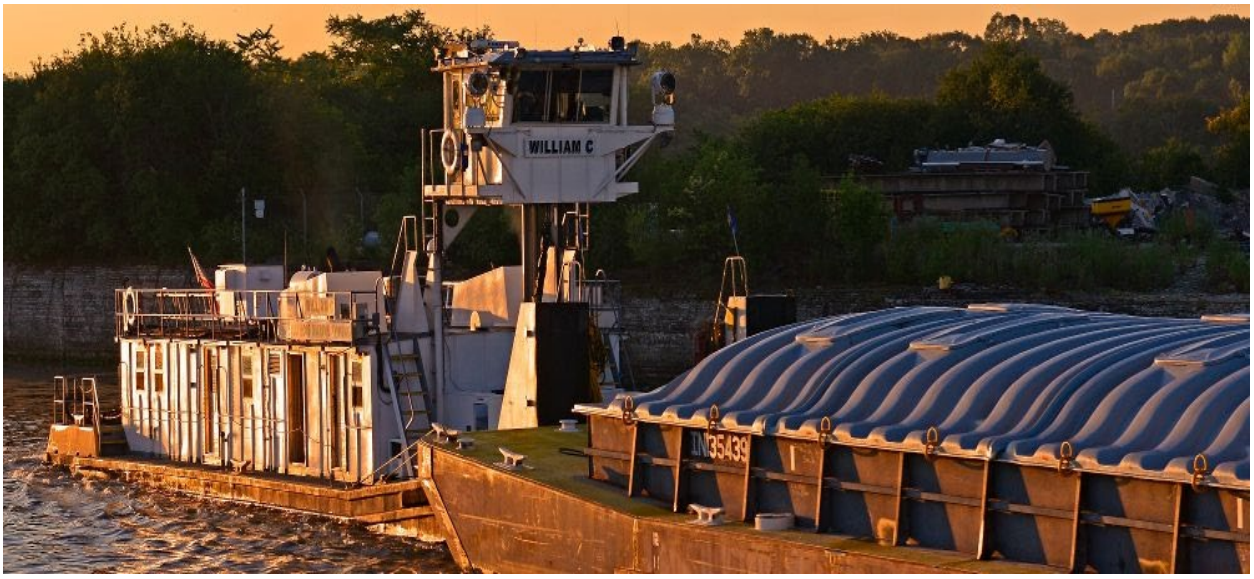
National Transportation Safety Board

Marine Accident Brief

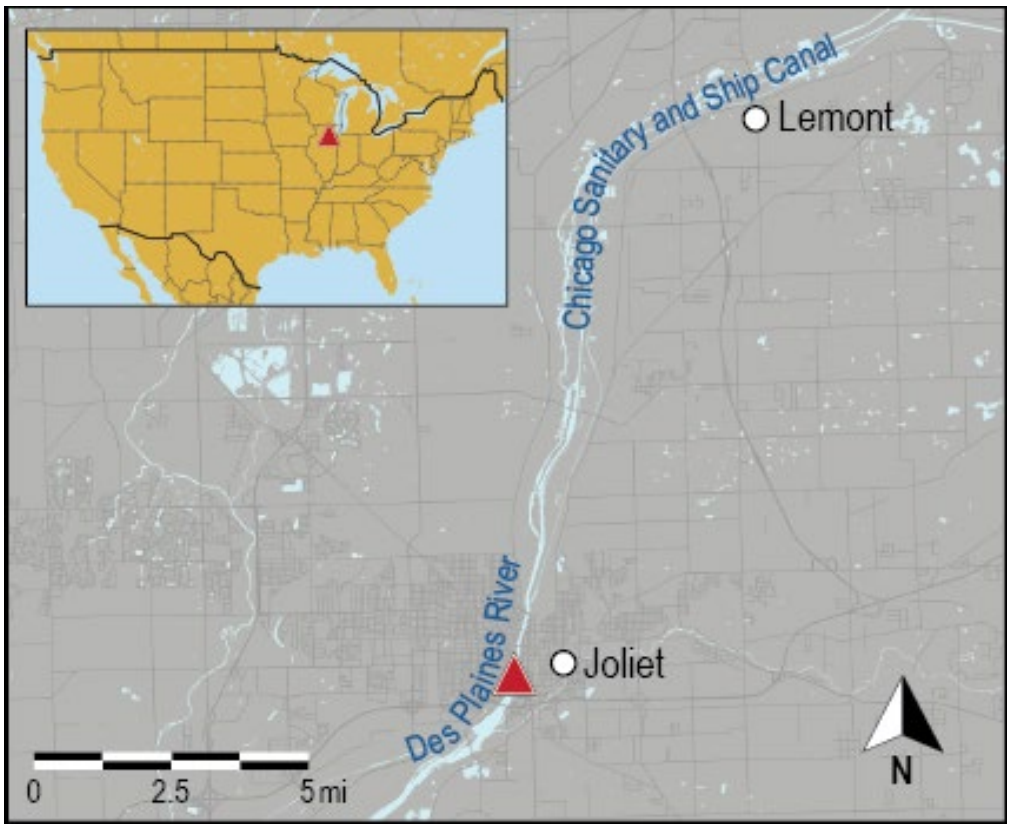
Contact of *William C* Tow with Rock Island Railroad Bridge Protection Cell

