National Transportation Safety Board

Washington, DC 20594

Safety Recommendation

Date: May 8, 2009

In reply refer to: M-09-6 and -7

Mr. Kishore Rajvanshy
Managing Director
Fleet Management Ltd.
16th Floor MassMutual Tower
38 Gloucester Road
Wanchai, Hong Kong

The National Transportation 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 designed to prevent accidents and save lives.

These recommendations address the training and oversight of the crew of the containership M/V *Cosco Busan*, for which Fleet Management Ltd. provided technical management. The recommendations are derived from the Safety Board's investigation of the November 7, 2007, allision of the *Cosco Busan* with the Delta tower of the San Francisco–Oakland Bay Bridge and are consistent with the evidence we found and the analysis we performed. As a result of this investigation, the Safety Board has issued eight safety recommendations, two of which are addressed to Fleet Management. Information supporting the recommendations is discussed below. The Safety Board would appreciate a response from you within 90 days addressing the actions you have taken or intend to take to implement our recommendations.

On Wednesday, November 7, 2007, about 0830 Pacific standard time, the Hong Kong-registered, 901-foot-long containership M/V *Cosco Busan* allided with the fendering system at the base of the Delta tower of the San Francisco–Oakland Bay Bridge. The ship was outbound from berth 56 in the Port of Oakland, California, and was destined for Busan, South Korea. Contact with the bridge tower created a 212-foot-long by 10-foot-high by 8-foot-deep gash in the forward port side of the ship and breached the Nos. 3 and 4 port fuel tanks and the No. 2 port ballast tank. As a result of the breached fuel tanks, about 53,500 gallons of fuel oil were released into San Francisco Bay. No injuries or fatalities resulted from the accident, but the fuel spill contaminated about 26 miles of shoreline, killed more than 2,500 birds of about 50 species, temporarily closed a fishery on the bay, and delayed the start of the crab-fishing season. Total

monetary damages were estimated to be $2.1 million for the ship, $1.5 million for the bridge, and more than $70 million for environmental cleanup.[1]

The National Transportation Safety Board determined that the probable cause of the allision of the *Cosco Busan* with the San Francisco–Oakland Bay Bridge was the failure to safely navigate the vessel in restricted visibility as a result of (1) the pilot's degraded cognitive performance from his use of impairing prescription medications, (2) the absence of a comprehensive pre-departure master/pilot exchange and a lack of effective communication between the pilot and the master during the accident voyage, and (3) the master's ineffective oversight of the pilot's performance and the vessel's progress. Contributing to the accident was the failure of Fleet Management Ltd. to adequately train the *Cosco Busan* crewmembers before the accident voyage, which included a failure to ensure that the crew understood and complied with the company's safety management system. Also contributing to the accident was the U.S. Coast Guard's failure to provide adequate medical oversight of the pilot in view of the medical and medication information that the pilot had reported to the Coast Guard.

As part of its investigation of this accident, the Safety Board examined the policies and practices of Fleet Management with regard to the *Cosco Busan* in an attempt to determine what role, if any, the company may have played in this accident. The Safety Board's assessment of Fleet Management was limited by its inability to re-interview the company port captain who had trained the *Cosco Busan* crew during the transit from Busan to Long Beach and Oakland or to interview or re-interview other company official.

As the vessel's management company, Fleet Management was responsible for selecting the crew, training them in ship operations, establishing the safety management system (SMS) and associated operating procedures, and ensuring that the crew complied with the SMS. The company selected crewmembers to serve on the *Cosco Busan* from crew recruited by a manning agency in China. Based on the evidence available to the Safety Board, Fleet Management appears to have selected properly qualified and certificated mariners to crew the *Cosco Busan*.

Training in Vessel Operations

Fleet Management sent the company port captain and the chief engineer to observe vessel operations for 30 days before the new crew arrived to take over the ship in Busan on October 24, 2007. When the ship departed Busan with its new crew on October 25, 2007, the company port captain and the chief engineer remained on board, and an additional Fleet Management superintendent engineer traveled with the vessel and crew to Long Beach and on to Oakland to oversee operations and train the crewmembers. Dispatching the company port captain and chief engineer to the vessel a month before the new crew took over vessel operations was a prudent course of action.

Except for the third officer, all of the vessel's deck officers were new to Fleet Management. In addition, the crewmembers had not previously worked together, and almost all

[1] For more information, see *Allision of Hong Kong-Registered Containership M/V* Cosco Busan *With the Delta Tower of the San Francisco–Oakland Bay Bridge, San Francisco, California, November 7, 2007*, Marine Accident Report NTSB/MAR-09/01 (Washington, DC: NTSB, 2009), which is available on the Safety Board website at <http://ntsb.gov/publictn/2009/MAR0901.pdf>.

were new to the vessel. To safely operate the ship, the crewmembers had to both learn about the vessel and about the way Fleet Management expected them to operate it. This was especially important because, not knowing the other crewmembers, they did not know how each performed, thus placing even more importance on the need to learn vessel operating procedures and the assignments of each within their respective purviews. According to the *Cosco Busan* deck officers that the Safety Board interviewed, on the voyage from Busan to Long Beach, deck crew referred their questions almost exclusively to the company port captain because, as noted, the other crewmembers, including the master, were themselves attempting to learn about the vessel and about company procedures. Unlike situations in which only a few new crewmembers join a vessel, nearly the entire *Cosco Busan* crew was new and thus could not turn to fellow crewmembers for information and assistance. The crewmembers were expected to learn the vessel and company procedures while at the same time carrying out vessel operations. Given the tasks that Fleet Management expected the *Cosco Busan* crew to perform on the voyage from Busan to Long Beach, the conditions under which onboard training was carried out were not optimal.

