



National Transportation Safety Board

Marine Accident Brief

Contact of Towing Vessel *Steve Richoux* With Mardi Gras World Pier

Accident type	Contact	No. DCA18FM022
Vessel name	<i>Steve Richoux</i>	
Location	Lower Mississippi River, mile 98, New Orleans, Louisiana 29°56.03' N, 090°03.50' W	
Date	May 7, 2018	
Time	About 1848 central daylight time (coordinated universal time – 5 hours)	
Injuries	None reported	
Property damage	>\$3 million est.	
Environmental damage	None	
Weather	Clear, visibility 10 miles, winds west 5.5 mph, air temperature 82°F, water temperature 64°F	
Waterway information	Lower Mississippi River at New Orleans. The river stage at the time of the accident was 12 feet and falling, with an estimated river current of 5–6 knots.	

On May 7, 2018, about 1848 local time, the towing vessel *Steve Richoux* with five crewmembers was downbound on the Mississippi River in New Orleans, Louisiana, pushing six loaded cement barges when a steering system failure occurred. The pilot and the captain tried to regain steering control of the vessel. Despite their efforts, the *Steve Richoux* struck the Mardi Gras World pier at mile 98. No pollution or injuries were reported; estimated property damage exceeded \$3 million.

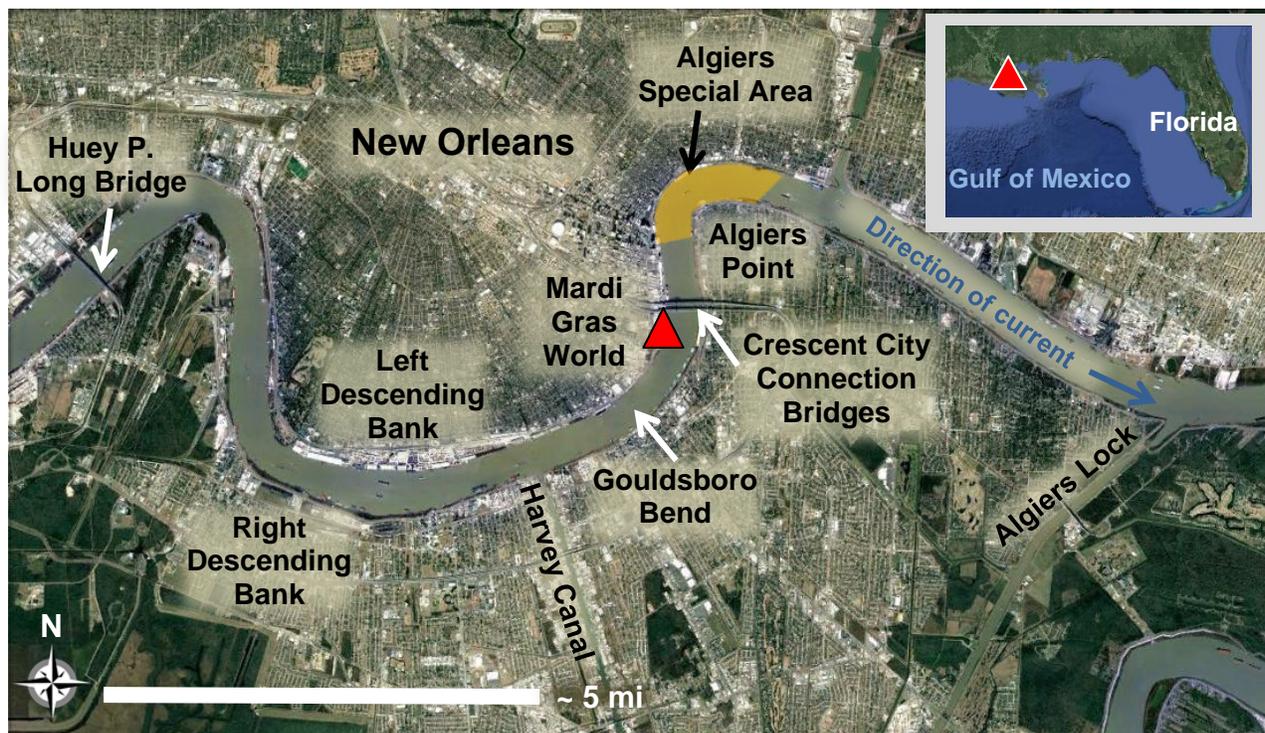


Steve Richoux under way before the accident. (Source: US Coast Guard)

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Background

The *Steve Richoux*, a twin-propeller towing vessel, was powered by two Caterpillar 3508 diesel engines capable of producing 1,800 horsepower. The vessel was built in 1976 by Calumet Shipbuilding Company in Morgan City, Louisiana. It was owned by Marquette Transportation and homeported in New Orleans.