Accident type	Contact	**No.** DCA20FM010
Vessel name	*William C*	
Location	Des Plaines River, mile 287.6, Joliet, Illinois 41°31.13' N, 88°05.14' W	
Date	January 1, 2020	
Time	0032 central standard time (coordinated universal time – 6 hours)	
Injuries	None	
Property damage	$500,000 est.	
Environmental damage	None	
Weather	Clear, visibility 10 miles, winds west at 5.1 mph, air temperature 29°F, water temperature 33°F	
Waterway information	The Chicago Sanitary and Ship Canal is a waterway linking the south branch of the Chicago River with the Des Plaines River at Lockport, Illinois. The canal is 30 miles long and has a minimum width of 160 feet and a minimum depth of 9 feet. The Des Plaines River is a 133-mile-long river that flows southwest from Southern Wisconsin to Northern Illinois. The river is part of the Illinois Waterway, which connects the Great Lakes to the Mississippi River.	

At 0032 local time on January 1, 2020, the towing vessel *William C* was pushing a tow of six loaded hopper barges on the Des Plaines River, near Joliet, Illinois, when the tow's two forward barges struck a protection cell for the Rock Island Railroad Bridge at mile 287.6. Several tow lines broke, and two barges sustained minor damage. The bridge ceased operations for 10 days, and damages to the bridge's protection cell were estimated to be greater than $500,000. No injuries or pollution were reported.



Preaccident image of the *William C*. (Source: US Coast Guard)



Location where the *William C* contacted the Rock Island Railroad Bridge's protection cell, as indicated by the red triangle. (Background source: Google Maps)

Background

Owned by Illinois Marine Towing and operated by Inland Rivers Corporation, the 76.5-foot towing vessel *William C* was built in 1967 in Grafton, Illinois, to serve within the Illinois Waterway. The vessel was previously named the *John Alexia* and owned by Joliet Harbor Services. The vessel was powered by two diesel engines, each producing 600 horsepower and driving one propeller (two propellers total). The pilot house on the vessel could be hydraulically raised to maintain forward visibility over barges in a tow and lowered to allow the vessel to transit through low bridges.

The Rock Island Railroad Bridge, located at mile 287.6 of the Des Plaines River, was a three-span, through-truss lift bridge built in 1932 and owned by CSX Transportation. The 557-foot-long bridge spanned the river at a 45-degree angle from the east riverbank (left descending) to the west riverbank (right descending).[1] The lift bridge was normally left in the open position and only closed to allow trains to cross.

[1] The inland towing industry refers to the shorelines of western rivers as the left and right banks when traveling (facing) downstream. The left bank is called the *left descending bank*, and the right bank is called the *right descending bank*.

View looking downriver at the Rock Island Railroad Bridge. (Source: http://industrialscenery.blogspot.com/)

To protect the Rock Island Railroad Bridge from a potential strike by a vessel on the river, there were four concrete protection cells with floating fenders connected to a pier placed in front of and along the side of the structure and foundation to absorb and/or deflect the force of a vessel coming into contact with them. To assist with nighttime navigation, the center of the channel under the open bridge was marked with a green light, and each protection cell, pier, and support was marked with a red light. The accident pilot told investigators that on the night of the casualty, all the navigation lights were operating properly.

Accident Events

The *William C* departed the Illinois Marine Towing Fleet facility located at mile 299 on the Chicago Sanitary and Ship Canal—which connects with the Des Plaines River—in Lemont, Illinois, at 2005 on December 31, 2019, with a crew of six, including a captain, pilot, and four deckhands.[2] The pilot, who had begun his 12-hour watch at 1800 (with two of the deckhands), was at the helm. (The captain and other two deckhands stood watch from 0600–1800.) Prior to starting the watch, the pilot filled out the vessel's pre-sail and voyage plans and listed all of the systems as operating in satisfactory condition and noted the conditions of the tow as well as the weather.

