



National Transportation Safety Board

Marine Accident Brief

Collision of *Crimson Gem* Tow with Bulk Carrier *Yangtze Ambition*

Accident no.	DCA16FM021
Vessel names	<i>Crimson Gem</i> tow and <i>Yangtze Ambition</i>
Accident type	Collision
Location	Lower Mississippi River, mile marker (mm) 117.1, Ama, Louisiana 29°56.5' N, 90°18.7' W
Date	January 28, 2016
Time	0430 central standard time (coordinated universal time – 6 hours)
Injuries	None
Property damage	\$575,000 est.
Environmental damage	None
Weather	Visibility 10 miles, winds north at 11.5 mph, air temperature 46°F, mostly cloudy
Waterway information	Downbound on the Mississippi River in the accident area, the river bends 67 degrees to the left, from east-southeast to northeast, and reduces in width from 700 to 550 yards. The US Army Corps of Engineers publishes a project depth for deep-draft ships of 45' up to Baton Rouge (mm 232.2). The current may have been as high as 6.7 mph.

On January 28, 2016, at 0430 local time, the uninspected towing vessel *Crimson Gem* was pushing 20 barges downbound during high-water conditions on the Lower Mississippi River in Ama, Louisiana, when two of its barges collided with the bulk carrier *Yangtze Ambition* docked at the bottom of a river bend. Damages to the vessel and the barges, including a third barge that made contact with the dock, totaled an estimated \$575,000. There was no injury or pollution.



Towing vessel *Crimson Gem* with the remaining barges following the collision.
(Photo by US Coast Guard)

Accident Events

On the day of the accident, the *Crimson Gem* was pushing 20 barges (16 containing corn and 4 containing alcohol) from St. Louis, Missouri, en route to the American River Transportation Company (ARTCO) Tulane fleet area at mile marker (mm) 117.1 in St. Rose, Louisiana. The barges were arranged four across and five deep, each 195 feet long and 35 feet wide. The entire tow (vessel and barges) was about 1,185 feet long and 140 feet wide.

*All distances in this report are statute miles.

NTSB/MAB-17/02

Note: This report was reissued on April 3, 2017, with corrections to page 7.

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Less than one-half mile before the *Crimson Gem*'s destination, the *Yangtze Ambition* was docked on the opposite bank at the Archer Daniels Midland (ADM) Grain Company facility at mm 117.6, in Ama, Louisiana, near the bottom of a 67-degree bend in the river.



Bulk carrier *Yangtze Ambition*. (Photo by Coast Guard)

At the time, the river stage measured 16.12 feet at the Carrollton gage, which was near flood stage, and the current may have been as high as 6.7 mph, according to data from the US Army Corps of Engineers.¹ The strong current was the result of not just the high water, but also the narrowing of the river, which reduces in width from 700 to 550 yards in the Ama bend.

While transiting at night through the bend at Ama with a following current, the pilot on the *Crimson Gem* had to meet two towing vessels traveling upriver, the *Dennis Fromenthal* without a tow and the *San Saba* pushing two barges.² After meeting them, he planned to stop his tow in time to berth at the ARTCO fleet area less than a mile away. Based on automatic identification system (AIS) data, at 04:23:32, the *Crimson Gem*, traveling 9.3 mph (speed over the ground), passed the *Dennis Fromenthal* on its port side in the bend at mm 118. The *San Saba* tow was less than one-half mile downriver on the port quarter of the *Dennis Fromenthal*.

After passing the *Dennis Fromenthal*, yet before meeting the *San Saba*, the pilot put the *Crimson Gem* engines astern to slow the tow in order to land at the terminal. By the time the *Crimson Gem* met the *San Saba*, the vessel's engines were full astern. At 04:26:58, the *Crimson Gem* passed the *San Saba*, again on its port side, in the bend at 0.8 mph, two-tenths of a mile from the *Yangtze Ambition*. The pilot told investigators that, as he attempted to maneuver through the bend, the current was pushing him sideways. "[I] should have started backing down earlier," he said. "I almost had the tow stopped [from sliding across the bend], but the current was too strong." Had his destination not been so close, the pilot added, he would not have backed down at all.