Satellite image of the Mississippi River in New Orleans. The accident site at Mardi Gras World is shown in the center of the image, overlaid with a red triangle. (Map data by Google Earth)

During high-water conditions on the Mississippi River, personnel with the Coast Guard's Vessel Traffic Service (VTS) Lower Mississippi River manage all vessel movement approaching, entering, and transiting in the Algiers Special Area (between miles 93.5 and 95) near where the accident occurred. A high-water condition exists when the river stage is 8 feet or above normal river levels and rising, or 9 feet and above normal river levels and falling. The Carrollton Gage, which is maintained by the US Army Corps of Engineers and located at mile 102.8 on the Mississippi River, provides current and historical water-level information to assist in determining the stage of the river. According to VTS, when high-water conditions exist, the river current can increase significantly. Vessel movement management is accomplished through radio communications between the VTS control center and vessels and by the use of red/green vessel traffic control lights located along the river. If necessary, orders from the Coast Guard captain of the port may be issued to control vessel operations in the Algiers Special Area.

Accident Events

On May 7, 2018, the Mississippi River was at high-river stage; the Carrollton Gage measured the level as 12 feet and falling. VTS was managing vessel traffic through Algiers Point.

The pilot, an employee of Marquette who had never previously operated the *Steve Richoux*, arrived at the vessel about noon. At 1300, the vessel, with a crew of five, departed with the newly

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arrived pilot at the helm to move to a staging area south of the Huey P. Long Bridge. At that location, a tow consisting of six 200-foot-long-by-35-foot-wide hopper barges arranged two wide by three long was made up. The barges contained cement destined for Orange, Texas, via the Algiers Lock a few miles downriver. VTS instructed the pilot to remain docked because of an ongoing response to a vessel fire farther downriver at mile 89 in New Orleans, which resulted in the closing of the waterway to all vessel traffic. About 1725, VTS cleared the *Steve Richoux* to proceed downriver. The tow departed the staging area with the pilot at the helm and the captain in the wheelhouse. As the tow headed downriver, there was no indication of any operational system problems, and the voyage proceeded as expected.

About 1825, when nearing the Harvey Canal, the pilot slowed the *Steve Richoux* after VTS contacted the vessel and requested that it remain at its current location to allow a cruise ship to depart its berth near the Crescent City Connection Bridges and to also allow two deep-draft vessels to depart the anchorage south of the Algiers Special Area.

At 1831, VTS cleared the *Steve Richoux* to continue the transit, and the pilot increased speed to about 8 mph and proceeded downriver. As the tow approached the Crescent City Connection Bridges, the pilot lined up the vessel and barges to pass under the bridges close to the river's right descending side bank (shown in the previous image).¹ The pilot then coordinated a meeting arrangement with the bridge team on the upbound bulk carrier *Pretty Keel*. They agreed to pass starboard-to-starboard before or just under the bridges, requiring the *Steve Richoux* to move toward the center of the river and the bulk carrier closer to the river's right descending bank.

Shortly after the tow entered Gouldsboro Bend at 1841 and was heading toward the Crescent City Connection Bridges, the pilot moved the controls on the flanking rudders "hard to port" to prevent the vessel from going too far toward the left descending bank. As he did that, he began having difficulty maintaining his intended heading, so he moved the main rudders to starboard to turn the tow toward the right descending bank. However, with no helm control, the *Steve Richoux* continued to cross the river and head toward the left descending bank. The pilot and the captain tried to regain steering by repositioning the flanking and main rudder handles and by reapplying the flanking rudders hard to port and the main rudders hard to starboard. They also changed over from the no. 2 to the no. 1 steering pump, thinking that the no. 2 pump had failed, but both sets of rudders remained unresponsive. As the pilot and the captain placed the flanking rudders hard to port, an alarm—labeled as "SHIP SERV"—activated. The captain noted and silenced the alarm.

