

Investigation Report No. 198/15

Date: 13 September 2018

Serious Marine casualty

Chemical reaction within the fertilizer load on board the PURPLE BEACH in the deep water roadstead on the German Bight on 25 May 2015

1 Summary

The PURPLE BEACH, flying the flag of the Republic of the Marshall Islands, was proceeding to Brake on 25 May 2015. Loads of various types of fertilizer were on board the multi-purpose carrier in the lower holds of cargo holds 2 to 5, which were loaded in Antwerp. In addition, various types of general cargo were stowed in cargo hold 1 and in the tween decks of cargo holds 3 and 4.

Since the River Weser was closed due to a separate incident, the ship's command opted for an anchorage in the deep water roadstead on the German Bight. During the anchor manoeuvre, the master noticed smoke in the area of cargo hold 3 from his position on the bridge. An initial survey of the scene was carried out during the anchor manoeuvre. Some time later, an individual wearing breathing apparatus attempted to investigate cargo hold 3. This attempt was aborted due to the dense smoke rising from the cargo hold entrance hatch (booby hatch). The ship's command had realised, that the smoke generation was possibly connected with the cargo of fertilizer in the lower hold of cargo hold 3.

After consultation with the ship's management, the ship's command decided to use CO₂ as an extinguishing agent. The Weser pilots were notified of the events on board as the first contact point ashore 2.5 hours after the CO₂ was discharged. Later on, Vessel Traffic Service (VTS) Bremerhaven issued a prohibition on entry, which was to be maintained until the situation on board was clarified. Since a fact-finding team (FFT) from the fire service was required for the inspection on board, VTS Wilhelmshaven contacted the German Central Command for Maritime Emergencies (CCME) with a request that it assume overall command of the operation, which happened at 0259 on 26 May 2015¹. The first team from Cuxhaven Fire Service reached the PURPLE BEACH on a federal police helicopter at about 0500. The firefighters established that the ammonium nitrate-containing fertilizer on board decomposed. With regard to an assessment about the development of the reaction rate, the fire department could only make an approximation. Therefore, the vessel was not considered a safe platform anymore. This led to the decision to evacuate the vessel. When the firefighters left the vessel a massive outbreak of smoke developed, which – together with the readings made – was indicative of an imminent explosion. All the firefighters left the ship as the situation unfolded. The ship's command of the PURPLE BEACH was advised to abandon the ship as well. The crew complied with this and abandoned the ship on a free-fall lifeboat. The nearby MELLUM took the crew of the PURPLE BEACH on board. Due to the exposure of the crew of the PURPLE BEACH, the firefighters, and some of the MELLUM's crew members, these individuals were all decontaminated, examined, and later flown to various hospitals as a precaution.

¹ All times shown in this report are Central European Summer Time (CEST) = UTC + 2 hours.

The ships MELLUM, NEUWERK und NORDIC were ordered to the scene and were later tasked with cooling the distressed vessel and suppressing the cloud of smoke. The assumption at this point was that an exothermal self-sustaining decomposition of ammonium nitrate based fertilizer had occurred in hold 3 and was ongoing. The deployed units managed to flood cargo hold 3 of the ship with water over the next few days, thus stopping the reaction. The ship was then towed to a place of refuge in Wilhelmshaven, which is also where the BSU began its investigations on board the ship.

For the actual unloading operations and the disposal of discharged water, the PURPLE BEACH later shifted to another berth in Wilhelmshaven, where the unloading of the ship was completed in July 2016. The towing operation to Turkey, where the ship was destined for scrapping, began in March 2017.

The marine casualty did not give rise to any fatalities or serious injuries. The BSU was not made aware of any water pollution.

2 Safety Recommendations

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

2.1 Management: Vineta Bereederungsgesellschaft

The Federal Bureau of Maritime Casualty Investigation recommends that the ship's management alter its ISM system with regard to sensitive cargo to avoid future violations of the requirements of the IMSBC Code for stowing over hatch covers that should be kept accessible, for welding in the vicinity of substances listed therein and for the acceptance of fuel while certain cargoes are being loaded or unloaded.

2.2 Management: Vineta Bereederungsgesellschaft

The Federal Bureau of Maritime Casualty Investigation recommends that the ship's management inspect the cargo hold lights installed on its ships, so as to ensure they comply with the specifications set out in the Annex to the List of Equipment of the Document of Compliance for the Carriage of Solid Bulk Cargoes.

2.3 Federal Ministry of Transport and Digital Infrastructure (BMVI)

The Federal Bureau of Maritime Casualty Investigation recommends that the BMVI urge the appropriate committees of the International Maritime Organization (IMO) to classify ammonium nitrate based fertilizers (non-hazardous) under Group B, so as to highlight the hazards associated with them more clearly.

2.4 Federal Ministry of Transport and Digital Infrastructure (BMVI)

The Federal Bureau of Maritime Casualty Investigation recommends that the BMVI urge the appropriate committees of the International Maritime Organization (IMO) to ensure that in addition to the manufacturer's product description, ammonium nitrate based fertilizers also be clearly described with regard to dangerous components, such as chloride and phosphate, to provide for better identification.

2.5 Federal Ministry of Transport and Digital Infrastructure (BMVI)

The Federal Bureau of Maritime Casualty Investigation recommends that the BMVI urge the appropriate committees of the International Maritime Organization (IMO) to ensure that the result of a current trough test (as per UN Manual of Tests and Criteria, part III, subsection 38.2) be provided to masters or their representative before loading.

2.6 Federal Ministry of Transport and Digital Infrastructure (BMVI)

The Federal Bureau of Maritime Casualty Investigation recommends that the BMVI urge the appropriate committees of the International Maritime Organization (IMO) to ensure that the solid bulk cargo definition suffix 'non-hazardous' be deleted because it fails to account for the hazards actually posed during loading and carriage sufficiently.

2.7 Federal Ministry of Transport and Digital Infrastructure (BMVI)

The Federal Bureau of Maritime Casualty Investigation recommends that the BMVI urge the appropriate committees of the International Maritime Organization (IMO) to ensure that unpowered tween deck hatch covers always be open to ensure maximum ventilation and heat dissipation even under adverse conditions.

2.8 Federal Ministry of Transport and Digital Infrastructure (BMVI)

The Federal Bureau of Maritime Casualty Investigation recommends that the BMVI ensure the CCME has the necessary to fill the role of OSC in every operation and the role of assistant commander in particular operations.

2.9 Fertilizer manufacturer

The Federal Bureau of Maritime Casualty Investigation recommends that EuroChem Agro GmbH carry out a trough test as part of its quality assurance before each ammonium nitrate based fertilizer (non-hazardous) shipment.