

1989, July 18

German Bight

Epichlorohydrin (Class 6) in drums; poisonous liquid that emits toxic vapours; VP 2 kPa (20°C), TLV 5 ppm (USA); potential human carcinogen

Summary: The Dutch cargo ship **Oostzee** ran into a storm en route from Rotterdam to Leningrad. 975 tons of **epichlorohydrin** in 3900 drums (250 kg per drum) was stowed in upright position, without proper lashings, on the smooth-surfaced tween deck. Filled drums, stowed around empty drums, shifted in the storm and squeezed the empty ones, thus resulting in greater shift and damage. Leaking drums gave rise to **dangerous atmosphere** that caused inhalation **poisoning** among the crew. Oostzee was instructed by the German Shipping Administration to anchor at a place close to Cuxhaven. All 14 crew were hospitalised for 10 days. The cargo holds were found to contain highly toxic atmosphere and a great number of damaged and leaking drums mixed with general cargo. As a first step, part of the spilled epichlorohydrin was pumped up and transported to a disposal site. The ship was taken to a better equipped port in the River Elbe but was soon moved to a less populated port in the Elbe Estuary. Special care was first taken to reduce the **risk of explosion**. But later it was realised that the gas concentrations were far below the flammable limit (but yet highly toxic). The engine rooms and the cargo holds were ventilated with the object to reduce the concentration of epichlorohydrin vapours to 3 ppm. During this work a wide **safety zone** was established around the vessel (diameter 1000 m) as well as in the airspace above (height 2000 ft). Damaged drums were transferred to **overpacks** and transported to a chemical company for disposal. Also the general cargo was finally unloaded. 263 damaged drums and 2200 l of epichlorohydrin had been taken care of for disposal. 8100 l of epichlorohydrin had evaporated into the air during the operation.

Cause of accident: See above. Shifting of cargo in adverse weather owing to improper stowage.

Comments on response: In the beginning of the operation it was difficult to assess the hazard from the cargo and Oostzee had for safety reasons to be moved several times during the response operation. There were no tugboats available that had safety equipment for toxic gases. The epichlorohydrin vapours were found to be more dangerous than expected and 30 persons from the response organisation and mass media had to be medically examined. One person was irreversibly injured. In view of these incidents, the awareness and cautiousness regarding the toxic and carcinogenic properties of epichlorohydrin might be questioned.

Source of information: "The OOSTZEE Case July/August 1989", Waterways and Shipping Directorate North, Special Federal Unit for Marine Pollution Control, Deichstrasse 12, D-2190 Cuxhaven, Germany.
(Abstracted 1991-04-18 by Björn Looström, Swedish Coast Guard H.Q.)