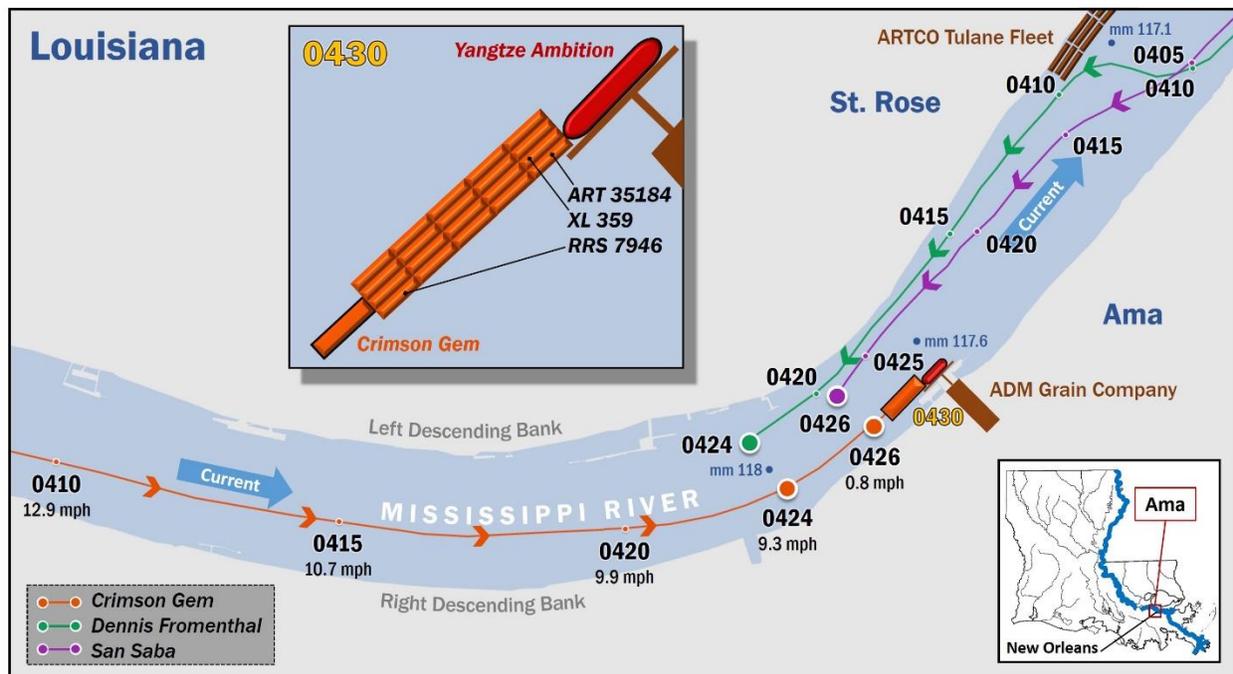
At 0430, the *Crimson Gem* tow collided with the *Yangtze Ambition* moored at the ADM Grain dock on the right descending bank in the river bend. The starboard two barges at the head of the tow were damaged when they made contact with the bulbous bow of the *Yangtze Ambition*. The barge on the starboard corner became wedged under the dock and broke free from the tow.

¹ The Carrollton gage established by the US Army Corps of Engineers at mm 102.8 on the Mississippi River measures the river's water height, or stage.

² A *pilot* in this capacity is also termed *mate* on inland/Western River waterways.

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The inboard starboard barge, though damaged in the collision, remained with the *Crimson Gem* tow. The two lead barges on the port side broke away from the tow and were later recovered by the Tulane fleet boat *MS Danielle*. Additionally, the aft-most barge on the starboard side of the tow was damaged when the aft portion of the tow swung into the dock in front of the *Yangtze Ambition*.



Based on automatic identification system data, the tracklines of the vessels *Crimson Gem*, *Dennis Fromenthal*, and *San Saba*, along with the position of the moored *Yangtze Ambition* in the river bend in Ama, Louisiana, leading up to the collision at 0430.

