



National Transportation Safety Board

Washington, D. C. 20594

Safety Recommendation

SP-20
Log M ³⁵² ~~215~~

Date: July 7, 1989

In reply refer to: M-89-12 through -21

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Commandant
U.S. Coast Guard Headquarters
Washington, D.C. 20593

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.

Presently, there are no international requirements for the carriage of combustible gas indicator devices on tank vessels although many tank vessels are equipped with these devices for personnel safety. The Coast Guard requires that U.S. manned tank barges and tank ships carrying Grade A, B, C, or D liquids be equipped with combustible gas indicators but does not require such equipment for most U.S. tank vessels carrying Grade E cargoes. The Safety Board believes that the safety of tank vessels could be significantly improved if the Coast Guard required that U.S. manned barges and tank ships and foreign tank vessels in U.S. waters carrying Grade E cargoes be equipped with combustible gas indicator devices and that the masters of these vessels certify to the cognizant captain of the port that the vessel cargo tanks do not contain explosive vapors before sampling or measuring cargoes in U.S. ports. In

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).

addition, the Coast Guard should urge the IMO to require that all tank ships be equipped with combustible gas devices and that masters of tank vessels test cargo tanks for explosive vapors before sampling or measuring.

SOLAS 1974 requires all new tank vessels fitted with an inert gas system to have a closed ullage system. Had the FIONA been fitted with a closed ullage system, the temperature of the cargo in the cargo tanks could have been measured without having to introduce a temperature probe into the cargo tanks and the explosion probably would have been prevented. The Safety Board believes that all vessels with inert gas systems should have a closed ullage system.

Although SOLAS requires closed ullage systems on new tank vessels fitted with inert gas systems, the Coast Guard has no similar requirement or plans to incorporate such a requirement into its regulations. The Safety Board believes that this is an important safety requirement that has been recognized internationally and should be incorporated into Coast Guard regulations to minimize the potential for a fire or explosion on a tank vessel.

To prevent fires and explosions in the cargo tanks of vessels carrying flammable products, both the International Convention for 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 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.

The Coast Guard needs to correct its Marine Safety Manual regarding the operation of installed inert gas systems and to inform both U.S. and foreign vessel owners and operators that the masters of tank vessels equipped with inert gas systems are required to have the systems operational in U.S. waters unless the cargo tanks are gas free. Since the Safety Board has found that some petroleum cargoes with flash points above 150° F can produce explosive vapors in vessel cargo tanks, the Board believes that the masters of all vessels equipped with inert gas systems should operate the systems as necessary to maintain an inert atmosphere in cargo tanks unless the cargo tanks are gas free.

To identify "high priority" vessels, the Coast Guard requires every foreign tank vessel to report its estimated arrival time 24 hours in advance to the cognizant Captain of the Port (COTP). The Coast Guard maintains a computerized vessel history of all foreign tank vessels that have previously called at a U.S. port on its Marine Safety Information System (MSIS). The vessel history includes a listing of any outstanding deficiencies from previous Coast Guard boardings. If a vessel is not found in the MSIS, it should mean that the foreign tank vessel has never been to the United States and the cognizant COTP should consider it a high priority vessel. However, because vessels frequently change their name and their call sign, the cognizant COTP is never sure whether a vessel is not in the MSIS or has changed its name and is under a different name in the MSIS.

The Coast Guard assigns an official number to all U.S. tank vessels which stay with the vessel as long as it remains a U.S. vessel. Thus, if a U.S. tank vessel changes name or ownership, the local COTP office can identify the vessel by using the vessel's official number to interrogate the MSIS. COTP offices also can use the vessel's official number to verify that the correct vessel has been identified by comparing the official number with the official number found on the Coast Guard certificate of inspection aboard the vessel. Lloyd's Register of Shipping (Lloyd's) assigns an identification number to most U.S. and foreign tank vessels when they first enter service, but this number will not appear on any vessel documents unless the vessel is classed by Lloyd's.

The arrival of the high priority vessel FIONA at Northport, New York on August 31, 1988, illustrates the present identification problems for COTP offices. The FIONA (ex BOGLIASCO) had changed its name, ownership, and country of registry in July 1988, and the vessel was classed by the ABS. Thus, there was no way of tracking the FIONA in the MSIS unless COTP New Haven could obtain the vessel's Lloyd's number or previous name from the FIONA agent or from Lloyd's. Even if COTP New Haven had tracked down the vessel's Lloyd's number or previous name, none of the vessel's official papers would have verified that it was the same vessel.

