



# National Transportation Safety Board

## Marine Accident Brief

### Allision of *Amy Frances* Tow with Natchez–Vidalia Highway 84 Bridge

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<b>Accident no.</b>	DCA16FM020
<b>Vessel names</b>	<i>Amy Frances</i> , MM-46
<b>Accident type</b>	Allision
<b>Location</b>	Lower Mississippi River at mile marker 363.3 at Natchez, Mississippi 31°33.6' N, 091°25.2' W
<b>Date</b>	January 21, 2016
<b>Time</b>	1247 central standard time (coordinated universal time – 6 hours)
<b>Injuries</b>	None
<b>Property damage</b>	>\$542,000 est.
<b>Environmental damage</b>	24,654 gallons of catalytic cracked clarified oil
<b>Weather</b>	Visibility 10 miles, winds south at 10 mph, air temperature 71°F
<b>Waterway information</b>	The Lower Mississippi River near mile marker 363.3 was under an extreme high-water safety advisory from the US Coast Guard Captain of the Port due to “hazardous conditions associated with strong currents, severe outdrafts, [and] missing/off-station aids to navigation and diving buoys.”

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On January 21, 2016, the towing vessel *Amy Frances* was pushing a flotilla of six barges downbound on the Lower Mississippi River near Natchez, Mississippi. At 1247, the port lead barge in the tow, MM-46, allided with the center pier of the Natchez–Vidalia Highway 84 Bridge. The allision breached a forward cargo tank on the barge, resulting in the release of 24,654 gallons of catalytic cracked clarified oil into the river.<sup>1</sup> The estimated damage exceeded \$542,000. There were no injuries in the accident.

