

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: November 21, 1984

 Forwarded to:

Mr. Gary L. Kott
 President
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 550 West Lake Park Boulevard
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} SAFETY RECOMMENDATION(S)

} M-84-58 through -66

 About 2355 on October 25, 1983, the 400-foot-long United States drillship GLOMAR JAVA SEA capsized and sank during Typhoon LEX in the South China Sea about 65 nautical miles south-southwest of Hainan Island, People's Republic of China (PRC). Of the 81 persons who were aboard, 35 bodies have been located, and the remaining 46 persons are missing and presumed dead. The GLOMAR JAVA SEA currently is resting on the bottom of the sea in an inverted position in about 315 feet of water; its estimated value was \$35 million. ^{1/}

Testimony from alternate masters and engineers indicate that the responsibility for loading the GLOMAR JAVA SEA was split between the drilling superintendent, the master, and the engineers. The drilling superintendent was responsible for supplies, such as drill pipe and drill water for the drilling operation. The master was responsible for completing a stability calculation on each tour, and the engineers were responsible for keeping the drillship level and providing the master with tank soundings once a week prior to the supply vessel delivery. One master testified that he would not find out what supplies were to be put onboard the drillship until the supply vessel arrived and that sometimes all the cargo could not be offloaded at one time without overloading the drillship. The loading and distribution of weights on a drillship is critical to the safe operation of the vessel. Global Marine should designate one person to be responsible for the ordering, loading, and distribution of fuel and supplies and that person should be the master. Global Marine had made the master of the GLOMAR JAVA SEA responsible for maintaining the stability of the vessel at a safe level, but the master was not consulted as to what supplies could be loaded safely. Furthermore, the engineer routinely transferred liquids at the request of the driller without consulting the master concerning the safety of the vessel.

^{1/} For more detailed information, read Marine Accident Report—"Capsizing and Sinking of the United States Drillship GLOMAR JAVA SEA in the South China Sea, 65 Nautical Miles South-Southwest of Hainan Island, People's Republic of China, October 25, 1983" (NTSB/MAR-84/08).

Global Marine reacted quickly in notifying the U.S. Coast Guard (USCG) of the GLOMAR JAVA SEA's situation; however, valuable time was lost because necessary vessel information was not available to the U.S. Air Force Rescue Coordination Center (RCC) in the GLOMAR JAVA SEA's operating area. The Safety Board believes that Global Marine in the PRC and ARCO China, Inc., a subsidiary of the Atlantic Richfield Company (ARCO), should have had a contingency plan to notify the RCC at Kadena Air Force Base, Okinawa, Japan, immediately of the vessel's moored position, description, number and types of lifeboats/liferafts, radio call sign, type of radios, and operating frequencies.

The USCG Certificate of Inspection for the GLOMAR JAVA SEA stated that while moored the marine crew required was: one master, two able seamen, one ordinary seaman, one chief engineer, and two oilers. When navigating 16 hours or less between drilling locations, the marine crew is to be augmented by one chief mate, one able seaman, one first assistant engineer, and one radio operator. The complement for more than 16 hours in navigation is one master, one chief mate, one second mate, one third mate, one radio officer, four able seamen, two ordinary seamen, one chief engineer, one first assistant engineer, one second assistant engineer, one third assistant engineer, and three oilers. The GLOMAR JAVA SEA's typhoon plan stated that when a severe storm is 1,200 miles away, the master will place personnel on board to comply with the USCG manning requirements for the drillship while underway. Although some of the skills may have been covered by Chinese crewmembers, the requirements for licensed officers in addition to the drillship's normal crew of one master, one chief engineer, two third assistant engineers, and one radio operator would be difficult since Global Marine did not have any licensed officers other than the GLOMAR JAVA SEA's crew stationed in the PRC. Appropriate USCG licensed personnel would have had to be sent from the continental United States and clear PRC immigration.

The Safety Board believes that it is an unrealistic expectation that drillships will augment their manning in remote areas where typhoons or other severe storms are frequent. Providing USCG licensed officers on short notice at frequent intervals to remote locations from the United States is a difficult task. Even if the appropriate officers had been sent from the United States when Typhoon LEX first entered the South China Sea, they probably would not have reached the drillship because of the severe local weather conditions. While in this case the master of the GLOMAR JAVA SEA had the option to seek shelter near Hainan Island, Global Marine should have an additional master or chief mate on board in remote locations during seasons of severe storms to provide the master with sufficient crew to safely navigate the drillship to a safe location. Global Marine should have a contingency plan for providing additional crewmembers.

Although the master had the final authority to order evacuation, several crewmembers and management personnel testified that this was normally a joint decision of the ARCO supervisor, the Global Marine drilling superintendent, and the master, who normally served in an advisory capacity to the Global Marine drilling superintendent. Furthermore, only the ARCO supervisor had authority to order the helicopters or the supply vessel to carry out the evacuation. The Safety Board believes that the failure of ARCO and Global Marine to evacuate nonessential personnel in accordance with the typhoon plan may have resulted in the loss of many lives. The only essential personnel on the GLOMAR JAVA SEA, after the drill string had been hung off and the marine riser secured on deck, were those in the marine department and perhaps some Global Marine and ARCO supervisory personnel. The marine department would have been needed for disconnecting anchors Nos. 3 through 9, hauling in anchors Nos. 2 and 10, and for getting underway. About 55 to 65 of the 81 persons in the GLOMAR JAVA SEA crew would have been saved if the master and Global Marine and ARCO management

personnel had not waited for the storm to be officially declared a typhoon before evacuating nonessential personnel. Since none of the Global Marine management personnel who testified could identify the nonessential personnel on the GLOMAR JAVA SEA, there is a need for Global Marine to better define nonessential personnel in their operating manuals to eliminate confusion as to which crewmembers should be evacuated.

