



# National Transportation Safety Board

Washington, D.C. 20594

## Safety Recommendation

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**Date:** February 6, 1998

**In reply refer to:** M-98-24 through -26

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Shortly after 1400 on December 14, 1996, the fully loaded Liberian bulk carrier *Bright Field* temporarily lost propulsion power as the vessel was navigating outbound in the Lower Mississippi River at New Orleans, Louisiana. The vessel struck a wharf adjacent to a populated commercial area that included a shopping mall, a condominium parking garage, and a hotel. No fatalities resulted from the accident, and no one aboard the *Bright Field* was injured; however, 4 serious injuries and 58 minor injuries were sustained during evacuations of shore facilities, a gaming vessel, and an excursion vessel located near the impact area. Total property damages to the *Bright Field* and to shoreside facilities were estimated at about \$20 million.<sup>1</sup>

This accident demonstrates that the many and diverse stakeholders in the area of the Port of New Orleans, including the Coast Guard, the State of Louisiana, the Board of Commissioners of the Port of New Orleans (the "Dock Board"), the pilot organizations, and the owners and operators of riverfront properties and nearby moored passenger ships, did not adequately prepare for or mitigate the risk of a marine casualty affecting people and property within the Port of New Orleans. Some of the stakeholders, most notably the Dock Board, had commissioned partial risk assessment studies at various times for the assets in the harbor area. Despite their limitations (in either geography or scope), these studies did provide adequate information for the stakeholders to recognize the possibility of an accident similar to the one involving the *Bright Field*.

For example, risk assessment projects predicted an increase in accidents involving collisions, rammings, and groundings due to increased river traffic. The Louisiana State University risk assessment project, in 1994, concluded that no sections of the Port of New Orleans waterfront were free of ship allisions, including the area where the high-capacity passenger vessels, gaming vessels, and riverfront properties were located. Analysis of accident

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<sup>1</sup>For more detailed information, read Marine Accident Report—*Allision of the Liberian Freighter Bright Field with the Poydras Street Wharf, Riverwalk Marketplace, and New Orleans Hilton Hotel in New Orleans, Louisiana, December 14, 1996*. (NTSB/MAR-98/01).

data for the Port of New Orleans from 1983 through 1993 (a total of 166 rammings along the left descending bank between miles 91 and 101 AHP) identified a mooring area for gaming vessels that had seen the fewest "historical allisions on the left bank." The study acknowledged, however, that no area of the left descending bank of the river had been completely free of vessel strikes during the 11-year period studied.

Several passenger vessels, including gaming, tour and cruise vessels, were allowed to dock along the left descending bank, the side of the river at highest risk. Had the *Bright Field* lost power some time later and the same accident scenario evolved, the ship would likely have rammed the gambling vessel, resulting in substantial loss of life. The cruise vessels, which had even less warning time, would quite likely also have sustained serious passenger injuries or loss of life.

While silting around the vessels' docking areas may offer some protection from ramming by deep-draft vessels at average river stages, the silt layer did not reduce water depth sufficiently to retard a runaway ship when the river was high, as it was on the day of the *Bright Field* accident. The property owners and other stakeholders within the Port of New Orleans clearly had the responsibility to establish and maintain a reasonable level of safety in the port area. The Safety Board concluded that the Coast Guard, the Dock Board, and the property owners did not adequately address the risks posed to moored vessels along the Erato, Julia, Poydras, and Canal Street wharves; as a result, under certain conditions, those vessels were vulnerable to ramming by other marine traffic.

The Coast Guard has overall responsibility for maintaining public safety in the Port of New Orleans area. Under the *Ports and Waterways Safety Act of 1972*, the Congress charged the Coast Guard with monitoring and managing risk in all U.S. ports and taking actions to maintain risk at an acceptable level. In carrying out this role, the Coast Guard must assess and manage the risk that is inherent in all commercial activities within U.S. ports. In fact, in its *1996 Performance Report*, the Coast Guard's Office of Marine Safety and Environmental Protection asserts that managing risk is its primary mission. The Safety Board concurs with this assessment and notes that the Coast Guard has the authority, the responsibility, and the experience to direct a comprehensive assessment of risk in the Port of New Orleans.