The *Yangtze Ambition* sustained a 12-inch-by-16-inch hole on the port side of the bulbous bow, costing an estimated \$25,000 to repair. On the barges, steel plates had to be replaced on the bows of the lead barges *ART 35184* and *XL 359* for an estimated \$150,000 each and on the stern of the aft barge *RRS 7946* for an estimated \$100,000.



Barge *ART 35184* wedged under the dock after the *Crimson Gem* tow collided with the bulk carrier *Yangtze Ambition*. (Photo by Coast Guard)

Collision of *Crimson Gem* Tow with Grain Carrier *Yangtze Ambition*

The *Crimson Gem* pilot held a Merchant Marine Credential as Master of Towing Vessels on the Western Rivers since 2005. He had been on board the *Crimson Gem* for one year and had operated line-haul tows on the Lower Mississippi River for 16 years.



Damaged starboard bow of barge XL 359 from the *Crimson Gem* tow. (Photo by Coast Guard)

away on the left descending bank from the accident site. Backing down in the current reduced his ability to control the tow.

The pilot would have preferred to have “flanked” the bend, as he told investigators. Flanking allows tows to pivot around the point of a bend, similar to how a large log might drift downriver. A vessel operator may decide to flank around a bend if the combined forward speed of the vessel and the current might otherwise push the tow onto the outside riverbank before the turn can be completed. Compared with steering around a bend, flanking requires more time to navigate

Accident Analysis

The *Crimson Gem* pilot told investigators that he should have backed down sooner than he did after passing the *Dennis Fromenthal*. By slowing down sooner, he would have better positioned the *Crimson Gem* tow to account for the slide effect of the current in the 67-degree bend. Consequently, he could have kept his vessel farther away from the right descending bank where the *Yangtze Ambition* was docked. The pilot also said he would have not backed down at all had it not been for his ARTCO Tulane fleet area destination, just 0.9 mile



The flanking maneuver the *Crimson Gem* pilot would have preferred to do while transiting through the bend to mitigate the risk of the swift current. Vessel proportion is for illustration only. (Background by National Geographic MapMaker Interactive)

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through relatively short stretches of the river (as the forward speed is slower) but reduces the risk of running aground. Flanking is possible only when the current pushes the vessel from astern and carries the vessel through the turn. As the *Crimson Gem* approached the bend in Ama, the river current was pushing the tow from astern at as much as 6.7 mph.

The *Mississippi River Crisis Action Plan*—a joint project of the marine industry, the Coast Guard, and the US Army Corps of Engineers—suggests using the flanking maneuver to mitigate the risk of a fast current in river bends: “Relative speed through the water can approach zero when southbound, making normal control of a vessel impossible. To continue to operate in high currents, the flanking maneuver was developed to use, rather than fight, the current to navigate around the many points on the river systems.” Despite having used the maneuver earlier during the voyage from St. Louis, the *Crimson Gem* pilot did not flank the bend in Ama because of the increased risk of collision stemming from the vessel traffic congestion and fleeting operations, along with having to meet both a towboat and a tow. The captain of the *Crimson Gem* called the bend in Ama the “worst part of the river.”

Recognizing the increased risk of accidents associated with high water, the Coast Guard, in collaboration with waterway stakeholders, developed guidelines for mitigating the risks on inland rivers. Additional guidance, the *Extreme Water Management Response Operations Plan*, states, “Extreme high-water conditions on the [Lower Mississippi River] increase the risk of vessel collisions with bridges, piers, and other infrastructure; collisions with vessels; and subsequent pollution and channel obstruction concerns.”³ The plan directed Sector New Orleans, among other efforts, to—

- coordinate with port stakeholders and, as required, employ [Captain of the Port] and Vessel Traffic Service (VTS) authority via Safety Zones and barge fleet/facility inspections to manage risk; and
- increase monitoring of river conditions and forecasts.

