

Log M-75 ...

Log 4-46

NATIONAL TRANSPORTATION SAFETY BOARD WASHINGTON, D.C.

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Admiral Owen W. Siler
 Commandant
 U.S. Coast Guard
 Washington, D.C. 20590

SAFETY RECOMMENDATION(S)
M-75-19 thru 27

On October 3, 1973, the tankship TEXACO NORTH DAKOTA, en route from Tampa, Florida, to Port Arthur, Texas, experienced a violent explosion in the pumproom. The force of the explosion caused the forward bulkhead, the after bulkhead, and the overhead to rupture. Three persons died as a result of the explosion.

The National Transportation Safety Board determined that the probable cause of the accident was the ignition of fuel-air vapors in the pumproom by hot gases, or other products of combustion, which were being ejected from a steam-driven air compressor.

There are no Coast Guard regulations regarding the discharge of flammable or combustible cargoes into pumproom bilges, procedures for operating pumproom power ventilation systems, and the installation of air compressors in pumprooms. The operational procedures on board the TEXACO NORTH DAKOTA permitted the deliberate discharge of cargoes and cargo residue into the pumproom bilges. Since the power ventilation system was not in operation, explosive fuel-air mixtures permeated the upper pumproom where the air compressor was operating.

Other activities and conditions on the TEXACO NORTH DAKOTA can be hazardous when explosive vapors are present. One of these, the flow of fuel air vapors through air compressor piping to areas remote from the vapor source, can be eliminated by the proposed Coast Guard action of removing pumproom air compressors. However, the use of pumprooms, or any other areas where explosive vapors are not prohibited, as a workshop or a storage area for tools should not be allowed. A loose interpretation of a Coast Guard regulation which permits the use of small hand tools in such areas produces additional ignition sources which were not foreseen when the regulation was issued.

In addition to the possibility of an explosion, the presence of certain cargoes, such as benzene, can result in health impairment to crewmembers.

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Since crewmembers are required to work in the pumproom on various occasions, both deliberate and accidental cargo drainage into the pumproom bilges should be avoided.

The high-risk procedures on the TEXACO NORTH DAKOTA could have been identified and eliminated before the casualty by the application of available technological information. This information would have identified the risks involved in the use of air compressors in tankship pumprooms.

As a result of the loss of the towing vessel MARJORIE McALLISTER on November 2, 1969, the Safety Board recommended the use of systems analysis techniques to predict potential failures and accidents, and to guide requirements during the design and plan approval stages of ship construction. The explosion on the TEXACO NORTH DAKOTA indicates that the Coast Guard still is not employing adequate hazard analysis.

In the three most recently published Marine Casualty Reports involving explosions, the Safety Board cited hazards which could have been eliminated if there had been effective supervision by management. The explosion on the TEXACO NORTH DAKOTA also could have been prevented if management had identified and corrected the hazards present on the vessel.

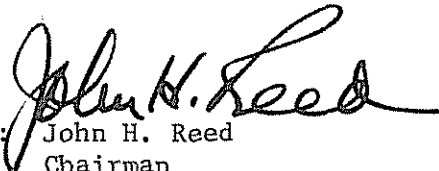
Therefore, the National Transportation Safety Board recommends that the U.S. Coast Guard:

1. Expedite the promulgation of regulations prohibiting the deliberate drainage of cargoes into the pumproom bilges of tankships. (M-75-19) (Class II)
2. Insure that piping systems entering pumprooms are designed to preclude even accidental discharge of cargoes into the pumproom bilges. (M-75-20) (Class I)
3. Expedite the promulgation of regulations prohibiting the installation of air compressors in the pumprooms of tankships and requiring the removal of air compressors already installed. (M-75-21) (Class I)
4. Issue regulations concerning the operation of tankship pumproom power ventilation systems to insure the removal of explosive vapors before any activities are begun in the pumproom. (M-75-22) (Class I)
5. Prohibit workshops and the storage of tools in pumprooms of tankships in which the bilges are not prohibited by regulation from containing cargoes or cargo residue. (M-75-23) (Class II)
6. Institute a procedure which would require an active Coast Guard search for technology available in other federal agencies before

approval is granted for new types of equipment installations which may affect hazardous materials aboard ship. (M-75-24) (Class III)

7. Use formal hazard analysis during the next annual tankship inspection to identify pumproom explosion risks. (M-75-25) (Class III)
8. Use formal hazard analysis to evaluate the possibility of an explosion before approval is given for the design or modification of tank vessels. (M-75-26) (Class III)
9. Issue regulations to require adequate management and shipboard supervision during the transportation and handling of hazardous cargoes on tankships. (M-75-27) (Class III)

Reed, Chairman, McAdams, Thayer, Burgess, and Haley, Members, concurred in the above recommendations.


By: John H. Reed
Chairman

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