Among the factors that must be considered are risks associated with relatively high-speed navigation of the river, high river stage and rapid river current, railroad and highway bridges spanning the waterway, and the carriage of cargoes such as bulk oil or other hazardous materials or chemicals that can cause pollution, fire, or explosion. The Safety Board notes that many of the risk factors associated with river commerce within the port area have already been identified in previous risk-assessment studies and, further, that these factors may be amenable to known risk-reduction or risk-mitigation initiatives. Such initiatives might include reducing vessel speed, opening the Bonnet Carré Spillway on a more regular basis, using tugboats either as escorts or as a "barrier" to protect marine assets, adequately assessing the protection afforded by silting-in of vulnerable areas, and moving the passenger vessels to a safer location.

At the time the vessel lost propulsion, the *Bright Field* was operating at full speed in high-river and high-current conditions. In his testimony, the pilot claimed that it was necessary to

operate the *Bright Field* at maximum speed to attain reasonable maneuverability of the vessel in the operating environment of high water, rapid current, and a heavily laden ship designed to be maneuverable at lower speeds.

Several days after the accident, Safety Board investigators boarded a fully loaded vessel of similar size, displacement, and power to the *Bright Field* that was operating downbound in similar high water conditions. During this transit, the pilot did not use full speed to maneuver the ship. Each ship handles differently, but the operation of the *Bright Field* at full speed left no margin for error. For example, the main engine tripped off line because of a temporary loss of lubricating oil pressure. The oil pressure and engine operation were restored within about 2 minutes, which is a reasonable amount of time. However, operating at full speed in high-river conditions, the ship had no room to maneuver out of the emergency. The Safety Board concluded that operating a vessel at full speed in the restricted waters of the Mississippi River may not allow sufficient time or distance to recover from an emergency. The Safety Board is recommending that the Coast Guard take the lead in working with the pilot associations serving the Port of New Orleans to evaluate the impact of operating vessels at full speed in the Mississippi River and incorporate that information in its risk-management and risk-reduction strategies for the port area.

No practical physical barrier aboard ship exists that will safely stop a runaway vessel. In such an emergency, a safe outcome depends on the successful interaction of several physical and operational factors. For example, if main engine power is lost, adequate steering can usually be maintained until the ship slows enough for the anchors to be dropped. If a vessel loses its steering, engine power can be used to either slow the vessel (astern power) or, if it is a twin-screw vessel, to maneuver the ship.

Anchors are perceived as providing some level of protection by serving as “brakes” that will stop or at least slow a ship. But anchors are neither designed nor adequate for stopping a heavily loaded ship traveling at high speed. Had the *Bright Field*’s anchors been released, the anchor chain would quite likely have payed out at a speed that could not be controlled by the windlass brake, and the chain would simply have continued to run out until it parted from the ship. In this accident, the dropping of the anchor and paying out of chain could not have been expected to significantly slow, let alone stop, the ship.

Since this accident, the Coast Guard has placed renewed emphasis on having anchors at the ready (backed out of the hawsepipe, disengaged from the windlass, and being held by the brake), with a two-person forecandle watch. While having the anchors manned and at the ready may prove beneficial in certain circumstances, it is unlikely to achieve anything meaningful aboard a heavy vessel operating at relatively high speeds in the Mississippi River. Further, “increased emphasis” on having the anchors at the ready may even provide a false sense of security without effectively addressing the dangers inherent in operating heavy vessels at high speed in proximity to shoreside businesses and other marine traffic.

Quite by chance, the *Bright Field* came to rest between two docked ships in a spot not significantly larger than the ship itself. While the actions of the pilot and crew during the emergency may have been reasonable, their actions were not well-coordinated. Because a

computer simulation of the accident scenario was inconclusive, the Safety Board could not determine how changes in the nature or timing of the crew's actions may have affected the outcome. The Safety Board therefore concludes that insufficient information was available to determine whether any actions taken by the pilot and crew of the *Bright Field* would have been effective in preventing the allision or mitigating its effects. The Safety Board also concludes, however, that at several points prior to and during the *Bright Field* emergency, the pilot, master, and crew of the vessel did not exchange information that under other circumstances could have prevented or at least mitigated the effects of the accident.

In the view of the Safety Board, the performance of the *Bright Field* pilot and crew could have benefited from effective application of the principles of bridge resource management (BRM), which entails effective use of all available resources to achieve safe operations. The Safety Board has long supported mariners' use of BRM techniques and has advocated professional training in BRM.