The GLOMAR JAVA SEA's typhoon plan may have been unrealistic in respect to the proximity of a storm which could trigger the decision to evacuate nonessential personnel or to disengage anchors. The typhoon plan required the drilling superintendent to begin securing the well and the drilling equipment when the storm was 1,200 miles away or about 400 nautical miles to the east of the Philippine Islands before he knew whether the storm would turn north or enter the South China Sea. Evacuation and the letting go of anchors by the master was to be accomplished at a storm center distance of 1,000 miles, i.e., before the storm crossed the Philippines and entered the South China Sea and with the center of the storm about 3 to 4 days away from the drillship's position. Since the South China Sea is an area of many tropical storms and typhoons with a 42-percent probability during the month of October for the occurrence of a tropical storm, but in which only few actually affect the GLOMAR JAVA SEA's operating area, the crew was reluctant to evacuate personnel and disengage anchors every time a tropical storm or typhoon entered the South China Sea. There is a need for Global Marine's management personnel in Houston to review individual drillship heavy weather plans and set realistic guidelines for the evacuation of personnel and the moving of the vessel off location due to the approach of a tropical storm, a hurricane, or a typhoon.

Neither the operating manual approved by the American Bureau of Shipping (ABS) nor the USCG gave the master of the GLOMAR JAVA SEA any guidance on the degree of survivability to which the drillship was designed. If the master had known that the GLOMAR JAVA SEA was designed only to withstand the flooding of one wing tank, he might not have permitted the chief engineer to have two adjacent wing tanks empty. The ABS no longer approves operating manuals and states that this is the responsibility of the owner. The Safety Board believes that the USCG should insure that the operating manuals of all mobile offshore drilling units (MODU's) contain information on the degree of survivability from flooding and that Global Marine should revise its existing operating manuals to include this information. Global Marine also should make it a policy that adjacent wing tanks on drillships not be empty.

ABS survey rules require that specific tanks be examined internally at each special survey about every 4 to 5 years but not at any intermediate surveys. With the increase in time for required drydocking and the exemption from drydockings for MODU's, the ABS should put more emphasis on internal tank inspections. The ABS should require surveyors to inspect a representative sample of nonfuel oil tanks on a vessel during drydocking between special surveys. The number of tanks inspected should be increased as the vessels get older. Whether or not required by the USCG and the ABS, Global Marine should inspect a representative sample of nonfuel oil tanks on its drillships at least once every 30 months and fuel oil tanks at least once every 5 years.

Soundings of the tanks to determine the liquid level would have had to have been taken by crewmembers through the main deck sounding tubes which would have been extremely difficult and dangerous with the waves washing on deck. Therefore, the Safety Board believes that Global Marine should install remote gauging devices in the enginerooms on all its drillships to provide constant monitoring of tank levels and an immediate indication of any liquid level change in the tanks due to damage or during severe weather conditions.

Therefore, the National Transportation Safety Board recommends that the Global Marine Drilling Company:

Designate the master as the individual in overall charge of the ordering, loading, and safe stowage of all drilling equipment, drilling supplies, and ship consumables aboard Global Marine drillships. (Class II, Priority Action) (M-84-58)

Require that shorebased rig managers of drillships operating in remote areas contact the cognizant rescue coordination center to preplan procedures for an emergency. (Class II, Priority Action) (M-84-59)

Provide sufficient licensed personnel during severe weather seasons either aboard drillships or ashore nearby to man a drillship operating in a remote area to safely move off location and seek shelter if threatened by a severe storm. (Class II, Priority Action) (M-84-60)

Review and revise all heavy weather plans for Global Marine drillships to include a specific list, by position, of nonessential personnel to be evacuated on the approach of a tropical storm, a hurricane, or a typhoon. (Class II, Priority Action) (M-84-61)

Review and revise all heavy weather plans for Global Marine drillships to include realistic distance and time guidelines for the evacuation of nonessential personnel, the disconnecting of anchors, and the moving off location on the approach of a tropical storm, a hurricane, or a typhoon, and require that the master take these safety measures when the conditions arise. (Class II, Priority Action) (M-84-62)

Review and revise the operating manuals of each Global Marine drillship to include information on its survivability in case of flooding, actions that should be taken by the master to minimize the effects of flooding, and countermeasures that should be taken by the master in case flooding has occurred. (Class II, Priority Action) (M-84-63)

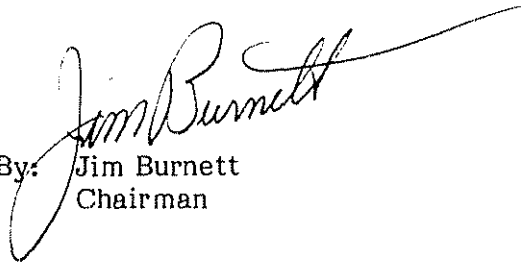
To improve the survivability of drillships, direct all masters, chief engineers, and drilling superintendents that adjacent wing tanks are not to be kept empty. (Class II, Priority Action) (M-84-64)

Require representative samples of nonfuel oil tanks on drillships be inspected internally at least once every 30 months and that representative samples of fuel tanks be inspected internally at least once every 5 years. (Class II, Priority Action) (M-84-65)

Install remote gauging systems in all drillships so the engineer on watch can immediately determine the liquid level in all tanks. (Class II, Priority Action) (M-84-66)

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 recommendations in this letter.

BURNETT, Chairman, GOLDMAN, Vice Chairman, and BURSLEY, Member, concurred in these recommendations.


By: Jim Burnett
Chairman