At the time they left Busan, the crewmembers were unprepared to safely operate the vessel without additional training from the company. During their brief time at the dock in Busan, the crew did perform several critical drills related to vessel safety, but the limited amount of time that the crew spent on board the vessel before departing Busan was insufficient to have enabled them to learn both about the vessel and how to operate it safely. Additionally, the *Cosco Busan* chief officer and second and third officers stated that Fleet Management, before the accident voyage, had not provided them with training in such areas as master's standing orders, passage planning, and bridge team management.

The deficient performance of the master and other members of the *Cosco Busan* bridge crew on the day of the accident can be directly tied to the failure of Fleet Management, before the accident voyage, to properly prepare the crew to operate the vessel safely and in accordance with the company's SMS. The second officer did not prepare a berth-to-berth passage plan before the vessel departed Busan, Long Beach, or Oakland, even though such plans were required by Fleet Management and even though a Fleet Management superintendent was on board for the first two departures.

At no time did the bridge crewmembers, as a team, discuss the planned outbound voyage and the respective roles to be taken by each crewmember in that voyage. As a result, no one on the bridge was able to adequately monitor the performance of the pilot and help ensure that the proposed route was being followed. This tacit delegation of authority from the bridge team to the pilot with regard to navigation was in violation of Fleet Management's SMS as well as of International Maritime Organization policies and procedures.

Neither the master nor any other bridge officer took full advantage of the capabilities of the electronic chart system. According to the voyage data recorder transcript, about 8 minutes before the allision, the pilot asked the master about the "red triangles"—as he referred to them—on the electronic chart display of the vessel's transit area. Though the pilot said later that he had never seen such symbols, the red triangles were standard representations of the navigation buoys on either side of the Delta tower of the Bay Bridge. When asked about the meaning of the red triangles, the master said, "this is on bridge." The master later stated in a deposition that when he

answered the pilot's question about the buoys, he "was just guessing," and he did not realize it was a "serious question." A more effective response by the master to the question from the pilot about the "red triangles" would have been to use the chart system's query function to call up data about the buoys. Such data may have alerted the pilot, even in his diminished cognitive state, that the red triangles marked an obstacle to be avoided, not a target to be aimed for. The fact that the master did not avail himself of this chart function suggests either that he had not been adequately trained in its use or that he had not been provided sufficient time to fully familiarize himself with its functionality.

The Safety Board therefore concludes that Fleet Management had failed to adequately train the *Cosco Busan* crewmembers, who were new to the vessel, who had not worked together previously, and who for the most part were new to the company, and this failure contributed to deficient bridge team performance on the day of the accident. The Safety Board recommends that Fleet Management Ltd., when assigning a new crew to a vessel, ensure that all crewmembers are thoroughly familiar with vessel operations and company safety procedures before the vessel departs the port.

Training in SMS Procedures

The master and the second and third officers told investigators that, while they believed that it was important to follow SMS procedures, it was impossible to follow them all under the circumstances. It is likely that their beliefs were established before they joined Fleet Management, given that two of them had only been with the company for about 2 weeks before the accident. Because of the importance attributed to SMS in maintaining safety, the Safety Board is concerned by the crewmembers' view that it was not necessary to follow all aspects of SMS. Though the master confirmed to investigators that the company port captain personally trained him in the SMS and that crewmembers "certainly . . . had to comply with SMS," Fleet Management could have conducted more extensive training and more strongly emphasized the importance of following all SMS procedures.

Because the working language of the vessel was Mandarin and because the onboard SMS manual was available only in English, only those crewmembers skilled in English could read and understand it. The master and the deck officers could do so, but at least some of the other crew reportedly could not. Thus, crew ability to review the SMS and follow the procedures in it was limited. The Safety Board concludes that providing an SMS manual to the *Cosco Busan* crew only in English and not also in the vessel's working language limited the crewmembers' ability to review and follow the SMS. The Safety Board therefore recommends that Fleet Management provide SMS manuals that are in the working language of a vessel's crew.

It is likely that had Fleet Management conducted training under more ideal circumstances, in which crewmembers were not distracted by the need to operate the vessel about which they were attempting to learn, the company could have better presented its view of the role of SMS in safe vessel operations and the importance of following the SMS. Such training was especially needed given the crewmembers' beliefs regarding the impossibility of following all SMS procedures. These beliefs had not been altered when the Safety Board interviewed several deck officers over a year after the accident. Therefore, the Safety Board

concludes that Fleet Management had not successfully instilled in the *Cosco Busan* master and crew the importance of following all company SMS procedures.

As a result of this accident investigation, the National Transportation Safety Board makes the following safety recommendations to Fleet Management Ltd.:

> When assigning a new crew to a vessel, ensure that all crewmembers are thoroughly familiar with vessel operations and company safety procedures before the vessel departs the port. (M-09-6)
>
> Provide safety management system manuals that are in the working language of a vessel's crew. (M-09-7)

The Safety Board also issued safety recommendations to the U.S. Coast Guard and the American Pilots' Association.

In response to the recommendations in this letter, please refer to Safety Recommendations M-09-6 and -7. If you would like to submit your response electronically rather than in hard copy, you may send it to the following e-mail address: correspondence@ntsb.gov. If your response includes attachments that exceed 5 megabytes, please e-mail us asking for instructions on how to use our Tumbleweed secure mailbox. To avoid confusion, please use only one method of submission (that is, do not submit both an electronic copy and a hard copy of the same response letter).

Acting Chairman ROSENKER and Members HERSMAN, HIGGINS, and SUMWALT concurred in these recommendations. Member Hersman voted to disapprove the marine accident report and filed a dissenting statement concerning the findings and probable cause for this accident, which is attached to the report.

[Original Signed]

By: Mark V. Rosenker
Acting Chairman