

Sindbad

Maritime Chemical Accident

1979, December 10

North Sea, 20 n.m. west of IJmuiden, Holland

Chlorine (Class 2) in steel cylinders; corrosive and highly toxic gas
TLV 0.5 ppm (USA), IDLH 30 ppm (USA); **marine pollutant**

Summary: In adverse weather, the Iraqi ship **Sindbad** lost her deck cargo on her way from Hamburg to Rotterdam at a depth of 25-30 metres. Among the cargo, there were 51 steel cylinders (size 0.9x2 m), each filled with 1000 kg liquefied **chlorine** (Bp. 34°C) that gives pressure of 340 kPa at a bottom water temperature of 5°C. A search started in two 1x18 km areas by two ships equipped with **side-scan sonars**. In January 1980, 5 cylinders were located. They were attached to steel lines by divers, and recovered. After these finds, the state-organised search had to be suspended, but a premium was offered to fishermen for each cylinder brought ashore. During the following four years, 7 cylinders were found and **trawled by fishermen**. The last cylinders found in this period were very corroded and thereby showed that the cylinders constituted a great hazard to fishermen and other seafarers. The Dutch authorities elaborated a special response strategy for the situation. In 1984 a new extensive search started with side-scan sonars. Registered bottom echoes were closer inspected by a **remotely operated vehicle** (ROV) Duplus II. Some of the found cylinders were moored to a safer place on the seafloor. Divers then placed 6 kg of the explosive Donarit S under each cylinder, which then was blasted under control. The chlorine content of each cylinder raised to the surface and developed, in one hour, a cloud 300 m wide, 3000 m long and 300 m high. It was made better visible by **releasing ammonia** from a ship upwind. The reaction between ammonia and chlorine formed a clearly visible white cloud of ammonium chloride. No ecological damage was detected from chlorine. Single seabirds were occasionally observed flying into the gas cloud and falling immediately like stones to the water surface. The total cost for the Dutch authorities was around \$ 1 million.

Cause of Accident: Lost deck cargo in adverse weather.

Comments on Response: It was a long delay, of almost 5 years until 1984, before the final response operation started. The reason for this is unclear and might be questioned. The strategy with controlled blasting of the cylinders was elaborated after careful studies of different alternatives. It proved to be a successful method as performed in this operation with careful supervision of the spreading of the gas clouds. It was an ingenious method to highlight the chlorine cloud with ammonia.

Source of Information: Proceedings of the 1986 Hazardous Material Spills Conference, p. 25-36, and personal communication.
(Abstracted April 1991 by Björn Looström, Swedish Coast Guard H.Q.)