



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: May 3, 2006

In reply refer to: M-06-12 and -13

Mr. Bill Kolokithas
CEO
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The National Transportation Safety Board (Safety Board) is an independent Federal agency charged by Congress with investigating transportation accidents, determining their probable cause, and making recommendations to prevent similar accidents from occurring. We are providing the following information to urge your organization to take action on the safety recommendations in this letter. The Safety Board is vitally interested in these recommendations because they are intended to prevent accidents and save lives.

The recommendations address preventive maintenance on your company's vessels and firefighting training for your company's crewmembers. The recommendations derive from the Safety Board's investigation of the fire on board the small passenger vessel *Express Shuttle II* near Port Richey, Florida, on October 17, 2004, and is consistent with the evidence we found and the analysis we performed.¹

The morning of October 17, 2004, a fire broke out in the engineroom of the *Express Shuttle II* while it was entering the Pithlachascotee River after delivering 78 passengers to the offshore casino boat *Royal Casino I*. Only the master and two deckhands were on board at the time. They tried to fight the blaze with portable extinguishers, but when the fire burned out of control, they prepared to abandon ship. A passing recreational boat rescued the crewmembers. Firefighters from Port Richey and Pasco County fought the blaze, but the vessel, valued at \$800,000, was destroyed.

As a result of its investigation, the Safety Board determined that the probable cause of the fire on board the *Express Shuttle II* was a fractured, improperly installed fuel-injection line on the inboard side of the starboard engine that allowed diesel fuel to spray onto the engine and ignite. Contributing to the cause of the fire was the failure of

¹ For further information, see National Transportation Safety Board, *Fire on Board U.S. Small Passenger Vessel Express Shuttle II, Pithlachascotee River Near Port Richey, Florida, October 17, 2004*, Marine Accident Report NTSB/MAR-06/02 (Washington, DC: NTSB, 2006).

Paradise of Port Richey to have a preventive maintenance program, which could have identified the company's ongoing problem with the vessel's fuel lines before a failed line led to the fire. Contributing to the extent of the damage were the vessel's faulty fire detection system and the crew's failure to employ proper marine firefighting techniques.

On-scene investigation of the *Express Shuttle II*'s wreckage found that the fuel line to cylinder 5 on the starboard engine had fractured and that the entire length of the line was without support clamps. Other lines on the starboard engine were clamped (investigators found seven other clamps), but none of the clamps was secured to the engine block. On service calls to the *Express Shuttle II* during the week before the fire, technicians from Ring Power Corporation, the local authorized representative of Caterpillar, Inc., the engine manufacturer, noted that several fuel lines on the starboard engine lacked clamps.

The fuel supply lines were removed from the *Express Shuttle II*'s starboard engine and sent to the Safety Board's materials laboratory in Washington, D.C., for examination. The laboratory found that the line to cylinder 5 had failed because of metal fatigue at the base of the ferrule on the fuel-pump end of the line. The laboratory concluded that "the total lack of clamping led to excessive vibrations that caused the line to fatigue and fail." The laboratory also found indications of "vibrational contact" between two other fuel injection lines (Nos. 1 and 3) on the starboard engine. The lines were worn through more than 20 percent of their diameters, "another indication of incorrect clamping or other installation problems," according to the laboratory's report.

From interviews with company personnel, Safety Board investigators determined that the fuel lines on the *Express Shuttle II* had failed numerous times in the months before the fire. Invoices show that between January and October 2004, Paradise of Port Richey purchased a total of 13 replacement fuel lines, all for the *Express Shuttle II*'s starboard engine, according to the evidence. Investigators determined that Paradise of Port Richey waited until a fuel line fractured before repairing it and did not keep accurate records of such repairs. In addition, employees who performed the repairs did not consult the engine manufacturer's service manual. If company personnel had consulted the service manual, they would have seen the following warning about improperly installed fuel line clamps and recognized that the failing fuel lines posed a fire hazard:

Incorrectly installed clamps may allow the fuel injection lines to vibrate and become damaged. The damaged lines may leak and cause a fire.