The *William C* was pushing six open hopper barges: five of the barges were carrying coal, and one was carrying scrap metal. The tow was arranged two barges wide and three long; the total length of the towing vessel and barge tow was about 662 feet, the width was 70 feet, and the deepest draft was about 9 feet. The tow proceeded downriver (south) with the current en route to the Illinois Marine Towing Fleet facility at mile 280 of the Des Plaines River, in Channahon,

[2] *Pilot* is a term used aboard towing vessels on inland waterways for a person, other than the captain, who navigates the vessel.

Illinois. According to the pilot, the weather was good, with 10 miles of visibility and winds from the west at 5 miles per hour (mph), and the current was 3 mph.

On January 1, 2020, about 0020, the tow was under the Cass Street Bridge at mile 288.1 of the Des Plaines River, and the pilot had begun to line up the tow to go through the Jefferson Street Bridge at mile 287.9. Both bridges were 150-feet-wide drawbridges that were normally in the closed position but could open upon request to allow maritime traffic to pass.

On the day of the casualty, the flow rate reported by the US Army Corps of Engineers from the Ruby Street Bridge at mile 288.7, located north of the Cass Street Bridge, was 6,500 cubic feet per second (cfs). Under the Mississippi River and Tributaries Waterways Action Plan 2020—which is developed and implemented by the US Coast Guard, the Corps, and river industry representatives to coordinate and manage transportation within the inland maritime transportation system—this flow rate was considered a "very high flow" rate but did not require the operator of a tow to take any action to mitigate the risk of the current. According to mariners in the area, the current through the Cass Street Bridge, Jefferson Street Bridge, and the Rock Island Railroad Bridge tended to push downbound traffic to the left descending bank. The pilot was aware of the condition of the current but stated that he was comfortable with it.

The pilot said that as he attempted to line up the tow at a speed of 5 mph to pass through the Jefferson Street Bridge, he realized that he had turned the tow too far to port toward the left descending bank and to counter this action, turned the rudders to starboard. The vessel moved to starboard, toward the center of the channel, but when the pilot returned the rudders to midships, the vessel moved to port again. Since the tow was about 200 feet away from the bridge, the pilot maintained the course as it passed through the bridge.

Bridges through which the *William C*'s tow transited. (Background source: Google Earth)

After the Jefferson Street Bridge, the waterway had a slight bend to the west before the Rock Island Railroad Bridge's northeast protection cell about1,200 feet ahead. The pilot stated that he turned the rudders to starboard again to bring the bow over to starboard to line up in the channel. The vessel did not respond and continued toward the left descending bank. Since the tow was

arranged with fewer than three barges across, company policy did not require a deckhand to stand a watch on the bow of the lead barge to assist with maneuvering the vessel, so the other two crewmembers on watch with the pilot were inside the vessel galley as it approached the railroad bridge.

Realizing the likelihood of impact, the pilot sounded the general alarm and switched both engines into full reverse to slow the approach of the vessel toward the railroad bridge. The two crewmembers on watch came to the wheelhouse. According to the vessel's automatic identification system data, the tow started to slow down but did not stop completely; the pilot stated the vessel could not overcome the current. At 0025, the two forward barges, *INO85100* and *INO85226*, struck the northeast protection cell for the bridge. The protection cell was pushed into the adjacent floating fenders. Two wires holding the barges together broke, but the tow did not break apart.

The pilot notified the Coast Guard of the incident and moved the tow along the bank of the river past the bridge and remained there to evaluate the condition of the barges. The tow proceeded to the Illinois Marine Towing Fleet facility after the crew determined that the damage to the barges was minimal and the steel wires holding the barges were replaced. The bridge was closed for 10 days pending a damage survey.

Additional Information

The damage survey of the *William C* and six barges following the accident found a one-inch-deep inset on the port corner of the rake on the barge *INO85100*, which was the starboard lead barge. In addition, there was a two-inch indent on the starboard corner rake of the barge *INO85226*, which was the port lead barge. A number of steel tow wires that were holding the tow together frayed, and two snapped.

On January 10, 2020, a damage survey was conducted on the Rock Island Railroad Bridge to determine the extent of the damage to the protection cell and floating fenders. The damage survey found cracks and minor spalls across the cap (or top) of the protection cell, and the steel sheeting from the cap was separated in many locations. The cell had shifted 18 inches back (toward the bridge) from its original position. The walkway was bent, and minor damage was discovered on the fender.

Left: Northeast protection cell for Rock Island Railroad Bridge. Right: View from across the river of damaged protection cell with impact location circled. (Source: CSX Transportation)

The pilot stated that he had been sailing on towing vessels since 1994 and had sailed onboard the *William C* for two and a half years as the pilot. He also stated that he had sailed on the Chicago Sanitary and Ship Canal and the Des Plaines River many times since 2005 with no prior incidents.