At 1847, the pilot radioed that he was losing control of the vessel. Nearby towing vessels offered assistance and proceeded toward the *Steve Richoux*. As the tow continued to approach the left descending bank of the river, the pilot placed both engines full astern, sounded the general alarm to warn the crew, and blew the vessel's whistle to warn the people on the wharf and inside a warehouse, known as Mardi Gras World, on the waterfront.

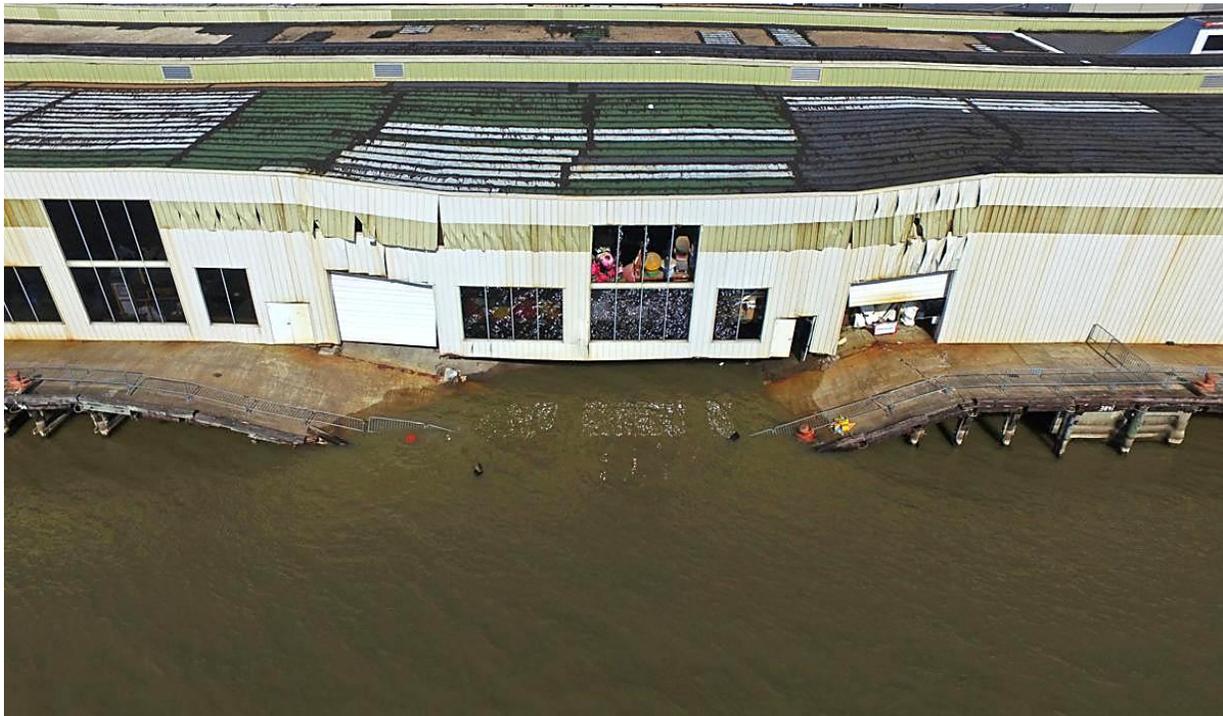
Before any assistance could arrive, the lead two barges of the tow struck the wharf at about 4 mph, causing significant damage to both the wharf and the Mardi Gras World warehouse. Two forward barges sustained minor damage; the *Steve Richoux* itself was not damaged.

¹ The banks of the Mississippi River are referred to as left and right when traveling downstream toward the Gulf of Mexico because the river meanders and can flow in any direction—south, east, west, and even north. Commercial traffic often calls the left bank the *left descending bank* and the right bank the *right descending bank*.

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Steve Richoux and barges after the accident (view downriver with the Crescent City Connection Bridges in the background). (Source: Mardi Gras World)



Damage to the Mardi Gras World warehouse and wharf. (Source: Coast Guard)

Additional Information

Crew Experience

Both the pilot and the captain were experienced towboat operators with numerous transits through the Algiers Special Area, however, neither of them had previously been assigned to the *Steve*

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Richoux. On the day of the accident, the captain had been on board the vessel for 6 days and the pilot had been on board for only 6.5 hours. For most of the time that the pilot was on board, the vessel remained stationary while the crew waited for VTS to lift the river restrictions. The three deckhands on board the vessel at the time of the casualty had many years of experience with the *Steve Richoux*.

