



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

109# M-333B

Date: November 16, 1987

In reply refer to: M-87-94

Mr. James R. Nolan
President
Sun Refining and Marketing Company
500 W. Dutton's Mill Road
Aston, Pennsylvania 19104

About 0115 on May 9, 1986, seawater was discovered flooding the engineroom of the U.S. flag tankship PRINCE WILLIAM SOUND, which was in the Pacific Ocean about 80 nautical miles west-southwest of Puerto Vallarta, Mexico. The vessel was en route from Valdez, Alaska, to Puerto Armuelles, Panama, with a cargo of 876,000 barrels (36,120,000 gallons) of Alaskan North Slope crude oil. The water level rose rapidly, and by the time the crew discovered the flooding, the electric motor drives of the bilge pumps and the sea valves were submerged before the pumps could be started or the valves closed electrically. The crew dived into the flooding engineroom and succeeded in manually closing all but one of the main sea valves. The flooding stabilized about the 61-foot level (above the keel) of the engineroom. The vessel subsequently was towed to Long Beach, California, where the engineroom was completely dewatered. Damage to the vessel was estimated to be \$12 million. There were no injuries or fatalities.

The rapidly flooding seawater also shorted out the electric motors, which operated the bilge pumps, and the valves in the main seawater circulating system. Once the flooding was discovered, the 28-inch-diameter discharge valves on the forward and aft main seawater circulating pumps were closed manually by order of the chief engineer. The closure of the pump discharge valves isolated the engineroom from two of the three main seawater circulating system sea connections and eliminated two possible sources of the flooding. At the same time, the chief engineer should have directed someone to close the 36-inch-diameter main seawater overboard discharge valve to completely isolate the main seawater circulating system and the engineroom from the sea. Instead, the chief engineer directed the first assistant engineer to open the emergency bilge pump valves so that the emergency bilge pump could be started. Seawater continued to back-flow through the open main seawater overboard discharge valve and through the main condenser to the ruptured expansion joint.

The chief engineer should have known that sudden and rapid flooding of the engineroom is normally the result of one of two possibilities: a breach of the hull in the engineroom area or a failure in the main seawater circulating system. Isolating the main seawater circulating system from the sea by closing the main sea valves would have indicated to the chief engineer which problem existed. The chief engineer should have instructed someone to close the valves in the main seawater circulating system because it

1/ For more detailed information, read Marine Accident Report—"Engineroom Flooding of the U.S. Tankship PRINCE WILLIAM SOUND near Puerto Vallarta, Mexico, May 9, 1986" (NTSB/MAR-87/07).

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was the most likely method of controlling the seawater flooding in the engineroom. If all three valves had been closed immediately, the flooding in the engineroom would have ceased, precluding additional damage to the engineroom equipment.

In attempting to pump out the seawater in the engineroom, the crew dived repeatedly into the flooded engineroom to open the emergency bilge pump suction valve which was located just above the tanktop. Also, a belated effort was made to close the main seawater overboard discharge valve when the valve handwheel was already 20 feet underwater. It is important the engineering personnel thoroughly understand the proper procedures to follow in the event of engineroom flooding. The Safety Board believes that had procedures been established to combat various engineroom incidents, the engine department personnel would have been better prepared to react to the flooding situation.

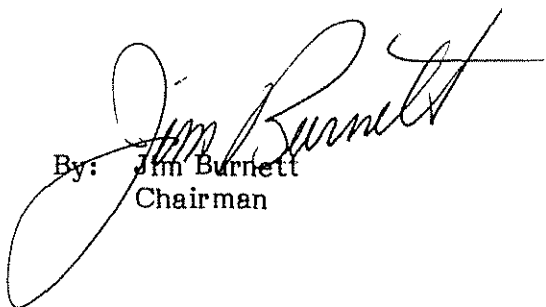
Therefore, as a result of its investigation, the National Transportation Safety Board recommends that the Sun Refining and Marketing Company:

Establish written emergency procedures for engine department personnel to follow in the event of engineroom flooding. (Class II, Priority Action)
(M-87-94)

Also, the Safety Board issued Safety Recommendations M-87-84 through -89 to the U.S. Coast Guard and M-87-90 through -93 to the American Bureau of Shipping.

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 actions taken as a result of its safety recommendations and would appreciate a response from you regarding action taken or contemplated with respect to the recommendation in this letter. Please refer to Safety Recommendation M-87-94 in your reply.

BURNETT, Chairman, GOLDMAN, Vice Chairman, and NALL and KOLSTAD, Members, concurred in this recommendation. LAUBER, Member, did not participate.


By: Jim Burnett
Chairman