



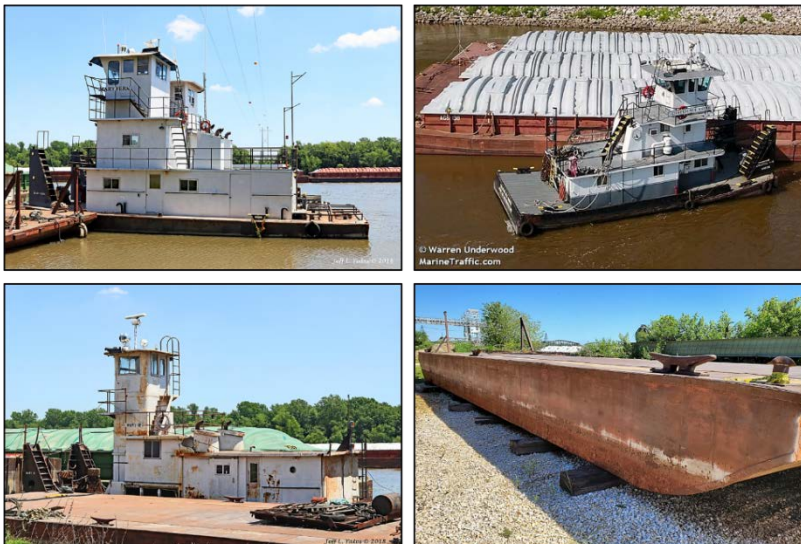
National Transportation Safety Board

Marine Accident Brief

Flooding and Subsequent Sinking of Unnamed Deck Barge and Moored Towing Vessels *Chattie Sue Smith*, *Mary Fern*, and *Mary-R*

Accident type	Flooding	No. DCA19FM043
Vessel names	<i>Chattie Sue Smith</i> , <i>Mary Fern</i> , <i>Mary-R</i> , and unnamed deck barge	
Location	Illinois River, mile 20.7; Hardin, Illinois ¹ 39°08.56 N, 090°37.01 W	
Date	July 5, 2019	
Time	About 0600 central daylight saving time (coordinated universal time – 5 hours)	
Injuries	None	
Property damage	\$920,000 est.	
Environmental damage	About 2,800 gallons of diesel fuel released (mostly recovered)	
Weather	Visibility 8 miles, few clouds, winds southwest 4 knots, air temperature 77°F, sunrise 0608	
Waterway information	The Illinois River is navigable from northern through central Illinois. At the time of the accident, the current was estimated at 1–2 mph; the river was about 6 feet above flood stage.	

On July 5, 2019, about 0600 local time, the towing vessels *Chattie Sue Smith*, *Mary Fern*, *Mary-R*, and an unnamed deck barge sank in the Illinois River at mile 20.7 while moored at the Jersey County Grain Company facility in Hardin, Illinois. No crewmembers were aboard any of the vessels. Approximately 2,800 gallons of diesel fuel were released into the river and mostly recovered. Damage to the vessels, deck barge, and facility totaled an estimated \$920,000.



Counterclockwise from top right: Towing vessels *Chattie Sue Smith*, *Mary Fern*, and *Mary-R* at various times and locations before the sinking. At the bottom right is the unnamed barge after the accident. (Source: Warren Underwood, Jeff L. Yates, and Hex Stone)

¹ All miles in this report are statute miles.

