

LS M-236

# NATIONAL TRANSPORTATION SAFETY BOARD WASHINGTON, D.C.

ISSUED: January 24, 1984

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Forwarded to:

Mr. William N. Johnston  
Chairman and President  
American Bureau of Shipping  
65 Broadway  
New York, New York 10006

SAFETY RECOMMENDATION(S)

M-84-9 through -11

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About 0415 on February 12, 1983, the 605-foot U.S. bulk carrier MARINE ELECTRIC capsized and sank during a storm in the Atlantic Ocean about 30 nautical miles east of Chincoteague, Virginia. Thirty-four persons were aboard. Three persons survived the accident, and the bodies of 24 persons were recovered. The other seven persons are missing and presumed dead. The MARINE ELECTRIC currently is resting in three pieces on the bottom of the ocean in about 120 feet of water; its estimated value, including the cargo, was \$12 million. 1/

Approximately 28 percent of the U.S. operating seagoing fleet is over 30 years old. The MARINE ELECTRIC, which was built in 1944 and converted in 1961, is the second U.S. registered ship built during World War II which has been lost during the last 3 years. In October 1980, the U.S. freighter POET 2/ disappeared in the North Atlantic Ocean about 500 nmi east of Delaware Bay during a severe storm. The POET was converted in 1964 by Bethlehem Steel Corporation Ship Building Division, Sparrows Point, Maryland, from a MARAD Design C-4 troopship built by Kaiser Company, Inc., of Richmond, California in 1944. Although the Safety Board in the last 3 years also investigated the total loss of three major U.S. vessels 3/ less than 10 years old, the loss of the POET and the MARINE ELECTRIC indicate that owners, operators, the American Bureau of Shipping (ABS), and the U.S. Coast Guard (USCG) may need to subject older vessels to more comprehensive inspections.

1/ For more detailed information, read Marine Accident Report--"United States Bulk Carrier MARINE ELECTRIC Capsizing and Sinking about 30 Nautical Miles East of Chincoteague, Virginia, February 12, 1983" (NTSB/MAR-84/01).

2/ For more detailed information, read Marine Accident Report--"Disappearance of U.S. Freighter SS POET in North Atlantic Ocean about October 25, 1980" (NTSB-MAR-81-6).

3/ For more detailed information, read Marine Accident Reports--"Sinking of the M/V OXY PRODUCER in the Atlantic Ocean Near the Azores Islands, September 20, 1981" (NTSB-MAR-82-6); "Capsizing and Sinking of the U.S. Mobile Offshore Drilling Unit OCEAN RANGER off the East Coast of Canada 166 Nautical Miles East of St. John's Newfoundland, February 15, 1982" (NTSB/MAR-83/2); and "Explosion and Fire Onboard the U.S. Tankship GOLDEN DOLPHIN in the Atlantic Ocean March 6, 1982" (NTSB/MAR-83/7).

The records and testimony of the ABS surveyor and the USCG inspector who attended the 1981 drydocking of the MARINE ELECTRIC in Jacksonville, Florida, showed that a comprehensive ABS special survey No. 8 and a USCG drydocking inspection were conducted and that extensive structural renewals were required. The cargo hatch covers, however, were not hose tested or otherwise tested for weathertightness as required by ABS special survey No. 8. The records and testimony of owner representatives indicated that the "regular" repairs had been performed on the MARINE ELECTRIC's cargo hatch covers and cargo holds (to correct damage caused by unloading equipment) and the main deck between hatch coamings. The 1980 and 1981 gaugings indicated that extensive plate and stiffener renewals were required for the hull structure to meet prescribed standards. The structural calculations performed after the accident, which indicated that stresses were within design standards, used averaged wastage values in determining the longitudinal hull strength of the MARINE ELECTRIC. However, some local wastage areas may have developed during the 2-year period since the last gaugings were taken which, in the sea conditions on February 11 and 12, 1983, could have led to a local structural failure. The Safety Board believes that the MARINE ELECTRIC's continuous need for structural repairs of the hatch covers, main deck, and cargo holds (which it does not view as "regular" repairs) also indicates that a parallel deterioration of structural strength of the vessel must have been in progress over the preceding 2 years due to wasting of underwater hull plating. The next extensive gaugings would not have been required until 1985. Therefore, the Safety Board believes that the ABS and the USCG should require extensive gauging of all older vessels every 2 years during the biennial drydocking, rather than every 4 to 5 years at special surveys. If such gaugings are performed during regular drydock periods the added cost to the owner should be minimal.

