National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: October 16, 1998

In reply refer to: M-98-124

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About 4:50 a.m. central daylight time on October 23, 1996, in Tiger Pass, Louisiana,[1] the crew of the Bean Horizon Corporation (Bean) dredge *Dave Blackburn* dropped a stern spud[2] into the bottom of the channel in preparation for continued dredging operations. The spud struck and ruptured a 12-inch-diameter submerged natural gas steel pipeline owned by Tennessee Gas Pipeline Company (Tennessee Gas).[3] The pressurized (about 930 psig) natural gas released from the pipeline enveloped the stern of the dredge and an accompanying tug, the *G.C. Linsmier*. Within seconds of reaching the surface, the natural gas ignited.[4] The resulting fire destroyed the dredge and the tug. All 28 crewmembers from the dredge and tug escaped into the water or onto nearby vessels.[5]

On September 20, 1996, Bean was awarded a U.S. Army Corps of Engineers contract to dredge portions of Tiger Pass, including areas where several underwater pipelines were located. The Corps of Engineers provided Bean with Corps of Engineers drawings showing the approximate locations of the pipelines. On these drawings, the Tennessee Gas pipeline was shown as crossing Tiger Pass at centerline station 614+20, or 61,420 feet from the point at which Tiger Pass joins the Mississippi River.[6] A dredging contract provision, with which Bean complied,

[1]Tiger Pass is a channel through the Mississippi River delta near Venice, Louisiana, that connects the Mississippi River with the Gulf of Mexico. The channel extends partially into the Gulf of Mexico, where the sides of the pass are defined by rock jetties.

[2]A spud is a large steel shaft that is dropped into the river bottom to serve as an anchor and a pivot during dredging operations.

[3]At the time of the accident, Tennessee Gas was a division of Tenneco, Inc. Since the accident, it has become a subsidiary of El Paso Energy Corporation.

[4]The ignition source could not be determined but could have been any of a number of electromechanical devices located on the dredge in the area of the escaping gas.

[5]For more information, read Pipeline Accident Summary Report--*Natural Gas Pipeline Rupture and Fire During Dredging of Tiger Pass, Louisiana, October 23, 1996* (NTSB/PAR-98/01/SUM).

[6]The junction of Tiger Pass and the Mississippi River was used as a zero reference point by the Corps of Engineers for measuring distances downstream along the center of Tiger Pass. Postaccident measurements

required Bean to notify pipeline owners by certified mail at least 7 days before dredging within 500 feet of their pipelines and to verify the pipeline locations.

On September 22, 1996, Bean began dredging about 1,000 feet southwest of the location of the pipeline as shown on the Corps of Engineers drawing. The initial dredging operation was to move toward the Gulf of Mexico and away from the pipeline. On October 17, the crew received weather reports predicting rough weather. The supervisor of the dredging operation decided to move the operation to a more sheltered area to the northeast, near the point where the dredging had begun but still southwest of the pipeline. According to the supervisor, the plan was to begin dredging there and then move toward the northeast, toward the pipeline. Tennessee Gas was notified by phone that the dredge would soon be approaching the pipeline. Bean's project engineer on the dredge said he questioned a Tennessee Gas supervisor several times about the pipeline's exact location and was told that the location of the pipeline was marked by two pilings, one near either side of the pass.[7]

About 2 p.m., on October 19, a Tennessee Gas inspector boarded the dredge and, using information and a sketch provided by her supervisor, established a 100-foot safety zone in the area of the two pilings. In order to avoid damage to the pipeline, dredging in that area was to be done with the suction pumps only, without using the cutting head. Bean's daily quality control reports showed that the pipeline location identified by Tennessee Gas personnel did not match the location shown on the Corps of Engineers drawings.

Dredging, using only the suction pumps, proceeded across the area of Tiger Pass where the pipeline was believed to be located. The dredge's daily quality control report indicated that the ladder struck an object believed to be the pipeline about 15 feet southwest of the site identified by the Tennessee Gas inspector. Dredging then continued to the northeast to within about 130 feet of the actual pipeline location. Then, on October 20, 1996, because of improving weather, the dredging supervisor decided to return the operation to the Gulf of Mexico end of the channel where weather conditions had previously halted work. The Tennessee Gas inspector left before the dredge was moved, with an agreement that the gas company would be notified when the dredge returned to work in the area of the pipeline.

On October 22, after completing its work at the lower end of the pass, the dredge returned, at 9:40 a.m., to an area about 140 feet to the northeast of the area previously identified by Tennessee Gas as the pipeline location. The crew began dredging to the northeast, believing that the operation was outside the safety zone and moving away from the pipeline. In reality, the dredge was moving *toward* the pipeline, which was about 100 feet away. By 9:30 p.m., the cutting head had crossed over the pipeline without incident.

On October 23, at 4:50 a.m., after stopping the dredging to clean the cutting head and reset the swing anchors, the crew dropped a stern spud into the river at about station 615+12 and

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determined that the pipeline actually crossed Tiger Pass at station 615+12, or about 92 feet downstream from the Corps of Engineers' approximate location.

[7]These pilings were located at about station 618+10, about 300 feet downstream of the actual pipeline location.

directly into the Tennessee Gas pipeline, rupturing the pipeline and releasing pressurized natural gas.

Bean had established a safety program for its vessels that included initial, crew-change-out, and monthly abandon ship and man overboard drills, and weekly all-hands safety meetings. These drills and safety meetings were recorded in the vessels' log books, and written summaries were submitted to the company Loss Control Department. *Dave Blackburn* crewmembers stated that no crew list, crew team assignment, or other crew accounting procedure was in place on the vessel.