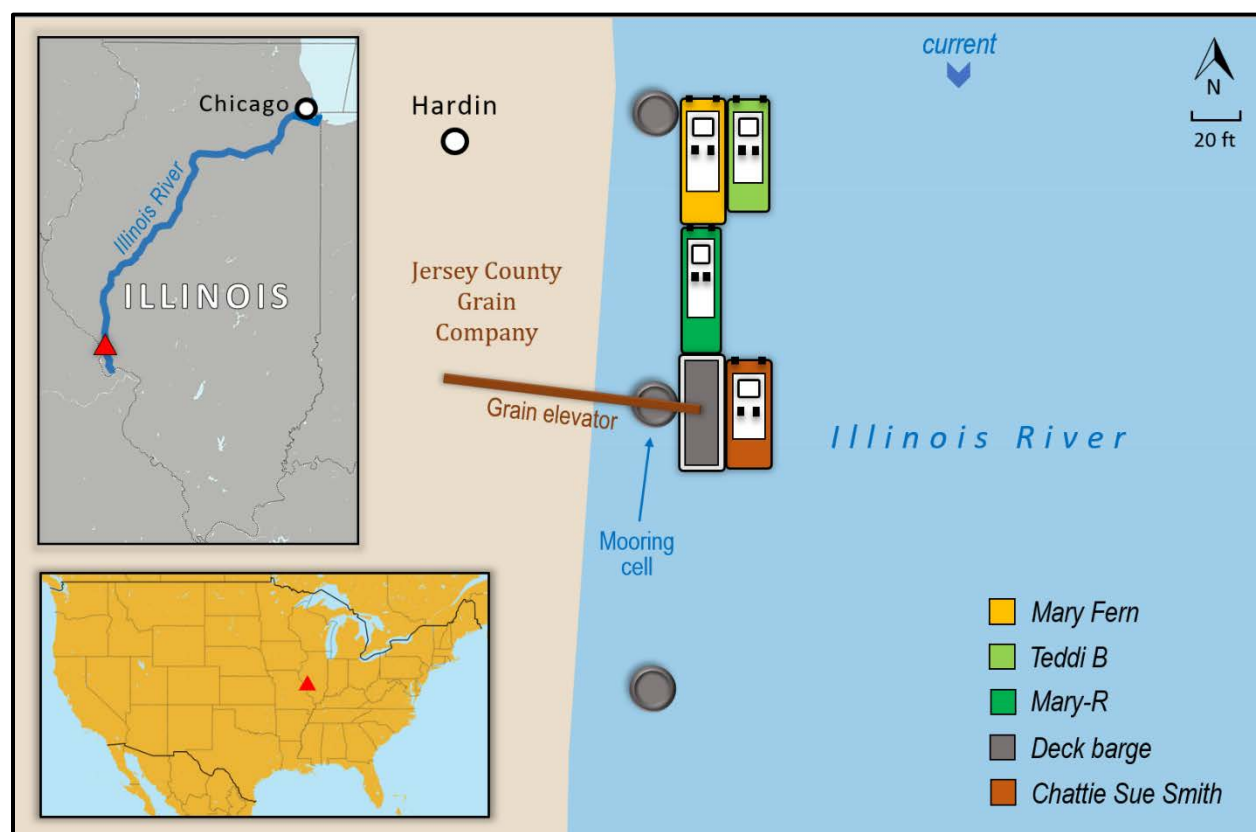
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Background

The 47-foot-long towing vessel *Chattie Sue Smith*, built in 1963, was purchased by Hex Stone, Inc. in 2011 and given its current name. In April 2019, Hex Stone acquired the 55-foot-long *Mary-R*, built in 1964; the 54-foot-long *Mary Fern*, built in 1978; and the 50-foot-long *Teddi B*, built in 1989. The *Teddi B* was moored with the other vessels on the day of the accident but did not sink. The towboats, all equipped with twin propellers, were moored with a 50-foot-long-by-18-foot-wide steel deck barge (also known as a dock barge or work flat) at the Jersey County Grain Company facility in Hardin, Illinois. The deck barge was subdivided into four compartments: a bow rake compartment, two full-width midbody compartments, and a stern rake compartment.

The *Chattie Sue Smith* had been operating as a fleeting vessel locally since January 2019, and the *Teddi B* was operated at the dock facility. The *Mary-R* and *Mary Fern* were not operational at the time of the sinking.

In early June 2019, the river gage at Hardin peaked at 40 feet (flood stage was 25 feet); on the day of the accident, it was recorded at 31 feet. The current was estimated at 1–2 miles per hour (mph).