Vessel's Steering System

The vessel's steering system consisted of two main rudders and two flanking rudders. Inland or river towing vessels use flanking rudders located forward of the propellers to provide greater maneuverability when the vessel is traveling with the river current. The steering system on board the *Steve Richoux* mechanically transferred input from the wheelhouse to the electro-hydraulic steering system located in the vessel's stern. The system used hydraulic fluid from a single reservoir, pressurized by one of two hydraulic pumps, to move an actuating ram attached to each of the four rudder posts. All four actuating rams for the flanking rudders and the main rudders were controlled from separate steering levers in the wheelhouse also referred to as "sticks." The flanking and the main rudders could be operated at the same time to steer the vessel; however, the port and starboard flanking and main rudders moved in unison because they were connected by a bar.

The port flanking rudder hydraulic ram was removed to be refurbished either before or during the vessel's 2017 drydock period. A spare rudder hydraulic ram, which was in storage on the vessel, was installed as a replacement in accordance with the company's maintenance procedure. The original ram was returned to the vessel and used as a spare, per company policy.

The steering system was last inspected after the drydock: no issues were identified. When the steering system was operationally tested by the company's engineers or by contractors, the rudders were moved back and forth to observe the movement of the rams and rudder posts and to visually examine the system for any leaks.

After the accident, the captain told investigators that during his time on the vessel, he noted that the main rudders "had a lot of slack" in the steering, which caused a delayed response. To address the delay and control the vessel effectively, he adjusted the helm sooner than normal while maneuvering. The captain did not note any problems with the flanking rudders. Conversely, the pilot told investigators he noted that the flanking rudders felt sluggish and loose, causing him to move them over further and wait for the system to start responding to the input, then pull back to prevent over-steering. There was no indication that the captain conveyed the condition of the steering system to the port engineer.

During the postaccident examination, investigators discovered hydraulic fluid leaks, but they could not determine if the leaks existed before the accident or resulted from it. They also found that the steering system had several loose linkages, including three worn half-inch ball joints on the steering rams for the rudders that required adjusting, resulting in delayed response to the helm input.

The service technician who tested and repaired the steering system postaccident found that the port flanking rudder actuating ram piston traveled an inch too far to the end of the ram, allowing the rudder to press up against the deck stops. This happened because the piston could extend farther than the distance the rudder could turn. Also, the limit cams that prevented the piston from traveling too far were not properly adjusted due to wear and did not stop the hydraulic supply when the rudder was in the hard-to-port position. This issue would have caused the system to over-pressurize if the flanking rudders were placed hard to port, as the hydraulic pump remained on-stroke and continued to generate hydraulic pressure.

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Left, the port flanking rudder steering hydraulic ram that was removed after the incident. Right, the port flanking rudder steering system with the original steering ram in place.

The system was designed so that, if over-pressure occurred, a hydraulic pressure relief valve would lift, protecting the fittings, piping, hoses, and pumps. The “SHIP SERV” alarm would also sound and illuminate in the wheelhouse. The service technician told investigators that this alarm indicated high hydraulic system pressure.



Alarm panel located on the starboard side of the wheelhouse near the deck. The alarm labeled “SHIP SERV” indicated that the steering system was over-pressurized.

Because the actuating rams for the flanking rudders and main rudders operated off the same hydraulic system, if the port flanking rudder remained in the hard-to-port position and the relief valve continued to lift, the system would not hold normal operating pressure for the rams. Therefore, even if an operator switched between the two hydraulic pumps to maintain system pressure, the rudders would not respond to any additional commands because the relief valve was located on the

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discharge side of the pump, preventing adequate oil flow from reaching the hydraulic pistons and developing the required pressure to move the rams.



Steering hydraulic pump motors that operated the flanking and main rudders.

According to a postaccident service report, crewmembers who regularly operated the *Steve Richoux* before the accident would receive intermittent alarms in the wheelhouse, which they would have to silence. The condition was never reported to the company's port engineer. The company's vice president of engineering also stated that during the daily vessel status briefs after the drydock period, no information was passed to the head office about the steering system not operating properly. After the accident, a service technician was able to replicate the alarm-activating condition and failure of the steering system by placing the flanking rudders hard to port.

