189# M-87-107

National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: November 16, 1987

In reply refer to: M-87-107

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

On September 28, 1985, the Panamanian tankship GRAND EAGLE, loaded with 530,659 barrels of crude oil, grounded in the Delaware River near Marcus Hook, Pennsylvania. A cargo tank was ruptured and approximately 10,370 barrels of oil spilled into the waterway causing a considerable amount of pollution over a 12-mile section of the river and to the surrounding shorelines. Cleanup operations by Federal, State, local, and commercial crews continued for 39 days. In addition to installing a floating oil boom around the vessel after it berthed at Marcus Hook, several booms were placed across the entrances to tidal marshes and estuaries. About 8,060 barrels of oil were recovered during the cleanup operations, the cost of which exceeded $1 million. The remaining oil aboard the GRAND EAGLE was discharged at the Sun Oil terminal, and the vessel was moved to a local shipyard where temporary repairs were made. The total cost of the temporary repairs was estimated at $241,000. 1/

When functioning properly, the control-air system supplied 9 kg/cm2 (128 psi) of air pressure to various main engine, air-operated control devices which regulated the stopping, starting, speed, and rotation direction of the main engine. The engine cannot be started or run if the control-air fails while in the automatic mode. When the engineroom personnel at the remote main engine control station stopped the main engine at 2301.5, the removal of the control-air pressure by the engineer allowed the air-operated control devices to stop the flow of fuel to the main engine, to set the main engine speed governor at zero, and to move the start interlock protective device to the closed position. Sometime before 2304.5, a fracture occurred in the control-air start interlock tubing to the start interlock device which allowed the control-air to escape, resulting in insufficient air pressure to move the start interlock device to the open position. This condition, unknown to the engineroom personnel, prevented the starting of the main engine in the automatic mode from either the remote or local main engine operating station. Additionally, the control-air pressure gauges at both the remote and local main engine control stations did not indicate the drop in the control-air pressure from the level required to operate the main engine in the automatic mode. The pressure drop was not sensed at the pressure gauge because the tube fracture was located a

1/ For more detailed information, read Marine Accident Report--"Grounding of the Panamanian Tankship GRAND EAGLE in the Delaware River near Marcus Hook, Pennsylvania, September 28, 1985" (NTSB/MAR-87/10).

considerable distance from the pressure gauge sensing unit and because there was a constant supply of air pressure to the control-air system. Furthermore, the nature of the fracture was such that the pressure loss at the fracture was sufficient to prevent the admission of fuel to the engine (start interlock) but not large enough to transmit the magnitude of the loss upstream to the sensing unit.

After unsuccessful attempts to start the main engine from both the local and remote automatic control stations, the chief engineer began preparations to start the main engine manually. Manually starting the main engine required additional time to disconnect the fuel oil governor linkage and to position other engineering crewmembers to manually control the starting-air valve and the cams that control the engine rotation direction. Although the engineers had never shifted to manual control on the GRAND EAGLE, they responded correctly to manually start the engine. The lack of a control-air, low-pressure alarm forced them to go through a time-consuming procedure when time was critical for the safety of the tankship. If the control-air system instrumentation had provided accurate information about the reduced control-air pressure at the air-start interlock due to the fractured tube and if engine personnel had been alerted to the problem by an alarm, the trouble probably would have been diagnosed more quickly. The main engine probably could have been started minutes earlier, perhaps with sufficient time to avoid grounding of the tankship. In a situation where a vessel is maneuvering in a restricted waterway, even a minute delay in regaining engine control can be critical to the operation.

The Safety Board believes that a control-air, low-pressure sensor and alarm should be installed in the control-air system so that engine operating personnel would be alerted to a reduction in control-air pressure that could prevent the starting of the main engine by means other than manually. Such alarm devices are available and should be incorporated into the control-air system so that the source of a problem can be readily identified.

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

> Require that every U.S.-registered vessel with a diesel main engine pneumatic control system be equipped with a sufficiently sensitive control-air, low-pressure alarm which will be actuated when the control-air pressure drops to a level that will not permit normal engine control; the alarm should provide visible and audible indications at the engineroom local and remote control stations. (Class II, Priority Action) (M-87-107)

Also, the Safety Board issued Safety Recommendations M-87-106 to the Consolidated Maritime Service, Limited; M-87-108 through -110 to the American Bureau of Shipping; and M-87-111 and -112 to the International Association of Classification Societies.

BURNETT, Chairman, GOLDMAN, Vice Chairman, and LAUBER, NALL, and KOLSTAD, Members, concurred in this recommendation.

By: Jim Burnett
Chairman