Initially, the U.S. Coast Guard on-scene commander believed that 33 crewmembers were on board the *Dave Blackburn* and the *G.C. Linsmier* at the time of the accident. The Coast Guard incident log indicates that 30 crewmembers were aboard the dredge. The required accident report (CG-2692) submitted by Bean indicated that 28 people were aboard the *Dave Blackburn* at the time of the accident, including 3 crewmembers from the tug *G.C. Linsmier*, who were having breakfast on board the dredge when the pipeline ruptured. No crewmember interviewed after the accident knew with certainty how many personnel had been on board the vessels at the time of the accident. Crewmembers stated that, after the accident, they used an informal survey and quick "head count" to determined that no crewmembers were missing.

A review of Bean's emergency response instructions and the *Dave Blackburn*'s station bill revealed no provision for accurately accounting for the number of personnel on board the dredge vessels at any one time.

The Safety Board is concerned that the emergency procedures for Bean's dredging vessels, because they did not require that an accurate and up-to-date count be maintained of all personnel aboard the vessels, were inadequate to ensure the safety of the company's crews and other personnel during an emergency. Without a system to accurately account for all personnel—including crewmembers, contractor personnel, vendors, and visitors—aboard the dredging vessels, the risk is substantial that, in the event of a serious emergency, some individuals may be left behind, perhaps with life-threatening injuries, without anyone knowing of their plight until it is too late.

The Safety Board has investigated several accidents aboard passenger and fishing vessels in which passenger and crew accountability was an issue. [8] The lack of an accurate personnel list or count has been identified in dredge accidents as well.[9]

[8] For more information, read Marine Accident Reports--*Capsizing of the Charter Passenger Vessel* San Mateo *in Morro Bay, California, on February 16, 1983* (NTSB/MAR-83/09)*; Sinking of the Charter Fishing Boat* Joan La Rie III *off Manasquan Inlet, New Jersey, on October 24, 1982* (NTSB/MAR-84/02); *Collision of the U.S. Passenger Vessel* Yankee *and the Liberian Freighter* M/V Harbelle Tapper *in Rhode Island Sound on July 2, 1983* (NTSB/MAR-84/05); *Sinking of the U.S. Fishing Vessel* Amazing Grace *80 Nautical Miles East of Cape Henlopen, Delaware, on November 14, 1984* (NTSB/MAR-85/07*); Collision between the U.S. Passenger Vessel* Mississippi Queen *and the U.S. Towboat* Crimson Glory *in the Mississippi River, Near Donaldsonville, Louisiana, on December 12, 1985* (NTSB/MAR-86/09); *Near Capsizing of the Charter Passenger Vessel* Merry Jane *Near Bodega, California, on February 8, 1986* (NTSB/MAR-86/11)*; Capsizing of the Charter Fishing Vessel* Fish-N-Fool *in the Pacific Ocean Near Roca Ben Baja California Norte, Mexico, on February 5, 1987* (NTSB/MAR-87/11)*;* and Safety Study--*Passenger Vessels Operating from U.S. Ports, 1989* (NTSB/SS-89/01).

In this accident, the speed and extent of the gas release and fire placed all crewmembers aboard the dredging vessels in grave danger. Fortunately, despite the early hour, most crewmembers were awake, alert, and able to respond quickly to the emergency. Given the rapid ignition of the natural gas and the extent of the damage to the vessels, had this accident occurred while most of the crew was sleeping, numerous serious injuries or fatalities may have occurred. The Safety Board concluded that, in even a slightly more serious accident, Bean's emergency procedures, because they did not require that a precise count be kept of the number of personnel on board the company's vessels at all times, would have been inadequate to account for and facilitate the rescue of missing crewmembers, increasing their risk of serious injury or death. The Safety Board has therefore made the following safety recommendation to Bean Horizon Corporation:

> Amend your emergency response procedures to require that an accurate count of all persons aboard your vessels be maintained at all times by someone in authority on the vessel and be accessible to the vessel operating department on shore so that the number will be readily available to emergency responders in the event of an on-board emergency. (M-98-123)

Because the Safety Board's concern about emergency procedures for dredging vessels is not limited to this one operator, the Safety Board makes the following safety recommendation to the Western Dredging Association:

> Inform your members of the circumstances of the pipeline rupture and fire in Tiger Pass, Louisiana, and urge them to amend their emergency response procedures as necessary to require that an accurate count of all persons aboard their vessels be available at all times. This count should be maintained by someone in authority on the vessel and be accessible to the vessel operating department on shore so that the number will be readily available to emergency responders in the event of an on-board emergency. (M-98-124)

Also, the Safety Board issued Safety Recommendations P-98-25 to the Research and Special Programs Administration; P-98-26 and -27 to Tennessee Gas Pipeline Company; M-98-123 to Bean Horizon Corporation; P-98-28 to the Interstate Natural Gas Association of America; and P-98-29 to the American Petroleum Institute.

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 action taken as a result of its safety recommendations. Therefore, it would appreciate a response from you regarding action taken or contemplated with

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[9]The following accidents, although not investigated by the Safety Board, highlight the confusion that can occur when rescue authorities cannot document the number of persons on board a vessel: the United Kingdom Marine Accident Investigation Branch's June 5, 1990, report of the Collision between the passenger launch *Marchioness* and MV *Bowbelle*, with loss of life on the Thames River on August 20, 1989; and the Hong Kong Marine Department's report of inquiry into the circumstances surrounding the capsizing of the Hong Kong registered training suction hopper dredger *Maas* in the approaches to Nan-sha Wan off the island of Dongao Dao on August 1993.

respect to the recommendation in this letter. Please refer to Safety Recommendation M-98-124 in your reply. If you need additional information, you may call (202) 314-6469.

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in this recommendation.

[Original Signed]

By: Jim Hall
Chairman