



National Transportation Safety Board

Marine Accident Brief

Contact of Bulk Carrier *Shandong Fu En* with Ergon-St. James Terminal Wharf

Accident type	Contact	No. DCA18FM020
Vessel name	<i>Shandong Fu En</i>	
Location	Lower Mississippi River near mile 161, Convent, Louisiana 30°01.82' N, 090°50.40' W	
Date	April 6, 2018	
Time	0637 central daylight time (coordinated universal time – 5 hours)	
Injuries	None	
Property damage	\$6.25 million est.	
Environmental damage	None	
Weather	Visibility 10 miles, mostly cloudy, winds south-southeast 11 knots; air temperature 70°F; morning twilight 0621, sunrise 0645, evening sunset 1723, evening twilight ends 1947	
Waterway information	Lower Mississippi River has a project depth of 45 feet at the accident location; high-water conditions were in effect, with the current about 5.4 mph (4.7 knots). The distance between the north end of the Ergon-St. James Terminal and the south end of the Convent Marine Terminal wharves is 1,479 feet (451 meters).	

About 0637 on April 6, 2018, while turning around to head downriver with the assistance of three tugboats, the bow of the bulk carrier *Shandong Fu En* struck Dock 1 of the Ergon-St. James Terminal wharf at mile 160.7 on the Lower Mississippi River during high-water conditions. The *Shandong Fu En*, loaded with coal, had just departed the Convent Marine Terminal wharf, located across the river at mile 160.9. No pollution or injuries were reported, but the vessel and the wharf sustained \$6.25 million in damage.



Shandong Fu En before the accident. (Photo by Vincent Maritime)

Accident Events

Built in 2017, the *Shandong Fu En* was a 751-foot-long and 105-foot-wide bulk carrier powered by a slow-speed, direct-drive diesel engine. On April 4, 2018, the vessel moored at the Convent Marine Terminal wharf (mile 160.9) at 1735 and began loading coal for export. The vessel was moored with its bow upriver and had three towboats along the vessel's port side in case the force of the current, moving at about 4.7 knots, threatened the vessel's moorings.¹ The river was at high-water stage (14 feet at the New Orleans Carrollton Gage).

