

1992, January 4

30 n.m. off the coast of Cape May, New Jersey, USA

Arsenic trioxide (Class 6) in drums; a biocide which is very poisonous by ingestion and possibly by skin absorption, a known carcinogen

Magnesium phosphide (Class 4) in drums. The substance is a toxic biocide and is used as a fumigant to control insects. It is acutely toxic when ingested and reacts with water or atmospheric moisture to emit **phosphine**, TLV 0.3 ppm (USA), IDLH 200 ppm (USA). The latter is a highly toxic and reactive gas. Phosphine is also extremely flammable and is often contaminated by small amounts of **diphosphane** that is likely to autoignite in air and cause explosion, even at ambient temperature.

Summary: In adverse weather the Panamanian container ship **Santa Clara I** lost 21 intermodal containers overboard some 30 nautical miles off the coast of Cape May, New Jersey. Four of these containers were loaded with arsenic trioxide. In addition, two damaged containers holding this highly toxic chemical remained on the vessel. A total sum of 414 drums each of 374 pounds arsenic trioxide were lost overboard in 125 feet of water. The search of the drums took place with participation of vessels and aircraft from the U.S. Coast guard, assisted by Navy helicopters. Some of the vessels were equipped with side-scan sonars and sophisticated navigational equipment. A special constructed salvage barge with two large ROV:s (Remotely Operated Vehicles) was used by the salvage team who managed to salvage 320 of the 414 drums of arsenic trioxide from the ocean floor. When **Santa Clara** arrived in the port of Baltimore on the day after the accident, a 40-foot container, with drums of arsenic trioxide, was dangling precariously off the port side of the vessel. In addition, a large number of blue 55-gallon drums with arsenic trioxide were strewn about the deck. It took little more than one day to clean up the arsenic trioxide from the deck. Information provided by the **Santa Clara** dangerous cargo manifest indicated that the arsenic trioxide was the only hazardous cargo on board and the vessel could depart Baltimore. In the next port (Charleston), a grey powder was found covering the floor of the number one hold. More than 400 kilograms of **magnesium phosphide** was spilled in the hold. The hold was closed and sealed to keep out any moisture. The ship was evacuated except for an emergency team of 10 crew members and was taken to a more isolated anchorage where she was decontaminated by personnel of the National Strike Force.

Cause of Accident: Improper securing of cargo in combination with foolish sailing in extremely rough weather conditions with winds of over 50 knots and seas up to 28 feet.

Comments on Response: There are several aspects of this incident which makes it unique. The first concerned the extremely hazardous nature of the cargo carried on board Santa Clara. A single dose of arsenic trioxide no larger than the size of an aspirin tablet is lethal to humans. The main deck and several cargo hatches of the vessel were literally awash with the substance when it arrived at the pier in Baltimore. Below deck in the 1 cargo hold, toxic magnesium phosphide had spilled, when exposed to water, produces phosphine gas, which is extremely toxic, flammable and explosive. These conditions made it very difficult to clean-up and decontaminate the vessel. For instance, the decontamination team had to wait to the right weather forecast before they could open the cargo hold. A second concern was the casual manner in which these hazardous cargoes were treated. The vessel's owner and crew failed to record the drums of magnesium phosphide on the cargo manifest. A crewman scooped up some of the spilled powder in

his hands, smelled it, and though he felt sick, never reported it to the ship's medical officer. The crew freely wandered about the deck contaminated with arsenic trioxide, despite the fact that they were warned of the danger. The final and, perhaps the most serious aspect of the Santa Clara incident, was an unwillingness by the owner of the vessel to step forward and call attention to the gravity of the problem. In Baltimore, a cargo surveyor hired by the ship's owner examined the condition of the cargo. He witnessed extensive cargo damage and spillage below decks, but no report was filed to the Coast Guard. Therefore, the vessel could leave Baltimore in an extremely hazardous condition, placing its crew and ultimately put the port of Charleston and its citizens at great risk. The Coast Guard recommended criminal action against Santa Clara's owner.

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(Abstracted July 1993 by Björn Looström, Swedish Coast Guard H.Q.)