Also drawing on stakeholder input, Coast Guard Sector New Orleans published high- and low-water procedures to carry out the operations plan.⁴ The procedures called for the marine industry to “take action to reduce potential marine casualties during low- and high-water situations,” such as reducing their tow size to allow more control over the tow. The *Crimson Gem* operator was in compliance, towing only 20 barges instead of the usual 35.

When the Carrollton gage rises above 15 feet, as it did during the time of the collision, the procedures task the Coast Guard with “considering other marine traffic measures and restrictions after conferring with waterway partners.” The Coast Guard Captain of the Port for New Orleans, who is also the Commander for Coast Guard Sector New Orleans, issued a Marine Safety Information Bulletin to advise mariners of southbound vessels to “consider restricting to daylight transits only [between mm 233 and mm 90.5]” until the Carrollton gage dropped below 16 feet.⁵ The *Crimson Gem*, however, was under way at night when the accident occurred. The captain told investigators he had no concerns about operating during this time.

³ Published by Coast Guard Eighth District in February 2015 as a supplement to Appendix 31 to Annex C of the CCGDEIGHT OPLAN 9780-07.

⁴ *High and Low Water Procedures, Procedure No. WWM-015-02*, revised on May 11, 2015.

⁵ *High River Best Practices: MM 88 to MM 234 AHP LMR*, published by Coast Guard Sector New Orleans on January 15, 2016, as a correction to bulletin volume 16, issue 12.

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The Coast Guard and waterway stakeholders, including towing vessel operating companies, jointly planned strategies to address the risks associated with transiting river bends during periods of high water in order to balance preventing collisions, collisions, and groundings with facilitating maritime commerce. These plans involved extreme measures, including the Coast Guard Captain of the Port closing the river to traffic if the river level became too high.

Despite following the guideline to operate with a reduced number of barges, the *Crimson Gem* pilot could not keep his tow from making contact with the docked *Yangtze Ambition*. Several factors in the bend increased the risks of an accident occurring: strong currents associated with high water, reduced maneuverability of the vessel while navigating in the current, meeting two vessels head on, a vessel docked on the right descending bank, and the approach to a destination close at hand that required coming to a complete stop.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the collision of the *Crimson Gem* tow with the moored bulk carrier *Yangtze Ambition* was the *Crimson Gem* pilot's ineffective maneuvering for the prevailing current in a river bend.

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Vessel Particulars

Vessel	<i>Crimson Gem</i>	<i>Yangtze Ambition</i>	<i>ART 35184</i>	<i>RRS 7946</i>	<i>XL 359</i>
Owner/operator	ARTCO	Tianjin CNB Sea Passion Co., Ltd./Yangtze Navigation (Hong Kong) Co., Ltd.	ARTCO	ARTCO	ARTCO
Port of registry	St. Louis, Missouri	Hong Kong, China	St. Louis, Missouri	St. Louis, Missouri	St. Louis, Missouri
Flag	United States	Hong Kong	United States	United States	United States
Type	Towing Vessel	Bulk Carrier	Barge	Barge	Barge
Year built	1974	2011	2010	1979	1981
Official number (US)	557019	NA	1225269	611592	631807
IMO number	NA	9583847	NA	NA	NA
Construction	Steel	Steel	Steel	Steel	Steel
Length	195 ft (59.4 m)	590.2 ft (180 m)	195 ft (59.4 m)	195 ft (59.4 m)	195 ft (59.4 m)
Draft	10 ft (3 m)	24.3 ft (7.4 m)	12.6 ft (3.8 m)	10.6 ft (3.2 m)	10.6 ft (3.2 m)
Beam/width	54 ft (16.5 m)	93.3 ft (28.44 m)	35 ft (10.7 m)	35 ft (10.7 m)	35 ft (10.7 m)
Gross and/or ITC tonnage	1,166 gross tons	20,969 gross tons	745 gross tons	694 gross tons	700 gross tons
Engine power; manufacturer	9000 hp (6711 kW)	8689 hp (6479 kW); Diesel Direct	NA	NA	NA
Persons on board	10	22	0	0	0

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 DCA16FM021.

Issued: January 5, 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).