Underlying effective BRM is an understanding that every officer, crewmember, and pilot on board a vessel is responsible for acting and for using resources in close coordination with others on the watch. The master, pilot, and conning officer use leadership skills and command authority to integrate the resources for any given passage or watch. At the same time, they must convey their receptivity to operating information that originates with subordinates. The role of those on the watch is to perform their assigned tasks responsibly, to know about or participate in determining the plans for navigation of the vessel, to be alert to departures from plans or from the expected performance of others, and to make those discrepancies known in time to avert an operational error. The practice of BRM by pilots and crew can be handicapped by intercultural or language differences, but these can often be overcome by deliberate and clear master/pilot/crew briefings.

The pilot of the *Bright Field* did not advise the master of his plans for making the river transit, including the fact that he intended to operate the ship at sea speed. Had the pilot offered, or had the master requested, information on the transit plans, not only would both men, as well as the bridge crew, have known when and where to expect various actions, but the flow of information could have enhanced coordination and confidence between the pilot, master, and crew.

If, for example, the master had asked, or the pilot had offered, information on the pilot's intended transit speed, that issue could have been discussed, and together they could have evaluated the operational consequences of proceeding at sea speed. Navigational situations can develop at any time for which an increase in speed (to improve rudder control or avoid collision) is a viable option, but, when a ship is already operating at top speed, that option is no longer available. If the pilot and master had discussed the intended speed, they could have reached a consensus on the best way to operate.

Although a discussion of intended actions can take place at any time during a transit, predeparture discussions generally provide the greatest latitude in both time and options. A predeparture discussion also avoids some of the practical logistical problems (related to obtaining another pilot) that could arise if a serious disagreement occurs between a master and a pilot once

a trip begins. Thus, discussing and agreeing on transit plans before getting underway is more efficient.

A transit plan should include intended speeds, areas of high risk due to traffic concentration, shoreside structures, or river flow characteristics, and actions to be taken in the event of various ship power or control difficulties. According to their statements, each man felt confident of his own abilities and assumed that the other was qualified to perform any duties that might be required. The lack of discussions between the master and pilot regarding emergency maneuvering procedures did not cause this accident. Still, if the actions to be taken in an emergency had been established, cooperation and coordination in the emergency that developed would probably have been enhanced, tasks could have been clearly delineated, and orders (such as the order to drop anchor) could perhaps have been given and complied with more quickly.

While the pilot was not forthcoming with information about his transit plans, the master did not tell the pilot of the inability to start the main engine from the bridge either at 1055 or when the same difficulty was encountered at 1110. In each case, engine control had to be transferred to the engine control room and back, but this information was not made known to the pilot. Had the pilot been made aware of the situation, he and the master could have discussed options, including the location of engine control (control room or wheelhouse) or use of tug escorts. If the pilot and master could not agree, the pilot could have refused to get underway from the anchorage.

If more information had been exchanged during the 3 minutes after power reduction and before the allision, the actions of the pilot and crew could have been better coordinated and perhaps more timely. Even though the eventual outcome would probably have been the same in this case, in different circumstances, more effective communication could have helped avoid or mitigate an accident.

When the pilot noticed the cessation of vibration in the vessel, he asked if there was a problem. Even though he stated that neither the master nor the mate responded, he did not ask a second time. By not following up and attempting to determine the exact nature of the problem, the pilot denied himself information that may have influenced the nature or the timing of his navigational decisions and orders.

When the pilot realized that the vessel had, in fact, lost power, he again did not converse with the master or mate. Consequently, he was unaware of what they were doing or could do to address the problem. Although the master and the mate were attempting to restore engine rpm, they did not tell the pilot of their actions.

Another information exchange between the pilot and master affected the order to drop anchor(s). During the accident sequence, the pilot first ordered the master to have someone stand by the anchors and, later, to drop the anchors. The orders were heard and understood by the master, though the pilot was unaware of that because the master did not acknowledge either order. The master attempted to carry out the order to drop anchor, but his radio communications with the carpenter at the bow were impeded by the sound of the ship's whistle. The master did not tell the pilot of the communication problem created by the whistle; instead, he went out to the

bridge wing and tried to attract the carpenter's attention by waving his arms. When this effort failed, the master tried the radio again, finally establishing intermittent contact. He still did not tell the pilot of his difficulties.