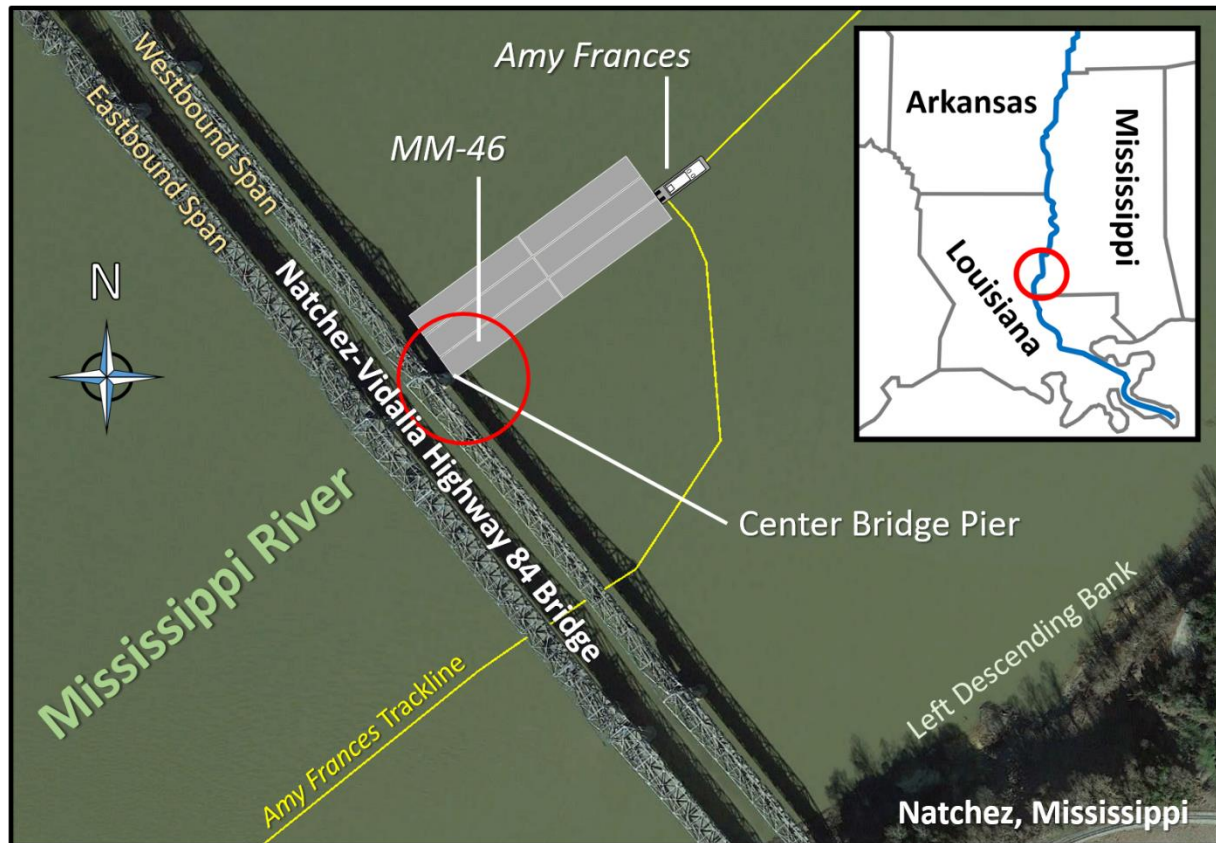


*Amy Francis* under way after the accident.

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<sup>1</sup> Catalytic cracked clarified oil, also known as slurry oil, is a heavy aromatic byproduct of an oil refinery’s fluid catalytic cracking process that forms a small part of global fuel oil supply. Generally, it is mixed into heavy fuel oil as a viscosity cutter.

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Satellite image of the accident site overlaid with a graphical depiction of *Amy Frances* tow and automatic identification system (AIS) track data. (Background by Google Earth Pro).

### Accident Background and Events

On the morning of January 15, 2016, the *Amy Frances* left Wood River, Illinois, bound for New Orleans, Louisiana, pushing four barges loaded with catalytic cracked clarified oil. On January 20, the tow stopped in Vicksburg, Mississippi, to pick up two additional unloaded barges. The tow of six barges was arranged three across and two deep. The total length of the tow, including the *Amy Frances*, was 735 feet and the total width was 162 feet. Barge *MM-46* held the forward port position.

Bridge equipment on the towing vessel included a GPS unit, a radar, a depth sounder, an automatic identification system (AIS), a rate of turn indicator, and a gyro compass. A computer-based electronic chart system (ECS) obtained information from this equipment and displayed course made good, heading, and speed over ground on a computer screen located in the wheelhouse.<sup>2</sup>

On the accident voyage, the crew of the *Amy Frances* totaled seven, including the captain and a pilot.<sup>3</sup> The vessel was operating on a two-watch system, with duty rotations occurring every six hours. The captain stood the 0600–1200 and 1800–0000 navigation watches, while the pilot stood the 0000–0600 and 1200–1800 watches. The pilot held a US Coast Guard merchant mariner credential

<sup>2</sup> The ECS also displayed other items of information, but only the data used in this brief are listed.

<sup>3</sup> *Pilot* is a term used aboard towing vessels on the Mississippi River and its tributaries for a person, other than the captain, who is navigating the vessel.

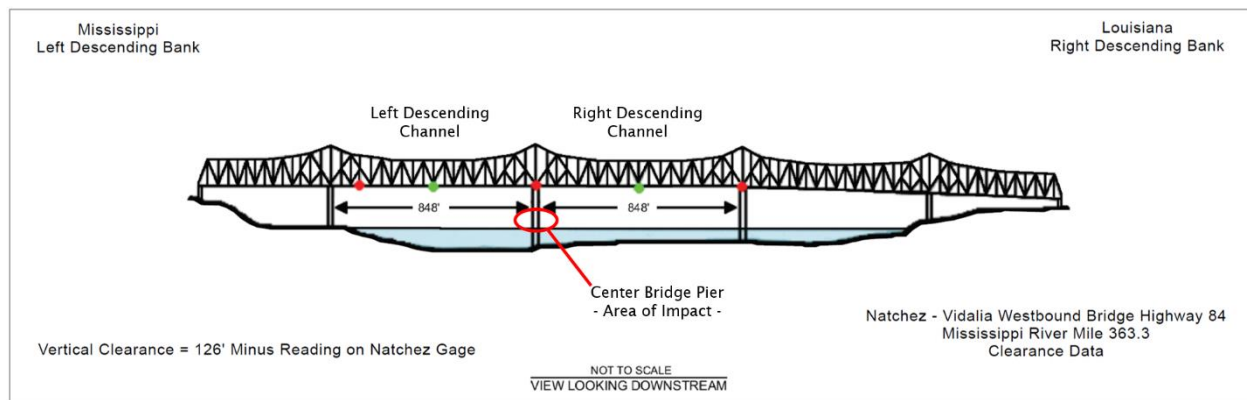
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as “master of towing vessels, Western Rivers.” (The Mississippi River and its tributaries are considered part of the Western Rivers as defined in Title 33 *Code of Federal Regulations* 83.03.)