Hatch covers on cargo vessels or bulk carriers, like the MARINE ELECTRIC, are required to be weathertight and not watertight. Weathertight means that in any sea condition water will not penetrate into the vessel while watertight means that the closure is the equivalent strength to the surrounding structure and water will not penetrate the vessel with the closure under a head of water. Closures in the hull are required to be watertight up to the freeboard deck, and weathertight above the freeboard deck, which, in the case of the MARINE ELECTRIC, was also the main deck.

The weathertightness and structural requirements for hatch covers are set out in the Load Line Regulations (46 CFR Part 42). The ABS has been appointed by the USCG as the "assigning authority" for the load line regulations in the United States and is the entity responsible for assuring compliance with the load line regulations concerning hatch covers. The USCG nevertheless retains an oversight responsibility and is responsible for enforcement of the load line regulations. The ABS ensures that hatch covers meet the load line regulations by approving the design and installation of hatch covers, by annually surveying hatch covers, and by hose testing hatch covers for weathertightness every 4 to 5 years in the course of special surveys. However, neither the load line regulations nor the ABS rules contain any specific guidance regarding maintaining the structural strength of steel hatch covers or related installations after construction. Testimony and records indicated that the MARINE ELECTRIC's hatch covers were not gauged at either the 1980 or the 1981 drydocking and that the surveyor attending the ship did not know if the hatch covers still met design standards. The Safety Board believes that the ABS should institute a requirement that its surveyors gauge steel hatch covers at special surveys similar to the requirement for gauging steel hulls and that they compare the results with the original design requirements.

The investigation showed that the ABS surveyor conducted a thorough survey of the MARINE ELECTRIC's hatch covers during February 1980, including the hose testing of repairs, but that he did not hose test the entire hatch cover for weathertightness because he was not conducting a special survey. The survey and hose tests were inadvertently recorded as meeting the requirements for a weathertight test so the ABS surveyor in February 1981 conducted an annual inspection of the hatch covers which did not include closing the hatch covers and hose testing for weathertightness. Since the gaskets had been renewed and new doubler plates had been installed, the ABS surveyor would not have readily detected any weathertightness problems with the MARINE ELECTRIC's hatch covers in the open position. However, on February 24, 1982, an ABS surveyor conducted an annual load line survey and found the hatch covers satisfactory, although 8 days later, an MTL port captain required that 84 doubler plates be installed. The Safety Board believes that the ABS surveyor should have noted the wasted condition of the hatch covers which required such extensive repairs.

The Safety Board is aware that since the February 12, 1983 accident, the ABS has changed its computer format so that there is a separate notation for the hose testing of steel hatch covers for weathertightness. Presently, however, the ABS does not have any specific guidance for its surveyors regarding the extent of annual load line surveys, and the USCG load line regulations simply state that the annual survey shall be of such scope and extent as to ensure that hatch covers are maintained in an effective condition. The ABS needs to revise its survey standards for annual load line surveys so that extensive wastage on hatch covers can be detected, particularly on older vessels. This may require that surveyors inspect hatch covers both in the open and closed positions during annual load line surveys and that they conduct hose tests for weathertightness more often than at special surveys.

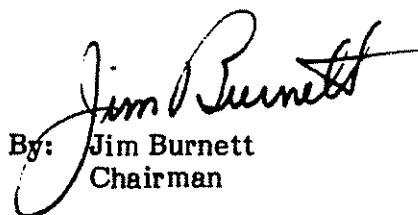
Therefore, as a result of its investigation, the National Transportation Safety Board recommends that the American Bureau of Shipping:

Require that structural gaugings of vessels be conducted at 2-year intervals after a vessel reaches 20 years of age. (Class II, Priority Action) (M-84-9)

Require that steel weatherdeck hatch covers be gauged at all special surveys. (Class II, Priority Action) (M-84-10)

Require its surveyors to examine hatch covers for wastage during all annual load line surveys. (Class II, Priority Action) (M-84-11)

BURNETT, Chairman, GOLDMAN, Vice Chairman, and BURSLEY, ENGEN, and GROSE, Members, concurred in these recommendations.

  
By: Jim Burnett  
Chairman