Location where the three towing vessels and deck barge sank while moored on the Illinois River in Hardin, Illinois, as indicated by the red triangle. The mooring arrangement at the time of the accident is depicted with approximate positions. (Background source: Google Maps)

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Accident Events

On July 5, 2019, the four vessels and the deck barge were moored on the right descending bank of the Illinois River at mile 20.7, where the Jersey County Grain Company facility was located. The mooring arrangement consisted of, upriver to downriver, the *Mary Fern*; outboard of it, the *Teddi B*; off the *Mary Fern*'s stern was the *Mary-R*; astern of it was the unnamed barge; and outboard of the barge was the *Chattie Sue Smith*. Mooring lines and wires connected the towing vessels and barge together, with the *Mary Fern* and deck barge tied off to mooring cells with mooring lines. The cells, 16 feet in diameter, were filled with cement encased by steel sheet piles. There was no one at the facility or on any of the vessels at the time.

At 0654, the Hardin Fire Protection District was dispatched to the Jersey County Grain Company following a report of four towboats and a deck barge sinking in the Illinois River while moored at the facility. The initial report was made by a crewmember aboard a passing towing vessel who witnessed the vessels sinking. The crewmember alerted the nearby Hardin Bridge operator, who, in turn contacted the sheriff's office, which dispatched the fire department. Employees from Hex Stone arrived on scene before the fire department. The company's river operations manager notified the Coast Guard regarding the sinking as well as an environmental spill response company concerning diesel fuel in the water.



Mary Fern (capsized on left), *Chattie Sue Smith* (sunken in center), and *Teddi B* (upright on right) about 0800 on the morning of the sinking. (Source: Hardin Fire Protection District)

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When Hex Stone personnel and first responders from the Hardin Fire Protection District arrived on scene, the *Chattie Sue Smith* was laying on its port side, submerged in the water, and the *Mary Fern* was taking on water and laying against the *Teddi B*. About 0800, company employees boarded the *Teddi B*, started an engine, and maneuvered it away from the *Mary Fern* to prevent both vessels from possibly capsizing. Once both towboats were separated, the *Mary Fern* capsized and sank in approximately 26 feet of water, near the location of the sunken *Chattie Sue Smith*. Later that day, a surveyor arrived and reported the *Chattie Sue Smith* was laying on its port side, bow upstream, with only a portion of the wheelhouse visible above the surface of the water. The deck barge sank completely where it had been moored, and the *Mary-R* was partially submerged to the upper part of the wheelhouse and sitting upright on the river bottom upriver from the *Chattie Sue Smith*. The *Teddi B*, the only vessel that did not sink, transited away from the sinking site under its own power, and was secured at another docking site.

In the early afternoon, the spill response company arrived and began deploying containment booms around the vessels. The following afternoon, divers arrived on scene and secured as many oil tank vents on the sunken vessels as possible to contain pollution. Altogether, the *Chattie Sue Smith*, the *Mary Fern*, and the *Mary-R* had approximately 4,700 gallons of diesel fuel on board; approximately 2,800 gallons were released into the Illinois River, which was estimated to be mostly recovered.



In the foreground, the sunken *Chattie Sue Smith* on its side. The wheelhouse of the *Mary-R* appears just above the water's surface in the background.

The three sunken towing vessels were declared constructive total losses. During the capsizing and sinking of the towboats and deck barge, the mooring cell, which was also a support for the grain elevator, was damaged by the deck barge's mooring lines. Two sheet piles were pulled apart by approximately 3 feet at the top of the cell.

Additional Information

Between July 12 and 19, a salvage company recovered the *Chattie Sue Smith*, *Mary Fern*, *Mary-R*, and the deck barge that sank. An inspection for possible deficiencies that might have caused them to sink revealed no reported signs of water ingress from the three towboats. Aboard the barge, however, several small holes were found on the deck, the sides (about 6–12 inches from the bottom), and the bottom plating. An open watertight hatch (manhole) on the deck of the barge, which provided access to the midbody compartment for power cords and discharge hoses, was found during salvage operations. The barge was equipped with

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two electrically operated submersible bilge pumps powered from shore, one in each of the midbody compartments. The pumps had 2-inch discharge ports and were designed to be activated automatically by float switches. Both pumps were tested after the sinking for proper function: one pump was found to be inoperable. Closer inspection of the areas of the hole on the sides of the barge showed pitting and several areas that had been previously repaired with an epoxy-like product.



At left, water bubbles from the manhole on the top deck of the barge during salvage. At right, an annotated photo from the vessel company identifies holes on the side shell of the barge near the bottom plating. (Source: Coast Guard and Hex Stone)

The operating company did not have any information about the manufacturer, age, or maintenance records of the pump. There were no records of inspections of the towing vessels and the deck barge while docked at the facility.

