



# National Transportation Safety Board

Washington, D. C. 20594

## Safety Recommendation

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Date: February 7, 1992

In Reply Refer To: M-92-6 through -8

Mr. James Gaffry  
President  
Texaco Marine Services, Inc.  
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On November 6, 1990, the 723-foot-long U.S. tank ship STAR CONNECTICUT completed loading cargo and began unmooring operations from the single point mooring (spm) buoy off Barbers Point, Hawaii; the spm buoy was owned by Hawaiian Independent Refinery, Inc. (HIRI). The mooring master, who was in charge of maneuvering the vessel during the unmooring operations, was stationed on the ship's bow. The ship's master and the junior third mate were on watch in the pilothouse. An able bodied seaman (AB) was at the helm. A mooring master-in-training was also in the pilothouse in an observer status.

After the ship released the mooring chain and became free of the spm buoy, the mooring master passed the conn to the navigation bridge where the ship's master assumed control. The master maneuvered the vessel to pass inshore of the spm buoy. He then slowed the vessel and stopped the engine to allow a launch to come alongside. After several unsuccessful attempts, the launch operator maneuvered the launch alongside the tanker and the cargo gauger, the ship's agent, and the mooring master-in-training disembarked. Once the launch cleared the STAR CONNECTICUT, a service vessel came alongside the tanker and the mooring master disembarked. As soon as the service vessel cleared the tanker's side, the master began to turn the STAR CONNECTICUT to the south to head for deep water. Moments later the vessel's stern grounded on a reef.

Although no loss of life or personal injury resulted from this accident, the STAR CONNECTICUT suffered approximately \$4 million in damages. The grounding also posed a risk of a major oil spill which could have caused great environmental harm to the Hawaiian Islands. After the STAR CONNECTICUT was refloated and damage was assessed, the vessel was declared a constructive total loss.<sup>1</sup>

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<sup>1</sup>For more detailed information, read Marine Accident Report--"Grounding of the U.S. Tankship STAR CONNECTICUT Pacific Ocean, Near Barbers Point, Hawaii November 6, 1990." (NTSB/MAR-92/01).

Among other safety issues, this accident report addresses adequacy of vessel operating procedures for departing from the spm buoy at Barbers Point, Hawaii; bridge resource management training for deck watch officers of U.S.-flag vessels of more than 1,600 gross tons; and the need for tank ships that moor and unmoor at offshore oil transfer facilities to have instrumentation capable of shallow water measurement.

During his testimony as part of the investigation the STAR CONNECTICUT's master complained that there were no formalized procedures for unmooring from the HIRI spm buoy similar to those for mooring to the buoy. The Safety Board agrees that a predeparture conference between a master and a mooring master is a necessary procedure. The Safety Board believes that as the master of the STAR CONNECTICUT, he should have insisted before the unmooring operation commenced that the mooring master discuss with him what procedures would be followed for departing from the spm buoy, the manner and timing of the transfer of the conn, the intended direction from which the ship would leave the buoy, the timing and location for the transfer of personnel to the launch, and any other matters relevant to the safety of operations..

In its report of this accident, the Safety Board acknowledged that Texaco Marine Services, Inc. (Texaco) has been providing bridge resource management training to its marine officers since 1977. The Texaco "bridge resources management" course has evolved to a 5-day seminar in which officers receive a series of lectures emphasizing several team coordination principles, and plan and perform several different conning tasks on the bridge/shiphandling simulator at MSI/CAORF.<sup>2</sup> The training staff endeavors to introduce bridge resource management into the technical shiphandling tasks on the bridge simulator but the principles of these team coordination concepts are not specifically integrated into the shiphandling exercises or subsequent evaluations.

Although the master of the STAR CONNECTICUT attended Texaco's bridge resource management course in 1990, he did not implement the basic resource management function of workload distribution when he assumed the conn on the night of the grounding. The master's testimony after the accident did not indicate that he was intractable or otherwise resistant to bridge resource management principles. Rather, the Safety Board believes that the master's failure to make use of the junior third mate to take fixes emphasizes that Texaco needs to put increased focus on team coordination in its bridge resource management course, and to provide this training to deck officers at regular intervals in the future.

Authorities in marine training agree that one course in bridge resources management is not likely to provide enough training to overcome habitual individual skills at times of demanding workloads or in emergencies. According to the Maritime Training and Research Center,<sup>3</sup> a mariner will revert to his individual skills to resolve challenges in a real life situation unless he has mastered team performance skills.