At the time of the allision, a safety advisory from the Coast Guard Captain of the Port (COTP) was in effect warning mariners about the “extreme high-water” conditions on the Lower Mississippi River “due to hazardous conditions associated with strong currents, severe outdrafts, [and] missing/off-station aids to navigation and diving buoys.” The advisory further stated that “the COTP in concurrence with the Lower Mississippi River Committee recommends the following limits for tows transiting the area . . . when the Vicksburg, Mississippi Gauge is above 50 feet. Downbound: Wheelman are to have recent experience handling current conditions.”<sup>4</sup> At 0800 on the day of the accident, the reading at the US Army Corps of Engineers Vicksburg Gauge was 49.64 feet; flood stage for this gauge was 43 feet. The pilot told investigators that he had never transited through the accident area, downbound, when the river was above flood stage.

During the evening hours of January 20, the vessels’ owner/operator instructed the *Amy Frances*’s captain to moor for the night at Fairchilds Island Number 114, Mississippi, about 10.7 miles from the accident site. According to the pilot, this instruction was due to the high-water conditions necessitating a restriction on nighttime transits.

About 1100 on January 21, the pilot came to the wheelhouse of the *Amy Frances* to relieve the captain. The pilot told investigators that he and the captain discussed the upcoming transit of the tow through the Natchez–Vidalia Highway 84 Bridge, and it was decided that the pilot would stay to the left of the track line, away from the right descending bank, because the “eddy current was working harder than normal.” Staying to the left would keep him “out of the eddy current enough to be able to make the bridge with no problem.”



**Natchez–Vidalia Highway 84 Bridge. (Diagram by US Army Corps of Engineers)**

The Natchez–Vidalia Highway 84 Bridge has twin cantilever-style bridges that connect the cities of Natchez, Mississippi, and Vidalia, Louisiana. The upriver span is for westbound vehicular traffic and the downriver span for eastbound traffic. Both spans have six concrete piers—structures designed to support the spans—as pictured above. Three of the piers on each span form two main channels for vessels to navigate, the left descending channel and the right descending channel. The Army Corps of Engineers chart for the Lower Mississippi River lists the horizontal distance between the main channel piers as 848 feet, while the Coast Guard Light List states the distance

<sup>4</sup> The Lower Mississippi River Safety Advisory Committee is a group of 25 marine industry representatives who advise the Coast Guard on matters relating to navigation safety for the Lower Mississippi River.

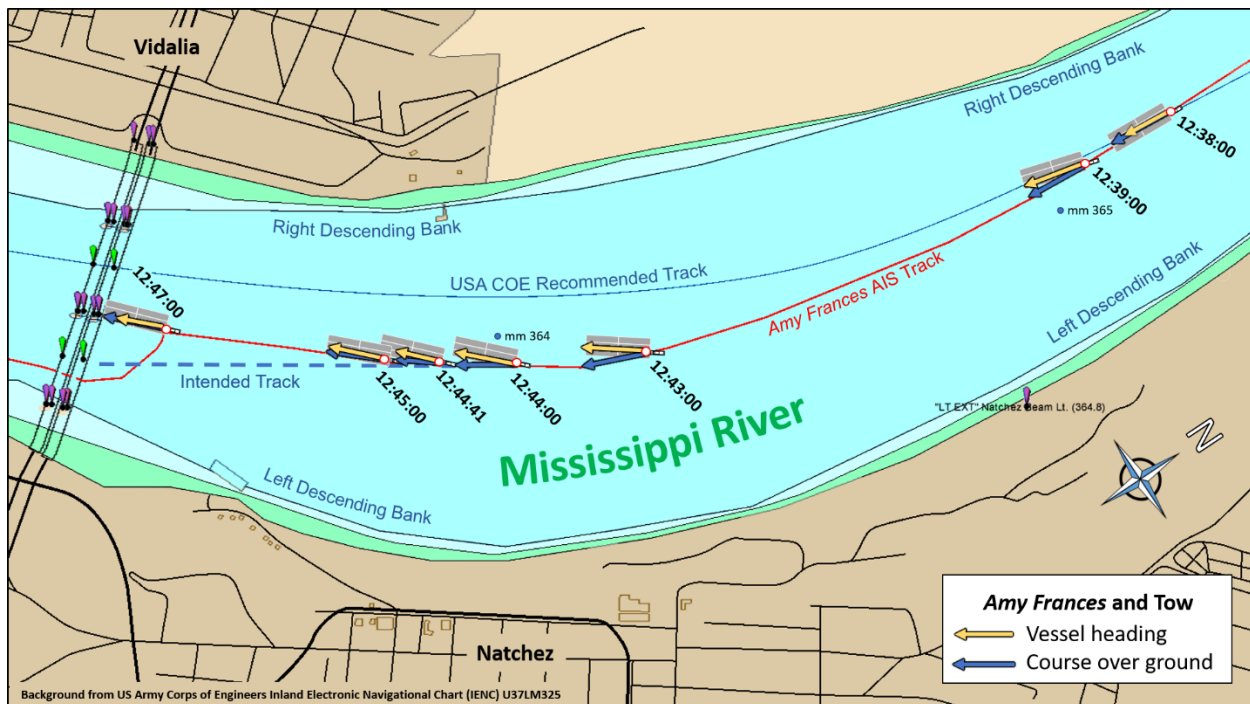
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as 785.8 feet. The planned track of the *Amy Frances*, as reviewed by investigators after the accident, was through the right descending channel—the channel toward the middle of the river.