Typically, the company had crews board the vessels in Hardin every 2–3 days. The last day any company employee had been on the barge and with the towing vessels was July 1, four days before the accident, when the owner of the company said he had been aboard the barge and pumped out water that had accumulated.

A review of the weather observations for the five days before the sinking indicated thunderstorms occurred every day except July 1, with a total of 0.78 inches of rain reported at the nearest weather station (St. Louis Airport) during the period.

Analysis

A post-salvage inspection of the deck barge revealed that there were several small holes on the deck that could have allowed rainwater to collect and enter the interior compartments. Additionally, holes found on the sides and on the bottom of the hull could have allowed river water to enter the barge. Based on a review of its condition, the holes likely had been present for a significant amount of time and were the source of barge flooding. The side and bottom holes would have allowed water to continuously flood the barge's compartments, which required the automatic bilge pumps to dewater the spaces at frequent intervals. Monitoring the frequency of the bilge pump operation and developing a trend of the volume of water being removed would have indicated the rate of water ingress and assisted in detecting hull leaks not easily visible.

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As found in this barge sinking, failure of one of the automatic submersible bilge pumps would have prevented constantly accumulating water from being removed from its compartment and resulted in the space flooding. If the barge began flooding in this manner, the barge's freeboard would have been reduced, thereby submerging other holes that were above the waterline in the side plating and resulting in an increased rate of flooding. Once the upriver rake of the barge became submerged in the estimated 1–2-mph current, flooding would have occurred through the open manhole, and the current would have forced it under water. Since the towboats were secured by wires and mooring lines to the deck barge, the flooding and subsequent sinking of the deck barge pulled three of the attached towboats under the surface and nearly the fourth vessel as well.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the sinking of the towing vessels *Chattie Sue Smith, Mary Fern, and Mary-R*, along with a deck barge, was the deteriorated condition of the barge and the infrequent monitoring of the vessels, which allowed the barge to flood and sink, ultimately pulling down the moored towing vessels.

Company Oversight of Inactive Vessels

To protect vessels and the environment, it is good marine practice for owners and operators to conduct regular oversight and maintenance of vessel and barges, even during lay-up periods. Oversight should include periodic testing and maintenance of dewatering equipment.

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Vessel Particulars

Vessel	<i>Chattie Sue Smith</i>	<i>Mary Fern</i>	<i>Mary-R</i>	<i>Deck Barge</i>
Owner/operator	Hex Stone, Inc.	Hex Stone Inc.	Hex Stone Inc.	Hex Stone Inc.
Port of registry	Louisiana, Missouri	St. Louis, Missouri	St. Louis, Missouri	N/A
Flag	United States	United States	United States	N/A
Type	Towing vessel	Towing vessel	Towing vessel	Deck barge
Year built	1963	1978	1964	N/A
Official number (US)	290816	586798	295245	N/A
IMO number	N/A	N/A	N/A	N/A
Classification society	N/A	N/A	N/A	N/A
Construction	Steel	Steel	Steel	Steel
Length	46.5 ft (14.2 m)	54 ft (16.5 m)	55.2 ft (16.8 m)	50 ft (15.2 m)
Draft	5.5 ft (1.7 m)	5.6 ft (1.7 m)	5.5 ft (1.7 m)	N/A
Beam/width	20 ft (6.1 m)	20 ft (6.1 m)	16 ft (4.9 m)	18 ft (5.5 m)
Tonnage	24 GRT	69 GRT	47 GRT	N/A
Engine power; manufacturer	2 x 425 hp (317 kW) Cummins KT19-M diesel	2 x 325 hp (242 kW) Cummins NT855 diesel	2 x 400 hp (298 kW) Cummins KT1150 diesel	N/A
Persons on board	0	0	0	0

NTSB investigators worked closely with our counterparts from Coast Guard Marine Safety Unit Upper Mississippi River throughout this investigation.

For more details about this accident, visit www.nts.gov and search for NTSB accident ID DCA19FM043.

Issued: June 30, 2020

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 of the *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 of the *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 of the *United States Code*, Section 1154(b).