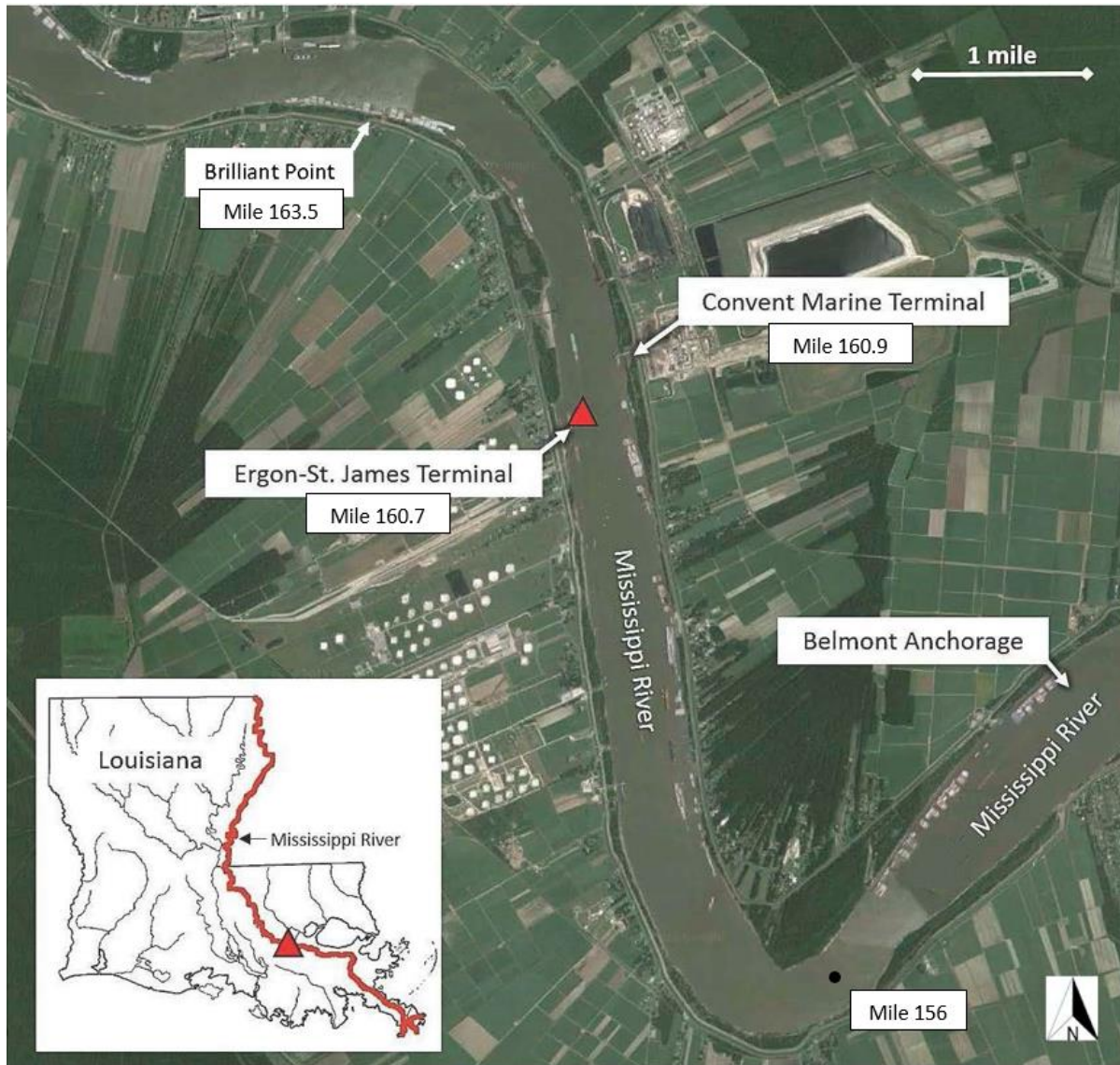


Image of the Mississippi River near Convent, Louisiana. The accident site is marked by a red triangle. (Background by Google Maps)

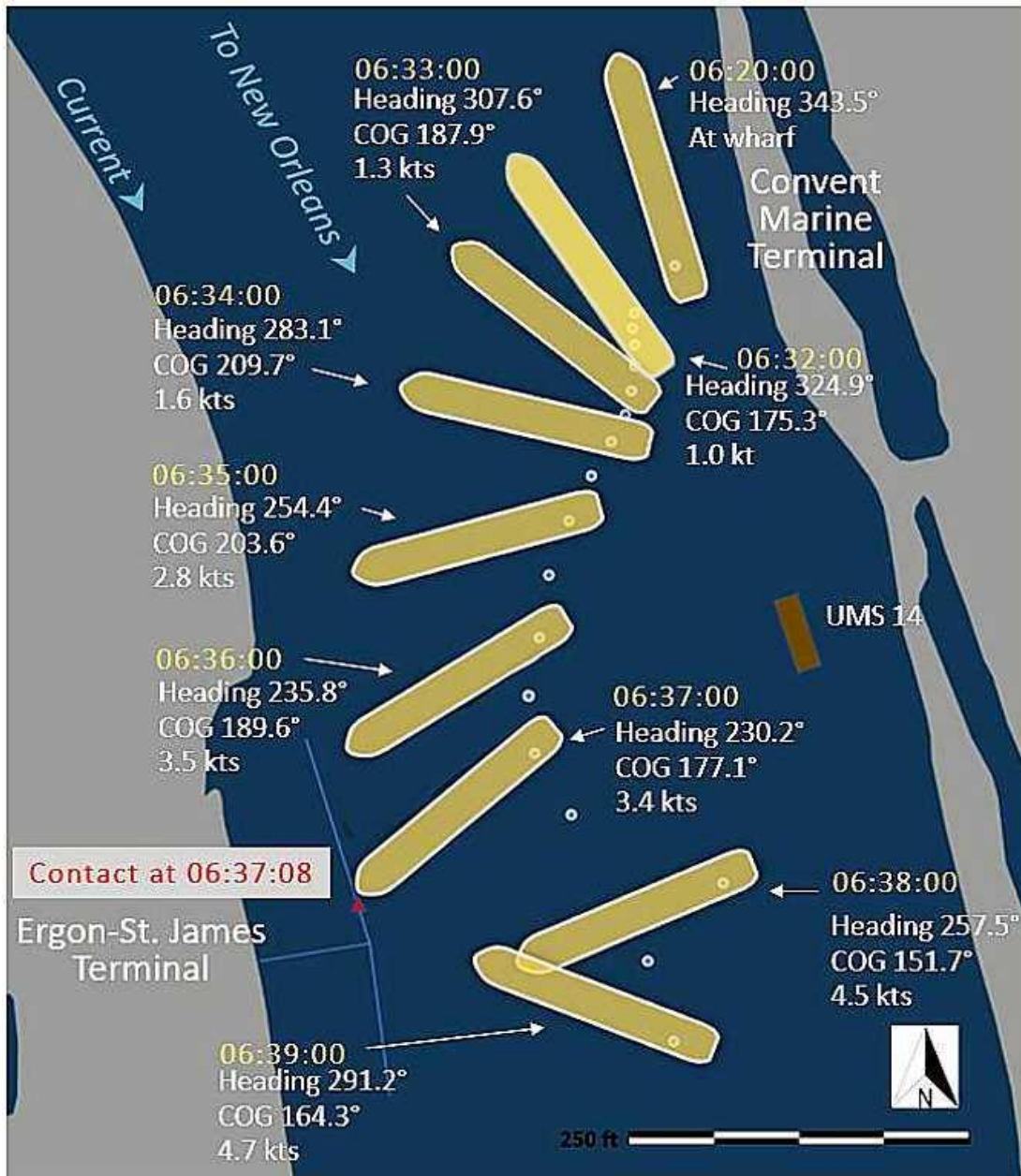
As an extra precaution during high-water conditions, pilots and tugboats are employed to help keep deep-draft vessels alongside the berth. Therefore, at midnight on April 5, while the *Shandong Fu En* was still loading, a pilot with the New Orleans and Baton Rouge Association