According to AIS data, the *Amy Frances* got under way about 1136 from its mooring position near mile marker (mm) 374. The pilot had the conn, and the vessel proceeded downbound toward New Orleans. The captain was not in the wheelhouse.

Based on AIS data, at 1153 the *Amy Frances* and its tow were at mm 373 and making a speed of 7.8 mph. According to the vessel's ECS, at 1238 the *Amy Frances* was at mm 365.4, at a speed of 12.8 mph, steering 182 degrees and making about the same course made good.<sup>5</sup>

The pilot told investigators that, as the tow approached the bridge, he found that it was setting to the left, so he decided to take the left descending channel rather than the right descending channel as originally planned.



Per ECS, shortly after 1238 the vessel's heading began to shift to the right. By 1239, it was steering 196 degrees but still making good a course of 182 degrees. At 1243, as it passed mm 364.2, the *Amy Frances* was heading 228 degrees while making a course good of about 200 degrees—toward the left descending bank. At 1243:12, the vessel's heading remained the same but the course made good began coming to the right. At 1244:00, the speed was 12.9 mph, the heading was 236 degrees, and the course made good was 215 degrees. A steady course made good of 215 degrees would have, by ECS, carried the tow through the left descending channel. However, ECS showed the course made good continued to change to the right. Twenty-seven seconds later, at 1244:27, the vessel was still heading about 236 degrees. Since the course made

<sup>5</sup> The vessel's ECS was not used for the earlier times noted in the accident events because the recording given to investigators did not include vessel positions and speeds during that time.

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good continued changing to the right, ECS showed the tow would no longer pass through the left descending channel but would instead hit the left side of the center bridge pier.

Less than 15 seconds later, at 1244:41, the vessel's heading started changing to the left while the course made good continued to the right. About 0.6 mile from the bridge, the tow was heading for the middle of the center channel pier at a speed of 13.0 mph. At 1245, with the *Amy Frances* about 0.5 mile from the bridge, the vessel was heading 230 degrees and making good a course of about 224 degrees.<sup>6</sup> The tow was now headed toward the right-hand side of the center pier. About 1247, with the towing vessel backing full astern, the port side of barge *MM-46* struck the right side of the center pier at a speed of about 9.4 mph.<sup>7</sup>

Five of the six barges broke away from the *Amy Frances* following the allision, but they were quickly recovered with the assistance of other towing vessels in the area.



**Damaged port bow of barge *MM-46*. (Photo by US Coast Guard)**

## Analysis

At 1153, the *Amy Frances*'s course made good and heading were the same, which indicated that the vessel was making the course it was steering and was not being set to either side of its trackline. At 1239, the vessel was setting about 14 degrees to the left, which is consistent with the pilot's statement. At 1243, the vessel's set was 28 degrees to the left. Twelve seconds later, the vessel's course made good started coming right and, at 1244, the set had reduced to 21 degrees to the left. By 1245, the set had reduced to 6 degrees to the left. In the span of 2 minutes, the set had reduced 22 degrees while the vessel's heading had changed 2 degrees to the right. This brought

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<sup>6</sup> The bow of the tow was approximately 0.1 miles forward of the tug's bow (and closer to the bridge).

