, speed and manoeuvring properties of the vessels, water depth, navigation channel effects) and accordingly it appears very difficult to stipulate these generally, at any rate at present.

That is why in view of the lack of concrete standard values for passing distances during overtaking communication between the participating vessel commands and in particular support of the overtaking manoeuvre by the vessel to be overtaken are extremely important in avoiding suction effects. In this connection the BSU reminds participants of the statutory obligation in federal German waterways for the vessel to be overtaken to facilitate the overtaking process as far as possible (cf. § 23 Para. 2 SeeSchStrO). Under international aspects too there is a legally binding rule that the overtaken vessel must take measures for safe passage (cf. Rule 9 Letter e Collision Prevention Regulations).

That is why it should also be noted when selecting the appropriate measures in the spirit of the above remarks that

- **during encountering and overtaking between a large and a small vessel (e.g. length ratio 2:1) the large vessel does not sheer substantially from its course, while the small vessel is at risk of running out of the rudder,**
- **the forces that occur affecting a small vessel during the passing operation depend primarily on the speed of the larger vessel through the water and only slightly on the speed of the smaller vessel,**
- **the speed difference between the vessels is not crucial as regards the forces acting.**

All this leads to a need for the overtaken vessel to reduce speed prior to the start of an overtaking manoeuvre if the probable (or possible) passing distance is such that occurrence of suction forces cannot be ruled out safely. On the one hand this has the advantage that the effective duration of the suction forces building up between the vessel hulls can be minimised. Furthermore the vessel to be overtaken will thus be enabled to increase its steerability during a later phase of the passing operation by briefly increasing its rate of speed to counteract any suction effects occurring effectively.

However, it is to be stressed that the small vessel should definitely avoid reducing speed at a time at which a suction effect is already starting to make itself noticeable, since reducing speed basically has a negative influence on steerability. Furthermore, depending on the execution of the vessel screw(s) (fixed/variable pitch propeller, left-hand/right-hand) the direct and indirect steering effects, especially during reverse manoeuvres, can promote turning towards the potential other party in a collision.

The analysis of the marine casualty also revealed that a collision of the vessels could not be reconstructed with the GPS positions processed from the electronic sea chart systems in each case. Accordingly as regards the recording/processing of GPS signals there must have been a system and/or configuration-related error in at least one of the two ships. However, this was not the cause of the accident.

The BSU draws attention to the fact that it must be ensured that the vessel operators, the manufacturers of the relevant systems, the supervisory organs and the vessel commands can intervene and monitor in accordance with their relevant scope of tasks that the vessels are being operated internally with the correct parameters. This requirement gains additional weight when one takes into account the fact that in adverse circumstances false data may be disseminated via the automatic ship identification systems (AIS). This could lead to incorrect assessments of the traffic situation by the recipients of the data.

Finally, the BSU stresses that this safety recommendation may not under any circumstances be misunderstood as anticipating the results of the investigation into the accident of 1 March 2004. It is expressly not connected with an assessment of the collision happenings. On the contrary, the recommendation solely serves the legally allocated purpose of preventing future accidents caused by the same or similar reasons.

For an assessment of the accident reference is made to the complete investigation report which the BSU will publish on completion.⁷

⁷ The text printed in grey is no longer applicable.