To develop an international identification system for vessels, the International Maritime Organization (IMO) in 1987 established the Ship Identification Number Scheme which uses the Lloyd's vessel number as the IMO international number on international vessel documents. Although the Coast Guard has begun implementing the IMO Ship Identification Number Scheme for U.S. vessels, the scheme is not mandatory, and many countries may never implement the scheme. The Safety Board believes that the implementation of the IMO Ship Identification Number Scheme by all countries would improve vessel safety and minimize vessel water pollution worldwide by establishing an international scheme of identifying poorly maintained vessels. The scheme would also enable local Coast Guard COTP offices to readily identify high priority vessels entering U.S. waters. The Board also believes that the Coast Guard could accelerate the adoption of this scheme worldwide and at the same time improve its port safety program by requiring the masters of all vessels before entering a U.S. port to report their IMO international number or Lloyd's number as well as their name and call sign, and to provide written documentation of their IMO international number or Lloyd's number upon arrival at a U.S. port.

The Safety Board's review of COTP New Haven's vessel boarding procedures regarding the arrival of the FIONA indicates that actual procedures used at the time of the vessel's arrival in U.S. waters differed from the written procedures provided to the Safety Board after the explosion and those stated by the COTP New Haven port

operations officer. The stated and written procedures dictated that when the COTP New Haven duty person did not find a record of the FIONA in the MSIS on the afternoon of August 30, the duty person was to immediately contact the FIONA agent for more information and seek guidance from the port operations officer or the assistant port operations officer. Instead, the duty person simply left the case file for the assistant port operations officer, who was off duty on August 30, to review the next morning. When the assistant port operations officer reviewed the case file the next morning and found that there was no record of the FIONA in the MSIS, procedures required him to notify the FIONA agent that a tank vessel examination would be necessary before the vessel transferred cargo and that the FIONA would be prohibited entry into U.S. waters unless it had a valid certificate of financial responsibility. The assistant port operations officer did not notify the agent, but instead ordered a routine boarding of the FIONA by COTP personnel to monitor cargo operations which did not require notifying the agent. The assistant port operations officer stated that he continued to seek information regarding the FIONA and that he did receive a report during the day on August 31 identifying FIONA as the freighter KRIOS. However, since the KRIOS record indicated no previous Coast Guard boardings and the assistant port operations officer received no further information regarding the FIONA that day, procedures would dictate that the assistant port operations officer schedule a tank vessel examination for the FIONA and verify that all the vessel certificates were in order by contacting the agent. However, the port operations officer left for the day without taking any further actions regarding the FIONA.

The duty person, who identified the FIONA as the freighter KRIOS, did not read the MSIS information regarding the KRIOS before handing it to the assistant port operations officer and incorrectly used Lloyd's to identify a name change. If a vessel had recently changed its name from FIONA to KRIOS, the agent would not be notifying the Coast Guard of the arrival of the FIONA but of the KRIOS. When the assistant port operations officer left for the day on August 31, he did not indicate to the night duty person in the search and rescue center that the FIONA boarding was other than routine. Thus, when the vessel's arrival time change was received from the FIONA agent at 1810 on August 31, it was treated as a routine message.

The port operations officer stated that COTP New Haven personnel had a healthy "paranoia" about high priority vessels and were aware of COTP New Haven boarding procedures. However, the actions of the assistant port operations officer and the duty persons indicate a cursory attitude regarding the tank vessel FIONA. In addition, COTP New Haven boarding procedures were not contained in one document for use by duty personnel until after the FIONA explosion. Although COTP New Haven personnel had no previous boarding information regarding the vessel, they were treating its arrival as routine. The assistant port operations officer stated that because he knew that the FIONA was carrying No. 6 fuel oil, he was not particularly concerned with this boarding. Although the FIONA case may have been a singular incident, the Safety Board believes that this cursory attitude indicates deficient management oversight at COTP New Haven. Moreover, the duty personnel were not provided with specific written guidance regarding COTP New Haven procedures regarding actions to follow after interrogating the MSIS. Even the written guidance provided the Safety Board after the explosion did not address the actions to take when there was no information in the MSIS regarding a vessel.