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<sup>2</sup>Computer Aided Operations Research Facility (CAORF) operated for the Maritime Administration by Marine Safety International, Inc.

<sup>3</sup>Located in Toledo, Ohio, the Maritime Training and Research Center is a computer-aided instructional and research facility that offers bridge resource management training.

The Safety Board also believes that instructors of future courses should receive additional training in social interaction variables to include evaluation of team structures, individual personality issues, group and individual communication, and crew coordination problems. If Texaco continues to use bridge/shiphandling simulators in its training, the company should provide performance feedback by means of video and/or audio taped replays of their activities during exercises in conjunction with computer generated charts showing simulated vessel tracklines.

In addition, future courses should be developed by assessing the needs of Texaco deck officers in such ways as direct observation of conning and bridge management performance, critiques of previous "bridge resources management" courses, and input from working deck officers for topics and instructional materials. Training that is designed and implemented according to actual observed job requirements is more likely to obtain acceptance among officers than generic courses.

At the time of the accident, the STAR CONNECTICUT's fathometer was operating. However, the device was located in the chartroom aft of the pilot house and did not generate a readout on the bridge. In addition, the vessel's fathometer was not suitable for shallow water service.

Current U.S. Coast Guard regulations (33 CFR 164.35(h)) require that a vessel have on board an "echo depth sounding device" and a device to continuously record depth readings. However, the regulations do not define the range for which the required devices must be able to sense and record depths.

Although the lack of a suitable depth monitoring device with readout capability on the navigation bridge was not causal to the grounding of the STAR CONNECTICUT, the Safety Board believes that if the vessel had been outfitted with such a device, the master and the junior third mate would have had an additional cue that the tank ship was approaching dangerously close to a shoal. Such a device may have spurred them to have taken earlier action to avoid the grounding.

In the Safety Board's opinion, the safety of tank ship navigation would be enhanced if vessels were required to carry a depth sounding device suitable for shallow water which has readout capability on the navigation bridge. Catastrophic environmental harm and expensive clean-up operations can result from a tank ship grounding. The 1989 costs to clean up spilled oil from the grounding of the EXXON VALDEZ were estimated at \$1.85 billion. As long as oil and oil products are carried by ships, the potential for a recurrence of this type of disaster exists. However, in the Safety Board's view, providing navigating watch standers on tank ships with additional cues to warn them of impending shoal areas may lessen the likelihood that such an accident will occur.

Therefore, the National Transportation Safety Board recommends that the Texaco Marine Services, Inc.:

Require that company masters confer with the mooring master prior to unmooring at all offshore oil transfer facilities to discuss the weather and sea conditions, and to specify what unmooring procedures they intend to follow, what path the ship will take to sea, when the conn will pass to the ship's master or navigation watch officer, and any other matters relevant to the safety of operations. (Class II, Priority Action) (M-92-6)

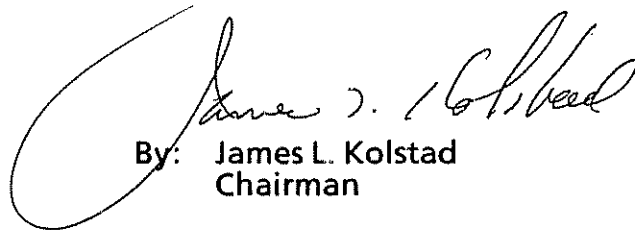
Design and develop bridge resource management courses for initial and recurrent officer training that teach principles of resource management and emphasize team coordination in addition to shiphandling skills. (Class II, Priority Action) (M-92-7)

Install a fathometer that is suitable for shallow water service and has readout capability on the navigation bridge on all company tank ships that moor and unmoor at offshore oil transfer facilities located within the territorial sea of the United States. (Class II, Priority Action) (M-92-8)

Also, the Safety Board issued Safety Recommendations M-92-1 through -4 to the U.S. Coast Guard; and Safety Recommendation M-92-5 to the Hawaiian Independent Refineries, Inc. The Safety Board is also reiterating Safety Recommendation M-91-6 to the U.S. Coast Guard.

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 respect to the recommendations in this letter. Please refer to Safety Recommendations M-92-6 through -8 in your reply.

KOLSTAD, Chairman, COUGHLIN, Vice Chairman, and LAUBER, HART and HAMMERSCHMIDT, Members, concurred in these recommendations.

  
By: James L. Kolstad  
Chairman