Analysis

Because of their limited time on board the *Steve Richoux*, neither the captain nor the pilot knew what the SHIP SERV alarm actually indicated. The captain's decision to place the pilot at the helm of the vessel despite the pilot's lack of familiarity with the vessel prior to transiting the congested waterway increased the risk to the safety of the vessel and crew.

After the tow entered Gouldsboro Bend and was being maneuvered to line up for a vessel meeting, a steering failure of the flanking rudders occurred after the pilot moved the sticks hard to port. Not realizing the cause of the steering failure, both the pilot who was at the helm and the captain

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who was in the wheelhouse cycled the steering levers for the flanking rudders hard to port several times in an effort to counteract the effect of the current as it moved the vessel from the river's right descending bank toward the left descending bank. Although the alarm listed as "SHIP SERV" activated and was silenced in the wheelhouse, neither the captain nor the pilot realized that its activation meant that the steering system was over-pressurized. Had the alarm been labeled as such, they would have known that the system had a problem.

Towing vessel regulations that took effect after the accident (on July 20, 2018) contain rules for alarms and monitoring. They include that towing vessels "must have a reliable means to provide notification when an emergency condition exists or an essential system develops problems that require attention." The regulations also state that summary alarms at operating stations are permitted, but the specific alarms must then be indicated at the machinery. Aboard the *Steve Richoux*, the over-pressurization alarm was a specific-condition alarm indicated at the operating station (wheelhouse).

The pilot and the captain tried switching the steering gear pumps to regain control of the vessel but doing so had no effect because the steering loss was caused not by the failure of a steering gear pump but by over-pressurization of the hydraulic system. Steering could not have been restored until the system pressure returned to normal. In an effort to control the vessel, the pilot's rudder commands included placing the flanking rudders hard to port, which unbeknownst to the pilot and captain was the source for the continued over-pressurized condition and subsequent continued lifting of the relief valve, which prevented normal system operating pressure from being restored. Had the captain or the pilot understood the cause of the steering failure, they would only have had to move the flanking rudders off the hard-to-port position to regain steering.

The operational testing of the steering gear system following the 2017 drydock period would not have discovered the over-travel by the port flanking rudder's hydraulic ram piston, because the testing did not place the rams in the hard-to-port position long enough to over-pressurize the hydraulic system. In addition, the maintenance program and reporting system for the vessel was not effective because the crewmembers who had direct experience with the flanking rudder steering issue prior to the accident did not report related alarms to the company's maintenance personnel for repair.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the contact of the *Steve Richoux* tow with the Mardi Gras World pier was a loss of steering control due to a recurring yet unreported problem with the vessel's steering system.

Labeling of Alarms

Accurate labeling of alarms pertaining to critical machinery and essential systems is crucial so that vessel operators understand the nature of problems or failures. Quickly understanding what specific condition exists allows crewmembers and/or the operating company to take timely and appropriate action to mitigate or correct the condition.

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Vessel Particulars

Vessel	<i>Steve Richoux</i>
Owner/operator	Marquette Transportation Company, LLC, River Division
Port of registry	New Orleans
Flag	United States
Type	Towing vessel
Year built	1976
Official/IMO number	568988
Classification society	N/A
Construction	Steel
Length	85 ft (25.9 m)
Draft	11 ft (3.4 m)
Beam/width	30 ft (9.14 m)
Gross tonnage	262
Engine power; manufacturer	1,800 hp (1342kw); Caterpillar 3508, marine diesel engine
Persons on board	5

NTSB investigators worked closely with our counterparts from Coast Guard Sector New Orleans throughout this investigation.

For more details about this accident, visit www.nts.gov and search for NTSB accident ID DCA18FM022.

Issued: June 19, 2019

The NTSB has authority to investigate and establish the probable cause of any major marine casualty or any marine casualty involving both public and nonpublic vessels under Title 49 *United States Code*, Section 1131(b)(1). This report is based on factual information either gathered by NTSB investigators or provided by the Coast Guard from its informal investigation of the accident.

The NTSB does not assign fault or blame for a marine casualty; rather, as specified by NTSB regulation, “[NTSB] investigations are fact-finding proceedings with no formal issues and no adverse parties . . . and are not conducted for the purpose of determining the rights or liabilities of any person.” Title 49 *Code of Federal Regulations*, Section 831.4.

Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by conducting investigations and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report. Title 49 *United States Code*, Section 1154(b).