2.2 Further recommendations

1. As a supplement to the reference contained in Recommendation 8.1 that the safe passing distance depends crucially on the speed of the overtaking vessel *through* the water, the attention of **vessel commands and pilots** of sea-going vessels is drawn to the fact that GPS-based speed information on board that map the speed *over ground* do not form any sufficient basis for determining a safe overtaking speed when considered in isolation. Instead the relevant data must be adjusted for the influences - that may be significant - of current and wind.
2. The attention of **vessel commands and pilots** of sea-going vessels is drawn to the fact that overtaking manoeuvres in (narrow) navigation channels that need the collaboration of the vessel being overtaken for safety reasons are only admissible if the vessel to be overtaken has previously clearly consented to the overtaking manoeuvre in response to a corresponding request by the overtaking vessel (cf. § 23 Para. 4 Sentence 1 Seeschiffahrtsstraßen-Ordnung (Traffic Regulation for Navigable Waterways) for the national area and Rule 9 Letter e Number (i) for the international area). Accordingly the **vessel command and pilots** of the vessel to be overtaken have the right and obligation to refuse the overtaking manoeuvre from case to case if they come to the conclusion that despite utilising all reasonable collaboration contributions safe implementation of the overtaking operation cannot be ensured beyond doubt.
3. The **vessel commands and pilots**, especially of large vessels (**to be defined in more detail by the relevant responsible Waterways and Shipping Office (WSA)**) are urgently recommended to report any intended overtaking manoeuvre to the responsible Vessel Traffic Services in good time. In addition to direct communication between the vessels involved (cf. No. 2 above), coordination with the Vessel Traffic Services regarding the traffic situation and the local and actual features is advisable for the intended manoeuvre. The coordination by the Vessel Traffic Services is indispensable above all in the interest of safety of other shipping too, when for instance one or both of the participating vessels are considering overstepping the given navigation channel briefly in order to achieve a safe passing distance.
4. The **Federal Ministries for Transport, Building and Urban Development (BMVBS)** and **for Economics and Technology (BMWi)** are called upon with regard to effective improvement of the safety and ease of shipping traffic to review the possibilities of awarding research funds in order to have currently lacking, reliable and as generally valid as possible recommendations on the problem complex of "**safe passing distance during approaches of vessels in restricted navigation channels**" elaborated by Ship Model Basins and other suitable scientific institutions (for example **shipping academies, research and development departments of manufacturers and operators of vessel command simulators**).

The objective of corresponding research orders must be to provide vessel commands and pilots on board with **practicable sets of instruments** for the relevant river estuaries, for example in the form of tables or computing programs in order to identify hydrodynamically conditioned dangers in connection with overtaking and encounter situations effectively and be able to take appropriate action in good time.

A first important step in this direction that would particularly cater to the requirements of practice and could probably be implemented already in the medium term would be to provide improved computing programs for existing vessel command simulators and new ones to be installed. Vessel commands and pilots could thus "experience" and train for hydrodynamically conditioned borderline situations better than so far.

The demand for research outlined here is of high macroeconomic importance due to the dangers threatening for humans and the environment regularly connected with shipping accidents. It is made particularly important by the fact that the risks of serious accidents

due to dangerous and no longer manageable approaches will increase significantly in future in view of the fact that vessel units are becoming ever larger.

5. The currently available vessel command simulators are partly in a position to map hydrodynamic effects at least to a certain degree. Despite their existing technical limits and independently of the demand for research outlined under No. 4, they thus already provide valuable opportunities for training in close encounter situations. The **supervisory authorities** responsible for **piloting** and **operators** of **sea-going vessels** are recommended to provide the pilots and vessel commands operating in their spheres of responsibility with sufficient training facilities on the simulation facilities available.
6. The attention of **owners and operators** as **commands** of sea-going vessels is drawn to the fact that any kind of lashing and unlashng work on board moving vessels that exceeds, for example, the measure indispensable due to weather conditions (known as post-lashing) infringes both the internationally binding legal regulations set out in SOLAS Chapter VI Rule 5 and the German Accident Prevention Regulations UVV See (§ 9; Pamphlet E 2) and Port Work (§§ 11, 43 in conjunction with § 3 Para. 1 UVV See). **Vessel commands** are accordingly called upon not to charge seamen on board *moving* vessels with such work.
7. The attention of **charterers** and **parties chartering out** feeder vessels is drawn to the fact that clauses in charter parties stating that vessels must arrive at the terminal with unlashng containers infringe mandatory national and international law (cf. No. 6) and are therefore invalid.
8. The **See-Berufsgenossenschaft** and **water police of the Laender (German states)** are called upon to foster observation of the legal regulations cited under No. 6 within their spheres of responsibility and their legal and actual potentials. In this connection it is recommended that the **See-Berufsgenossenschaft** add a note clarifying the prohibition of lashing/unlashng work on board moving vessels, to its Pamphlet E 2.