¹ Flood stage is 17 feet and above on the Carrollton Gage.

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(NOBRA) came on board the vessel. He planned to stay on board to guide the ship to an anchorage in Reserve, Louisiana, 24 miles downriver at mile 137.

The crew tested the ship's propulsion, steering, and other systems before getting under way; no issues were noted. Three tugboats were assigned to assist the bulker, whose draft was 44 feet, turn in the river. Within the confines of the riverbanks and in the vicinity of the wharf, the pilot planned to swing the vessel's bow to the left/port, across the southbound current and come to a course of 178 degrees (from its original heading of 343 degrees as it lay alongside the wharf) for the voyage downriver.



Trackline of the *Shandong Fu En* from 0620 to 0639, showing the vessel's heading and course over ground (COG). (Map data by Google Maps)

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At 0610, the pilot gave orders to begin moving the *Shandong Fu En*. Tugboat *Admiral Jackson* was positioned on the port bow and made fast to the bulker; the *Ned Ferry* was amidships on the port side, not made fast; and the *G. Shelby Friedrich* was at the port quarter, near the stern, not made fast. The pilot provided direction and engine orders to the tugboats and rudder and engine orders to the *Shandong Fu En* crew. With the last lines let go at 0628, the pilot gave orders to move the bulker forward and 150 feet away from the wharf. Usually, he would move a vessel only 30–40 feet away from the Convent Marine Terminal wharf. He told investigators he moved further away from the wharf before beginning the turn to mitigate the risk of colliding with the 220-foot-long-by-65-foot-wide derrick barge *UMS 14* moored astern of the *Shandong Fu En*. He told investigators that once away from the wharf, he planned to make sternway so that the bulker's pivot point would be one-third of its length from the stern. This way, the river current acting on the *Shandong Fu En*'s starboard side would swing the bow counterclockwise.