Had the assistant port operations officer contacted the FIONA agent on August 31, he would have learned that the FIONA was the former BOGLIASCO and that its last tank vessel examination was in Philadelphia on January 4, 1988. He

could then have entered the MSIS with the name BOGLIASCO and would have learned that the high priority vessel required an examination by Coast Guard marine inspection personnel before discharging any cargo. In this instance, such an examination probably would not have prevented the explosion because the Coast Guard inspectors would have found that all discrepancies had been repaired.

However, the Safety Board believes that the cursory attitude by COTP New Haven personnel regarding the arrival of the FIONA at Northport may lead to an unsafe vessel entering U.S. waters, and the COTP New Haven needs to ensure that all high priority foreign tank vessels, whether carrying No. 6 fuel oil or a more dangerous cargo, are identified and boarded in accordance with Coast Guard policies. Specific written guidance regarding what procedures to follow after interrogating the MSIS computer should be provided for all COTP New Haven watchstanders. The Coast Guard should disseminate the circumstances of this accident involving the arrival of the FIONA at Northport, without the vessel being identified as a high priority vessel to all port safety units, and review the procedures in all port safety units to ensure that written guidance is provided to all watchstanders regarding the identification of high priority vessels.

Therefore, as a result of its investigation, the National Transportation Safety Board recommends that the U.S. Coast Guard:

Require the masters of U.S. and foreign manned tank barges and tank ships carrying Grade E cargoes to certify to the cognizant captain of the port that the ship cargo tanks do not contain explosive vapors before sampling or measuring cargo in U.S. waters. (Class II, Priority Action) (M-89-12)

Require that all U.S. manned tank barges and tank ships carrying Grade E cargoes and all foreign manned tank barges and tank ships while in U.S. waters carrying Grade A, B, C, D, or E cargo be equipped with a combustible gas indicator device suitable for determining the presence of explosive concentrations of the cargo carried. (Class II, Priority Action) (M-89-13)

Urge the International Maritime Organization to require that all tank ships be equipped with a combustible gas indicator device suitable for determining the presence of explosive concentrations of the cargo carried and that the masters of tank vessels test cargo tanks for explosive vapors before sampling or measuring. (Class II, Priority Action) (M-89-14)

Require that all tank vessels in U.S. waters that are fitted with inert gas systems to have closed ullage systems. (Class II, Priority Action) (M-89-15)

Revise the Marine Safety Manual to state that masters are to operate installed inert gas systems when carrying Grade E products. (Class II, Priority Action) (M-89-16)

Inform U.S. and foreign owners and operators of the Coast Guard requirement that when in U.S. waters, the masters of tank vessels with installed inert gas systems are to operate the systems as necessary to maintain an inert atmosphere in cargo tanks when carrying petroleum cargoes, unless the tanks are gas free. (Class II, Priority Action) (M-89-17)

Require the masters of all vessels over 1,600 gross tons to report their Lloyd's Register of Shipping number or International Maritime Organization international number before arriving in U.S. waters and to provide written documentation of the vessel's Lloyd's Register of Shipping number or International Maritime Organization international number on arrival at a U.S. port. (Class II, Priority Action) (M-89-18)

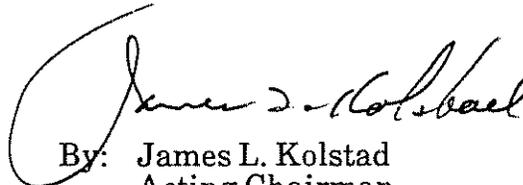
Require the Captain of the Port (COTP), New Haven to provide specific written guidance to all COTP watchstanders regarding the identification of all vessels entering the U.S. waters that may pose a safety or pollution hazard. (Class II, Priority Action) (M-89-19)

Disseminate to all Coast Guard port safety units for instructional purposes the circumstances of the failure of the Captain of the Port, New Haven to identify a tank vessel that had safety violations. (Class II, Priority Action) (M-89-20)

Review the safety procedures of all port safety units and require, where necessary, that written guidance be provided to all watchstanders regarding the identification of all vessels entering U.S. waters that may pose a safety or pollution hazard. (Class II, Priority Action) (M-89-21)

Also, the Safety Board issued Safety Recommendations M-89-22 and -23 to the American Petroleum Institute; 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