In the meantime, the pilot did not realize that he was preventing his own order from being carried out by continuing to sound the ship's whistle. Transmission of the order was delayed so long that when the master finally reached the carpenter on the radio, he deemed dropping the anchor to be an inappropriate order and countermanded it. By the time the master decided to drop the anchor, the carpenter could only make a brief effort to carry out the order before having to flee to escape injury in the imminent collision. As a result, and as confirmed by an amateur video of the accident, the anchor was not dropped before the *Bright Field* struck the wharf.

The fact that the pilot issued the order to drop anchor indicates that he believed that some value, however small, could be gained by dropping one or both anchors. Had he not believed that dropping anchors could mitigate the emergency, he was obligated to relay that information to the master so the carpenter could be told to abandon the anchor watch and remove himself to a safer position. Yet the pilot made no real effort to determine if his order had been carried out, even when he saw the master go to the bridge wing and wave his arms. If he did not recognize that effort as an attempt to communicate with the anchor watch, he should have inquired about the meaning of the master's unusual actions at such a critical time.

The lack of information exchange and feedback on the part of the master is also notable. For example, he did not tell the pilot that he had countermanded the drop-anchor order, only to reissue it a little later. Earlier in the accident sequence, he did not ensure that the pilot was fully aware of the actions he was taking to restore engine rpm. While the pilot could have inferred the master's actions from the rpm indicator, the master should have removed any ambiguity by advising the pilot of what he was doing at all times. Likewise the master could have given the pilot an estimate of the time it might take to restore engine power. If he did not know the amount of time needed, he could have asked the chief engineer. The pilot could have used each of these pieces of information as he determined which orders to issue at what time.

The need to exchange information and ensure that orders are heard, understood, and carried out is basic to the operation of any vessel. These needs are not new and are routinely carried out by mariners; however, they have in recent years been formalized as central elements of BRM. The Safety Board concludes that use of BRM precepts on board the *Bright Field* would have enhanced the exchange of information and the coordination of actions among the pilot, master, and crew during the accident sequence. The Safety Board has issued several recommendations concerning BRM since 1991. Due in part to those recommendations and the efforts of the Coast Guard, the International Maritime Organization (IMO) has issued amendments to its Standards of Training, Certification and Watchkeeping (STCW) that incorporate BRM training for watch officers effective February 1, 1997. Signatory countries are to have plans for such training programs in place by February 1, 1998. A 5-year phase-in period (from February 1, 1997) to certify licensed watch officers will follow. As signatory countries, the United States and Liberia (flag of the *Bright Field*) will require officers of vessels such as the

*Bright Field* to have BRM training. Pilots will not necessarily be subject to the same training unless they hold a Coast Guard license.

Training in BRM typically includes five generic categories of knowledge and skill development: (1) the development and performance of watch or pilot briefings; (2) maintenance of situational awareness; (3) identification of error chains (and error trapping); (4) implementation of effective bridge/vessel communication; and (5) integration (coordination) of bridge/vessel resources. In whole or in part, most of these elements were missing during the *Bright Field's* December 14, 1996, voyage.

The National Transportation therefore makes the following safety recommendation to the New Orleans Baton Rouge Steamship Pilots Association::

Encourage your members to participate in initial and recurrent bridge resource management training that teaches the principles of resource management and that emphasizes team coordination between the pilot and crew. (M-98-24)

Participate with the U.S. Coast Guard and other stakeholders in a comprehensive risk assessment that considers all activities, marine and shoreside, within the Port of New Orleans. (M-98-25)

In cooperation with the U.S. Coast Guard and other stakeholders, including Federal, State, and local agencies; private commercial entities; shipowners; and pilot associations, implement risk-management and risk-mitigation initiatives that will ensure the safety of people and property within the Port of New Orleans. (M-98-26)

Also, the Safety Board issued Safety Recommendations M-98-1 through -4 to the U.S. Coast Guard; M-98-5 and -6 to the U.S. Army Corps of Engineers; M-98-7 and -8 to the State of Louisiana; M-98-9 through -12 to the Board of Commissioners of the Port of New Orleans; M-98-13 through -15 to International RiverCenter, Inc.; M-98-16 through -18 to Clearsky Shipping Company; M-98-19 through -23 to New Orleans Paddlewheels, Inc.; M-98-27 and -28 to the Crescent River Port Pilots Association; and M-98-29 and -30 to Associated Federal Pilots and Docking Masters of Louisiana, Inc.

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-98-24 through -26 in your reply. If you need additional information, you may call (202) 314-6450.

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in these recommendations.

By:   
Jim Hall  
Chairman