National Transportation Safety Board
Marine Accident Brief
Allision of the *Dale A. Heller* Tow with Marseilles Dam

Accident no.	DCA13NM017
Vessel name	*Dale A. Heller*
Accident type	Allision
Location	Illinois River, Mile Marker 247, Marseilles, Illinois 41°19.394′ N, 088°42.507′ W
Date	April 18, 2013
Time	1740 central daylight time (coordinated universal time – 5 hours)
Injuries	None
Damage	Barges: $3,767,000; Dam: $50 million
Environmental damage	Flooding damage to homes, businesses, and other property in the area
Weather	Heavy rainfall in the days preceding the accident led to high water and strong currents on the Illinois River
Waterway information	The Illinois River extends 333 miles from its confluence with the Mississippi River at Grafton, Illinois, to Lake Michigan at Chicago and Calumet Harbors, Illinois

On April 18, 2013, about 1740 local time, the uninspected towing vessel *Dale A. Heller* was downbound on the Illinois River pushing a 14-barge tow and attempting to enter the Marseilles Canal, adjacent to the Marseilles Dam, when it encountered a strong cross current. Despite the assistance of three additional towing vessels, the *Dale A. Heller* was unable to get the tow past the dam and into the safety of the canal. Several barges broke away, struck and damaged the dam's gates, and then sank. In addition, the accident likely exacerbated rain-related flooding in the nearby city of Marseilles, Illinois. No one was injured in the allision; however, the damage to the barges and the dam totaled nearly $54 million.


The towing vessel *Dale A. Heller* under way. (Photo by Jeff L. Yates)

Allision of the *Dale A. Heller* Tow with Marseilles Dam

The Marseilles Lock and Dam complex is located on the Illinois River between mile markers 245.5 and 247. The dam spans from the river's north bank to Bells Island. The lock is located about a mile and a half downstream (to the west) and is accessed via the Marseilles Canal, located between Bells Island and the river's south bank. The approach to the canal is separated from the dam by a line of five concrete pilings.

View of the Marseilles Lock (on the left, circled in red) and Dam (on the right, circled in blue). (Background by Google Earth) Inset in the image is the city of Marseille's location on an outline of the United States; the city is located about 80 miles southwest of Chicago, Illinois.
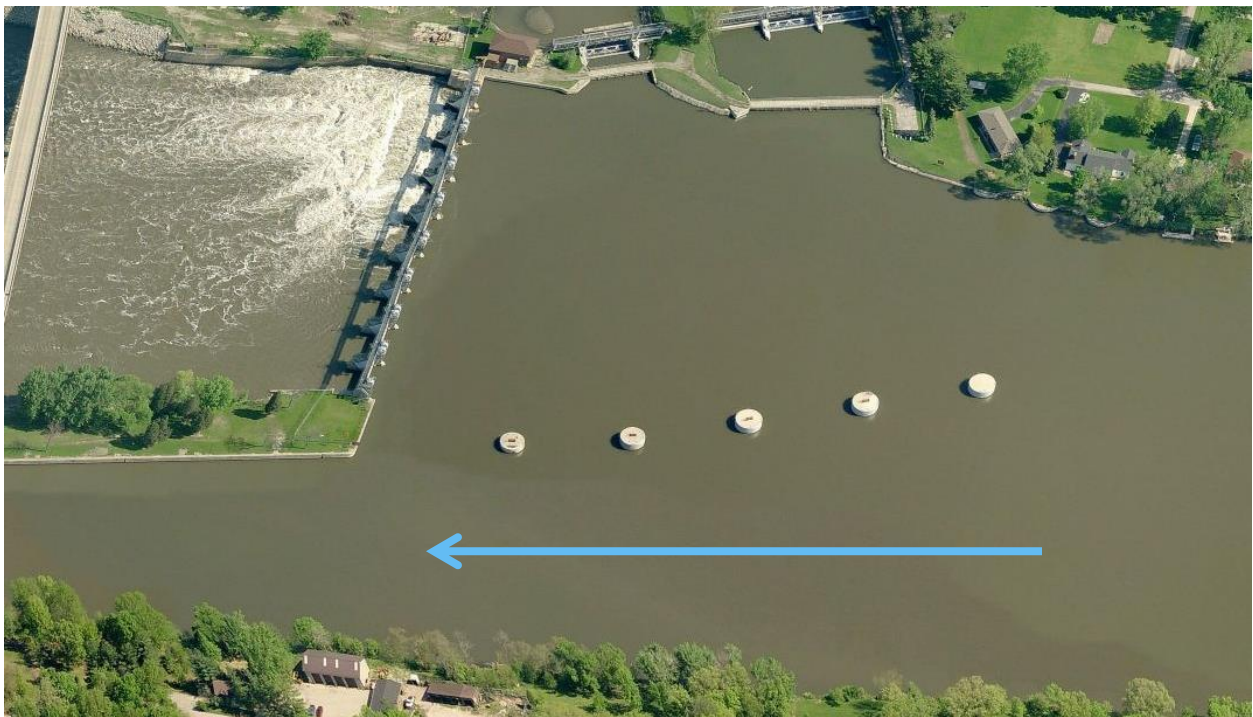
The allision site at the Marseilles Dam. The five protective concrete pilings separate the dam and the approach to the Marseilles Canal. The overlaid blue arrow shows the intended path of the *Dale A. Heller* tow into the canal. (Background by Google Earth)