Voyage data recorder data showed that maneuvering began at 0629:17 as the bulker's heading slowly started moving to port (from 340 degrees) at a rate of turn of less than 5 degrees per minute. About 5 minutes later at 0634:08, the rate of turn momentarily reached as high as 37 degrees per minute. At 0634:56, the pilot ordered dead slow astern, the first of four astern engine orders before the accident. At 0635:09, the vessel's rate of turn had slowed to 22 degrees per minute and its course was 201 degrees, moving slowly across and down the river nearly broadside to the current. At 0635:17, the pilot ordered slow astern; 18 seconds later half astern; and 14 seconds after that, full astern. At 0636:26, thirty-seven seconds after the full-astern order, the *Admiral Jackson* captain radioed, "83 [the pilot], you're pretty close right here." The pilot responded, "I am backing all I got." Less than 15 seconds later, the bow of the *Shandong Fu En* struck the Ergon-St. James Terminal wharf. After a quick assessment of the damage, at 0637:13 the *Admiral Jackson* captain radioed that the ship had hit a mooring dolphin.



Initial impact of the *Shandong Fu En* bow swinging into the Ergon-St. James Terminal wharf at 0637:08. Inset: Screenshot of the *Shandong Fu En* 20 seconds earlier. A crack and three other holes were found in the bulk carrier's shell plate below the waterline. (Video by Ergon-St. James Terminal)

After striking the wharf, the *Shandong Fu En* continued swinging until the vessel was turned around. The pilot then navigated the vessel 13 miles downriver, anchoring the bulk carrier in the Middle Grandview Anchorage (mile 146.8) at 0850. Surveyors examined the vessel and

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found the forepeak flooded from four penetrations of the shell plate below the waterline—a 6.6-foot-by-2.1-foot crack and three 5.9-inch diameter holes. The initial estimate to repair the damage to the bulk carrier was \$250,000. The Ergon-St. James Terminal sustained about \$6 million in damage to mooring dolphins and walkways.



Damaged walkway at the Ergon-St. James Terminal about 4 hours after the accident. Inset: Damaged dolphin. (Photo by Coast Guard)

Additional Information

The pilot had 18 years of experience as a pilot, with the last eight of those years on the Mississippi River, including periods of high-water conditions. He told investigators he had moored or undocked 12–20 vessels at the Convent Marine Terminal wharf.

The pilot’s 96-hour work/rest history form indicated his only sleep in the previous 36 hours took place the previous day, between 1400 and 1800. The form also showed he had been called (dispatched) to the *Shandong Fu En* 8 hours after his previous assignment, and at the time of the accident, he had been on watch for 12 of the previous 24 hours. Louisiana regulations governing mandatory rest periods for river pilots (LAC 46:LXX.6311) required that “all pilots shall have a minimum of eight hours rest period between turns.” A turn is defined as the time from dispatch to the termination of the allotted travel time after leaving a ship. The rules also prohibited pilots from exceeding “12 bridge hours in any 24-hour period.”

High-water conditions and associated swift currents are a concern to mariners on the Mississippi River. On the day of the accident, the current was 5.4 mph. Due to the high-water conditions, a pilot and three tugboats were employed to keep the *Shandong Fu En* alongside the dock.

Regulations and restrictions were implemented by the NOBRA Board of Examiners beginning in December 2018 to address high-water concerns for moored vessels. These included temporarily amending their mandatory rest period regulations.² Beginning on January 17, 2019, all NOBRA pilots were required to have “a minimum of 12 hours rest period between turns” and on March 14, 2019, the new restrictions also required that a “pilot

² The NOBRA Board of Examiners regulates, supervises, and oversees the NOBRA pilots and is charged (by the Louisiana legislature) with maintaining safety of maritime commerce along the Mississippi River.

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dispatched to ensure a vessel remains stable at a safe berth shall serve no more than six consecutive bridge hours.” Additionally, NOBRA implemented operational rules: 1) on December 14, 2018, mooring and unmooring operations were restricted to daylight hours at a berth that required the use of a mooring boat (assist tugboat); 2) on February 28, 2019, southbound vessels were restricted to daylight transits only and required a pilot on board anchored vessels with a draft of 35 feet or more; and 3) on April 26, 2019, a daylight-only restriction was applied to northbound vessels. These regulations and restrictions remained in effect at the time this marine accident brief was published.

