



**UNITED STATES COAST GUARD**  
U.S. Department of Homeland Security

**MARINE SAFETY ALERT**

**Inspections and Compliance Directorate**

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Washington, DC

Safety Alert 09-16

**Know Your Day-to-Day Dangers!  
Proper Precautions Can Save Your Life**

This safety alert reiterates the importance of following proper safety procedures and using the right protective equipment such as personal multi-gas detectors. Recently, a Coast Guard team boarded a commercial shrimp vessel in the Gulf of Mexico and was exposed to an extremely hazardous atmosphere containing hydrogen sulfide gas (H<sub>2</sub>S). The team's monitoring equipment functioned properly alerting them of an unsafe atmosphere of H<sub>2</sub>S in the fish hold. An elevated level of H<sub>2</sub>S was also detected in the engine room. Both spaces were evacuated.

The vessel's voyage was terminated and the vessel was escorted to the dock. The crew was instructed not to enter the spaces until a marine chemist determined the spaces were safe to enter. The spaces were ventilated overnight and a chemist checked them the following morning. The source of the H<sub>2</sub>S was attributed to decomposing shrimp. The chemist also identified another concern related to the improper use of sodium metabisulfite (NA<sub>2</sub>S<sub>2</sub>O<sub>5</sub>), a common preservative used onboard shrimp boats that use ice as their refrigeration.

In April 1999, a 62-foot fishing vessel was reported a week overdue and a search ensued. After locating the vessel 21 nautical miles southwest of Cape San Blas, FL, a Coast Guard Utility Boat was dispatched to investigate the situation. A boarding team accessed the vessel and discovered three crewmembers lying in the cargo hold. The fishing nets were subsequently cut loose and the vessel was towed to Panama City. Various agencies, Coast Guard personnel and a coroner met the vessel at the dock. At the dock, the cargo hold was eventually certified gas free and the deceased crewmembers were removed.

The suspected cause of death for the 1999 incident was the improper use of sodium metabisulfite. This food preservative is commonly used for many products including fruits, vegetables, and shrimp. On vessels, it is mixed in measured proportions with water and then bags of shrimp are dipped into it before being placed on ice. This process is normally performed on deck where ventilation is adequate. In this instance, the powdery



chemical was taken into the fish hold by bucket and spread on the bags of shrimp which were then covered with ice. It is believed that the crew thought the melting ice would mix with the powder and dissolve on to the shrimp. Attempting to mix sodium metabisulfite in a confined or space is very dangerous as the practice can produce Sulfur Dioxide (SO<sub>2</sub>), which is toxic and has a pungent irritating odor.

Sodium metabisulfite manufacturers package the chemical in plastic bags and provide instructions for use, safe handling, and personnel protective equipment (PPE) needed in English and Spanish. No PPE was noted onboard the vessel, and in this instance the Vietnamese crew did not read English or Spanish.

As a result of these discoveries the Coast Guard **strongly recommends** that Owners and Operators of all vessels:

- Maintain awareness of what hazardous materials are used onboard;
- Provide training in their use; and
- Supply PPE for those who work with the chemicals.

**Coast Guard personnel must remember that fish holds are confined spaces and should not be accessed without the proper safety equipment. It must also be noted that the common multi-gas meter in use by Marine Inspectors does not detect Sulfur Dioxide.**

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