Log M-61A

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: June 1, 1978

Forwarded to:

Mr. Robert T. Young
Chairman
American Bureau of Shipping
45 Broad Street
New York, New York 10004

SAFETY RECOMMENDATION(S)

M-78-31 and -32

About 1915 e.s.t., on November 10, 1975, the Great Lakes bulk cargo vessel SS EDMUND FITZGERALD, with 29 crewmen and fully loaded with taconite pellets, sank in eastern Lake Superior at 46°59.9' N, 85°06.6' W, approximately 17 miles from the entrance to Whitefish Bay, Michigan. The ship was en route from Superior, Wisconsin, to Detroit, Michigan, and was proceeding at a reduced speed in a severe storm. No distress call was heard, and no survivors or bodies were located, although the vessel's two inflatable liferafts, several personal flotation devices, and other debris were found. 1/

The Safety Board's analysis of the evidence developed in its investigation of this accident indicated that topside damage to ballast tank vents and hull plating allowed flooding into the vessel's ballast tanks and its tunnel and that significant amounts of water entered the cargo hold of the FITZGERALD through nonweathertight hatch covers. Because the 1969, 1971, and 1973 amendments to the Great Lakes Load Line Regulations (46 CFR Part 45) allowed the FITZGERALD's minimum freeboard to be reduced, greater amounts of water washed over the deck from boarding seas. This greater amount of water increased the rate that flooding water entered the damaged ballast tanks and tunnel and the cargo hold. The analysis indicated that the flooding further reduced the vessel's freeboard and increased its list until the boarding seas caused a failure of one or more hatch covers. The hatch cover failure allowed rapid and massive flooding of the cargo hold.

1/ For more detailed information about this accident read "Marine Accident Report - SS EDMUND FITZGERALD Sinking in Lake Superior, November 10, 1975," (NTSB-MAR-78-3).

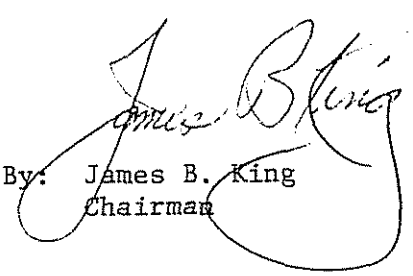
Great Lakes vessels are designed for certain seaway conditions and the hatch covers are designed for the imposed loading. Because of their relatively short voyages and the availability of shelter and protected harbors, Great Lakes vessels normally can avoid severe storms and not get caught in exposed waters as did the FITZGERALD. In order to determine when a vessel must seek shelter, the limiting sea state for Great Lakes cargo vessels should be determined.

Because the annual inspections of Great Lakes bulk cargo vessels were in progress, the Safety Board submitted two recommendations to the American Bureau of Shipping on March 23, 1978. As a result of our investigation of this accident, other recommendations have been developed.

Therefore, the National Transportation Safety Board recommends that the American Bureau of Shipping:

> Determine, in conjunction with the U.S. Coast Guard, the limiting sea state applicable to the design of Great Lakes bulk cargo vessels including freeboard and longitudinal strength. (Class II, Priority Action) (M-78-31)
>
> Determine, in conjunction with the U.S. Coast Guard, the design criteria used to determine the structural adequacy of hatch covers. (Class II, Priority Action) (M-78-32)

KING, Chairman, McADAMS, HOGUE, and DRIVER, Members concurred in the above recommendations.



By: James B. King
Chairman