Analysis

No mechanical issues were reported with the tugboats that would have limited the pilot’s use of these assets to safely turn the vessel around in the waterway, nor were issues reported with the bulker’s steering or engines. According to the three towboat captains who assisted the *Shandong Fu En*, three assist tugboats—maybe even four—were the usual number necessary in high-water conditions to safely move a vessel such as the *Shandong Fu En* off the dock and turn it around. However, after the bulker came off the dock, the river current quickly began to move the vessel toward the right descending bank and downriver. The towboats could have been positioned differently and the full-astern engine orders could have been executed earlier to keep the bulker from drifting. The pilot had completed this maneuver dozens of times previously and was familiar with the challenges of the river being at high-water stage and running at more than 5 mph.

The purpose of work/rest rules, like the rest period regulations for the NOBRA pilots, “is to promote rest and recuperation between periods” of work.³ Rules and regulations applicable to mariners do not stipulate the amount of sleep they should acquire before standing watch or serving as a pilot. Instead, the rules focus on providing an opportunity to sleep. During rulemaking to address work/rest regulations, the Coast Guard described rest periods as time a mariner would “be allowed to sleep” and said rest included providing mariners with hours away from work so they can “sleep without being interrupted.”⁴ Internationally, the International Maritime Organization (IMO) emphasizes that “seafarers are [should be] provided with adequate sleep opportunity”⁵ and that “duty scheduling and planning is a key factor in managing fatigue.” Allowing and providing mariners an opportunity to sleep does not guarantee that they will. The NOBRA policies setting a minimum time between assignments and a limit on hours worked in a 24-hour period followed the Coast Guard and IMO guidelines for providing pilots an opportunity to sleep between assignments.

Even for experienced pilots, fatigue can affect performance in various ways, such as increased reaction times, reduced alertness, and difficulty processing information. It can, therefore, degrade a person’s ability to stay alert and attentive to the demands of safely controlling a vessel. Despite the pilot’s 96-hour work/rest history showing he complied with regulations, he had only 4 hours of sleep in the 36-hour time span before the accident. The pilot’s limited sleep and the fact that he was nearing the end of an 8-hour shift increased the likelihood that fatigue affected his

³ FR 34518, June 26, 1997; Interim Final Rule: Implementation of the 1195 Amendments to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 (STCW).

⁴ Title 46 *Code of Federal Regulations* 15.1101(a)(4) defines rest as a period of time during which a person is off duty, is not performing work (which includes administrative tasks such as chart corrections or preparation of port-entry documents), and is allowed to sleep without being interrupted.

⁵ Guidelines on Fatigue, MSC.1/Circ.1598, 24 January 2019, Annex, page 27.

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judgment while directing three tugboats and maneuvering the *Shandong Fu En* in challenging high-water conditions.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the contact of bulk carrier *Shandong Fu En* with the Ergon-St. James Terminal wharf was the fatigued pilot's misjudgment of a downstream turning maneuver during high-water conditions.

Mitigating Risk of Fatigue during High-Water Conditions

Pilot organizations have recognized that even for experienced pilots, fatigue can degrade performance especially in challenging conditions aboard deep-draft vessels. Since the accident, the NOBRA Board of Examiners instituted new procedures to mitigate the risk associated with operating deep-draft vessels in high-water conditions on the Mississippi River. These procedures include increasing the sleep opportunity for pilots by 1) lengthening the time between turns from 8 to 12 hours, and 2) reducing the work hours for attended moored vessels from 8 to a maximum of 6 hours per shift. They also include limiting pilot transits and mooring operations to daylight hours.

Vessel Particulars

Vessel	<i>Shandong Fu En</i>
Owner/operator	Compass Shipping 10 Corp Ltd
Port of registry	Hong Kong
Flag	Hong Kong
Type	Bulk carrier
Year built	2017
Official number (US)	N/A
IMO number	9734719
Classification society	China Classification Society
Construction	Steel
Length	751.3 ft (229 m)
Draft	44 ft (13.4 m)
Beam/width	105 ft (32 m)
Gross or ITC tonnage	44,120 gross tons
Engine power, manufacturer	13,319 hp (9,932 kW), Single MAN, model 6S60ME-C8.2
Persons on board	20

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 DCA18FM020.

Issued: June 12, 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. 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).
