



National Transportation Safety Board

Washington, D. C. 20594

Safety Recommendation

SP-20
Log^m 352
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Date: July 7, 1989

In reply refer to: M-89-22 and -23

Mr. Charles J. DiBono
President
American Petroleum Institute
2101 L Street, N.W.
Washington, D.C. 20007

About 2215 on August 31, 1988, an explosion in cargo tank 1 of the 711-foot-long Maltese tank vessel FIONA killed one person and blew off the top of the cargo tank. The vessel, which was moored about 2 miles offshore near the Long Island Lighting Company (LILCO) power plant at Northport, New York, was preparing to discharge about 41,000 long tons of No. 6 fuel oil, a Grade E cargo, into the LILCO subsea pipeline. Damage costs were estimated to be \$500,000.¹

As a result of its investigation, the Safety Board found that some Grade E cargoes can produce explosive vapors in vessel cargo tanks, and there is a need for vessel crews to determine whether cargo tanks contain explosive vapors before sampling or measuring cargoes. The FIONA was equipped with an operational combustible gas detecting device. It would have taken only a few minutes to determine whether the FIONA cargo tanks contained explosive vapors. Had the FIONA crew tested the cargo tanks, they would have found that all the tanks contained explosive vapors. The FIONA master could then have activated the inert gas system, vented the tanks, or taken other precautions which probably would have prevented the explosion in cargo tank 1.

To prevent fires and explosions in the cargo tanks of vessels carrying flammable products, both the International Convention for the Safety of Life at Sea, 1974 (SOLAS 1974) and Coast Guard regulations require that new tank vessels over 20,000 deadweight tons carrying crude oil and petroleum products having a flash point not exceeding 150° F (open cup), existing tank vessels over 20,000 deadweight tons carrying crude oil, and existing tank vessels over 40,000 deadweight tons carrying other than crude oil must be equipped with a fixed inert gas system which when operated will maintain the atmosphere of cargo tanks nonflammable at all times. The FIONA was an existing tank vessel of 48,915 deadweight tons and had an installed inert gas system. If the inert gas system had been operating when the vessel arrived

¹ For more detailed information, read Marine Accident Report--Explosion Aboard the Maltese Tank Vessel FIONA in Long Island Sound Near Northport, New York, August 31, 1988 (NTSB/MAR-89/03).

at New York, the explosion could have been prevented. The FIONA master did not operate the inert gas system because the FIONA was carrying a cargo with a flash point above 150° F. The international standards contained in SOLAS 1974 and the guidelines for the interpretation of Coast Guard regulations contained in the Coast Guard Marine Safety Manual do not require inert gas systems to be operated for a cargo with a flash point above 150° F. However, Coast Guard regulations required that the master operate the inert gas system as necessary to maintain an inert atmosphere in the cargo tanks while in U.S. waters while carrying a cargo with a flash point above 150° F. The FIONA master testified that he was not aware of the Coast Guard regulations regarding the operation of inert gas systems and considered compliance with SOLAS 1974 requirements as sufficient. The Safety Board believes that the reason the master did not operate the vessel inert gas system was that SOLAS did not require its operation and Coast Guard regulations and guidance are contradictory regarding the operation of inert gas systems.

A review of American Petroleum Institute (API) literature on tank vessel safety indicates that API has not developed any guidelines for the operation of inert gas systems aboard tank vessels. Because of the fire and explosion hazard of carrying petroleum products in vessel cargo tanks, the Safety Board believes that API should publish a policy stating that vessel inert gas systems should be operated, as necessary, to maintain a nonexplosive atmosphere in cargo tanks unless the tanks are gas free.

Therefore, as a result of its investigation, the National Transportation Safety Board recommends that the American Petroleum Institute:

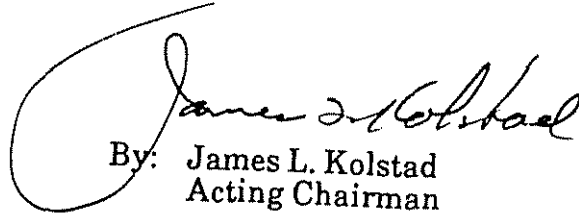
Revise the standards for sampling and measuring petroleum cargoes on vessels to include a requirement that the atmosphere of cargo tanks carrying Grade E cargoes be tested and certified nonexplosive before sampling or measuring. (Class II, Priority Action) (M-89-22)

Develop and publish standards for the use of inert gas systems aboard vessels which include a recommendation that the systems should be operated to maintain an inert atmosphere in cargo tanks when carrying petroleum products, unless the tanks are gas free. (Class II, Priority Action) (M-89-23)

The National Transportation Safety Board is an independent Federal agency with the statutory responsibility "... to promote transportation safety by conducting independent accident investigations and by formulating safety improvement recommendations" (Public Law 93-633). The Safety Board is vitally interested in any action taken as a result of its safety recommendations. Therefore, it would appreciate a response from you regarding action taken or contemplated with respect to the recommendations in this letter. Please refer to Safety Recommendations M-89-22 and -23 in your reply.

Also, the Safety Board issued Safety Recommendations M-89-12 through -21 to the U.S. Coast Guard; M-89-24 through -26 to the International Chamber of Shipping; M-89-27 through -32 to the Bedford Ship Management; M-89-33 through -35 to E. W. Saybolt, Inc., and SGS Control Services; M-89-36 and -37 to ERGON, Inc.; and M-89-38 to Underwriters Laboratories, Inc.

KOLSTAD, Acting Chairman, and BURNETT, LAUBER, NALL, and DICKINSON, Members, concurred in these recommendations.



By: James L. Kolstad
Acting Chairman