<sup>7</sup> a) The vessel was backing per the pilot's written statement; b) While the speed listed was from ECS, AIS showed a higher speed of impact of about 10.2 mph.

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the vessel's course made good from clearing the bridge piers of the left descending channel to hitting the center pier.

When investigators asked the pilot what the ECS showed him as he approached the bridge, he stated, "Whenever I first started my steer it showed I was steering good. It showed everything was coming around right." But then, he continued, "I don't sit there and look at the computer. I cannot drive the boat watching this." He further stated that he glanced at the ECS because "my speed is on there" and that he "looked at it a time or two and it was sliding and I could see it just stopped steering...and everything was sliding to port." He said, "When everything started sliding real fast I couldn't tell how fast it was sliding. I wasn't paying attention on how fast it was sliding. I was paying attention on what I was about to do, what was about to happen out the window."

As the *Amy Frances* and its tow approached the bridge, the pilot stated that he found the tow setting to the left so he decided to take the left descending channel and not the originally planned right descending channel. Investigators believe that if the captain or another pilot on the bridge was able to observe the ECS, they would have noticed the vessel's set had reduced from 28 degrees to 6 degrees and that the vessel would no longer pass safely through the left descending channel. Using this information, the pilot could have taken steps to effect a safe passage.

Investigators also noted that the owner/operator had a navigation program in the vessel operations procedure manual. The program stated that the master should consider—

contacting an assist tug to help navigate when conditions may endanger the safety of the tow, its cargo, or the vessel crew. Such conditions may include, but are not limited to, the following:

- a) Strong current;
- b) High winds;
- c) High or low river stages;
- d) Dangerous maneuvering;
- e) Bridge and Lock transits as deemed appropriate by the Master or Pilot.

The pilot told investigators he had never transited through the accident area, downbound, when the river was above flood stage. Yet, when investigators asked the pilot if he considered taking an assist tug for the bridge transit, he replied, "No. I never felt bad about it. I never had one doubt I couldn't get through there. I never doubted the boat in a minute."

The owner/operator's navigation program did not account for the pilot's experience during "high-river stages" nor did it mention the use of a second or additional pilot to assist during the conditions listed above. After the accident, the company provided investigators with a presentation of what they believed occurred during this accident and operational changes for future high-water transits. The company is considering adding "trigger points" for "requiring two pilots in the wheelhouse when approaching fixed structures during adverse conditions (i.e., high-water events.)"

## Probable Cause

The National Transportation Safety Board determines that the probable cause of the allision of the *Amy Frances* tow with the Natchez–Vidalia Highway 84 Bridge was the pilot's failure to properly compensate for the current in the vicinity of the bridge while proceeding downbound under high-water conditions, and the captain's failure to recognize the pilot's inexperience with these conditions and assist the pilot with the maneuver.

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### Vessel Particulars

Vessel	<i>Amy Frances</i>	<i>MM-46</i>
Owner / operator	Magnolia Marine Transport Co.	Magnolia Marine Transport Co.
Port of registry	New Orleans, Louisiana	New Orleans, Louisiana
Flag	United States	United States
Type	Towing vessel	Tank barge
Year built	1979	1992
Official number (US)	602459	988507
Construction	Steel	Steel
Length	140 ft (42.7 m)	297 ft (90.5 m)
Draft	9.6 ft (2.92 m)	9.6 ft (2.92 m)
Beam/width	38 ft (11.6 m)	54 ft (16.5 m)
Gross tonnage	491 gross tons	1,619 gross tons
Engine power; manufacturer	2 X 1900 hp (1417 kW) 16-645E6A EMD diesels	Unpowered
Persons on board	7 persons	0 persons

**NTSB investigators worked closely with our counterparts from Coast Guard Marine Safety Detachment Vicksburg throughout this investigation.**

For more details about this accident, visit [www.nts.gov](http://www.nts.gov) and search for NTSB accident ID DCA16FM020.

### Issued: May 15, 2017

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*, 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*, 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*, 1154(b).