The Safety Board concluded that the frequent need to replace fuel lines on the *Express Shuttle II* should have alerted Paradise of Port Richey that it had a problem with the fuel lines, which, if addressed, would have shown that the fuel lines were not being properly installed. The Board further concluded that a written preventive maintenance program could have identified and eliminated the underlying cause of the fuel line failures, thereby avoiding the failure that led to the fire that destroyed the *Express Shuttle II*. Paradise of Port Richey did not have a preventive maintenance program, and Coast Guard regulations do not require small passenger vessels to have such a program. The Board has recommended to the U.S. Coast Guard that it establish

such a requirement, but in the meantime, the Board believes that Paradise of Port Richey should develop and implement a preventive maintenance and inspection program for systems affecting the safe operation of its vessels, including the hull and the mechanical and electrical systems.

An effective preventive maintenance program contains elements such as procedures for reporting maintenance and repair needs, for retaining and reviewing maintenance and repair records, for conducting vessel inspections and repairs according to manufacturers' guidelines, for verifying and testing repairs, and for overseeing the maintenance and repair process, as well as procedures that promote effective interaction between the personnel who operate vessels and the staff who perform vessel maintenance. Materials published by the Passenger Vessel Association (PVA) could help Paradise of Port Richey establish a preventive maintenance program. The PVA publishes a number of sample documents on its website (www.passengervessel.com) that the company could download and adapt for its own use. Included are worksheets on which to list engine specifications and track engine maintenance, forms for recording equipment purchases, repairs, inspection, and maintenance, and daily and weekly checklists.

The Safety Board found that the crewmembers' firefighting efforts were ineffective in controlling or extinguishing the *Express Shuttle II* fire because they lacked adequate firefighting training and because the master did not take appropriate fire suppression measures. Rather than securing the engineroom ventilation and closing all access to the space containing the fire, the deckhands opened the hatches to the engineroom at least three times, feeding the fire with oxygen each time. The vessel was equipped with a carbon dioxide fire-extinguishing system; however, the master did not try to activate it when he had the opportunity, and neither deckhand even knew about the suppression system.

The master told investigators that he had received a "little bit" of firefighting training before he obtained his mariner's license. The deckhands had not undergone any emergency training, including fire drills, although they had worked 1 and 2 months, respectively, for Paradise of Port Richey.² The master told investigators that he had never conducted a drill with either of the deckhands "because they were new."³ Based on the information obtained from interviews and the deficiencies demonstrated by the crew of the *Express Shuttle II*, the Board believes that Paradise of Port Richey should develop and implement a training program in marine firefighting for its crewmembers. To do so, the company could use the training videos and written material related to basic firefighting and marine fire safety developed by the PVA and made available for a small fee.

² Title 46 *Code of Federal Regulations* (CFR) section 185.420 requires that "the owner, charterer, master or managing operator shall instruct each crewmember, upon first being employed and prior to getting underway for the first time on a particular vessel and at least once every three months, as to the duties that the crew member is expected to perform in an emergency."

³ The regulations also require masters to "conduct sufficient fire drills to make sure that each crew member is familiar with his or her duties in case of a fire" (46 CFR 185.524).

Therefore, the National Transportation Safety Board recommends that Paradise of Port Richey, Inc.:

Develop and implement a preventive maintenance and inspection program for systems affecting the safe operation of your vessels, including the hull and the mechanical and electrical systems. (M-06-12)

Develop and implement a training program in marine firefighting for your crewmembers. (M-06-13)

The Safety Board has also issued safety recommendations to the U.S. Coast Guard and to Caterpillar, Inc. We urge you to take action on the safety recommendations in this letter. The Board would appreciate a response from you within 90 days addressing the actions you have taken or intend to take to implement our recommendations. Please refer to Safety Recommendations M-06-12 and -13 in your reply. For additional information, you may call Captain Michael Brown at (202) 314-6174.

Acting Chairman ROSENKER and Members ENGLEMAN CONNERS, HERSMAN, and HIGGINS concurred in these recommendations.

[Original Signed]

By: Mark V. Rosenker
Acting Chairman