The pilot told investigators that he had slept well the past few days prior to the accident. He also told investigators that he had been diagnosed with sleep apnea, and as a result, he used a Continuous Positive Air Pressure (CPAP) machine when sleeping and he had a medical wavier from the Coast Guard allowing him to sail as a licensed mariner with this condition. The CPAP machine's sleep log data showed that the pilot had maintained a good sleep schedule in the days prior to the casualty. In addition, the pilot and crewmembers on watch at the time of the casualty each took a postaccident drug and alcohol test, as required by the Coast Guard, with negative results.

The Mississippi River and Tributaries Waterway Action Plan 2020 provides vessel operators with action to take when high-flow conditions are present for each designated zone of the Illinois Waterway. For zones 13 and 14 of the Illinois Waterway, which include river miles 286 to 333.4, "normal operations" are defined as a flow below 1,000 cfs, "high flow" as below 5,000 cfs, and "very high flow" as above 5,000 cfs. When the river flow is at or exceeds 7,200 cfs, a helper boat is recommended for vessels transiting south through the bridges in the Joliet area (including the Cass Street and Jefferson Street Bridges and the Rock Island Railroad Bridge). If the river flow is at or exceeds 10,000 cfs in zones 13 and 14, all vessel traffic is halted in that portion of the canal system.

Analysis

The river flow at the time of the accident (6,500 cfs) was very high, but the Waterways Action Plan did not require risk mitigation measures, and the pilot stated that he was comfortable with maneuvering the tow in the 3 mph following current. The pilot controlled the *William C* tow without issue from the Illinois Marine Towing Fleet facility at mile 299, traveling with the current at a speed of 5 mph over ground—approximately 2 mph over the speed of the river—in order to maintain steering control.

At the time the tow was passing through the Cass Street Bridge and approaching the Jefferson Street Bridge, the following current in the bend would have been impacting the vessel's starboard quarter, pushing the tow over to port and the left descending bank. When the pilot approached the Jefferson Street Bridge, he realized that he had oversteered to port, so he moved the rudders to maneuver the tow to starboard to line up the vessel with the center of the bridge. Once the pilot believed the vessel was lined up, he returned the rudders to midships, but the current pushed the vessel back to port. Since the bow of the tow was already approaching the Jefferson Street Bridge, the pilot continued his course until the *William C* had passed the bridge.

Once the vessel had passed through the bridge, there was only about 1,200 feet for the pilot to maneuver the approximately 662-foot-long tow back to the center of the channel before reaching the Rock Island Railroad Bridge protection cell near the left descending bank. The pilot attempted to move the tow to starboard, but, since the following current was pushing against the tow, it continued toward the left descending bank. When the pilot determined there was not enough time to move the vessel in order to avoid striking the bridge, he reversed both engines to slow the vessel, which reduced the force of the impact but did not prevent the barges from hitting the bridge's protection cell.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the contact with the Rock Island Railroad Bridge protection cell by the *William C* and tow was the pilot's inability to correct the tow's position after completing the transit through the previous bridge, in part due to the higher-than-average current speed.

Vessel Particulars

Vessel	*William C.*	*INO 85226*	*INO 85100*
Owner/operator	Inland River Corp Illinois Marine Towing	Ingram Barge Company LLC	Ingram Barge Company LLC
Port of registry	Lemont, Illinois	Lemont, Illinois	Lemont, Illinois
Flag	United States	United States	United States
Type	Towing Vessel	Open Hopper Barge	Open Hopper Barge
Year built	1968	2008	2008
Official/IMO number	517882	1218226	1214035
Classification Society	ABS	N/A	N/A
Construction	Steel	Steel	Steel
Length	76.5 ft (23.3 m)	195 ft (59.4 m)	195 ft (59.4 m)
Beam/width	24 ft (7.3 m)	35 ft (10.7 m)	35 ft (10.7 m)
Draft	7.5 ft (2.3 m)	9 ft (2.7 m)	9 ft (2.7 m)
Tonnage	143 GRT	1,300 GRT	1,300 GRT
Engine power; manufacturer	Two Cummins KTA19-M3 600 hp (447.4 kW) diesel engines	N/A	N/A
Persons on board	6	0	0

NTSB investigators worked closely with our counterparts from Coast Guard Marine Safety Unit Chicago, Illinois, throughout this investigation.

For more details about this accident, visit www.ntsb.gov and search for NTSB accident ID DCA20FM010.

Issued: November 17, 2020