The Marseilles Dam is a fixed, gated-concrete, gravity dam. The dam is 598.5 feet long with eight submersible Tainter gates (60 feet wide by 16 feet high). The gates were remotely controlled by the US Army Corps of Engineers (the Corps) lockmaster at the Marseilles Lock control station. Each gate could be individually raised from a fully closed position (no water passing through) to fully open, at which point the bottom of the gate would be vertically raised 9 feet from the closed position. The amount of water flowing through the dam would be

communicated to mariners in the following way: If all eight gates were open 3 feet, the lockmaster would say that 24 feet of gate was open (8 times 3 feet). When fully open, the Marseilles Dam would have 72 feet of open gate. Based on how much water the lockmaster was allowing to go through the dam, vessel operators could estimate the amount of cross current in the approach to the Marseilles Canal (the more water through the dam, the stronger the cross current).

During the week of April 15–19, 2013, large amounts of rain fell across central and southeast Illinois due to a slow-moving storm system. Rainfall during this time totaled between 5 and 7 inches along and west of the Illinois River. Most of the rain fell in a relatively short time period, from Wednesday, April 17 through Thursday, April 18. Because of already wet soil conditions, the excessive rainfall led to widespread flooding and nearly every river in the area exceeded flood stage. The Illinois River experienced record flooding on April 18.

The *Dale A. Heller* arrived above and east of the Marseilles Dam on April 17 about 0710. The towing vessel was pushing 14 barges; 13 carried various bulk cargo, and one barge was empty. That morning, the Marseilles Dam had 22.5 feet of open gate. The river was rising and additional rain was forecasted, so the *Dale A. Heller* held up about 0.75 mile above the dam to wait for better conditions. Several hours later, about 2033 on April 17, another towing vessel, the *Loyd Murphy*, was pushing 15 barges upriver and decided to hold up alongside the *Dale A. Heller* because of the difficult river conditions. While the two vessels waited, a large amount of rain caused a rapid rise in the river. The next day, April 18, both vessels began having trouble holding their positions because of the increasing current, and the captains were concerned as the river was expected to continue to rise. A nearby mooring was located to hold the *Loyd Murphy*'s tow, but there was not enough room for both tows. By midafternoon, the lockmaster had 66 feet of open gate on the dam, and the *Dale A. Heller* tow was experiencing increased difficulty holding its position.

About the same time, 1400 on April 18, the River Industry Action Committee and Illinois River Carriers Association held a conference call to discuss the deteriorating river conditions from the heavy rainfall. The call included personnel from the Coast Guard, the Corps, and other industry stakeholders. During the call, the group was notified of the developing emergency situation involving the *Dale A. Heller* tow. No immediate location was available to tie up the tow, and the water levels were expected to rise further still.

After discussing different options, the group decided to move the *Dale A. Heller* tow west into the Marseilles Canal, as it would provide a safe haven from the rough waters. However, the group was concerned about outdraft[1] at the approach to the canal caused by heavy water flow through the Marseilles Dam. According to the Coast Guard representative on the conference call, to mitigate the risk involved with the outdraft, the group decided that the towing vessel *Loyd Murphy* and two Corps towing vessels, the *City of Ottawa* and the *Creve Coeur*, would assist the *Dale A. Heller* on the approach to the canal. The lockmaster said that he could temporarily reduce the water flow at the dam and proposed closing 16 feet of gate as the *Dale A. Heller* tow

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[1] An outdraft is a current that moves across a lock or channel entrance toward a dam, and is caused by water flowing through the dam.

moved toward the canal. That setting would be maintained for the shortest time possible to reduce the risk of flooding to the city of Marseilles. Closing 16 feet of gate would have resulted in the dam having 50 feet of gate open.

A number of parties on the conference call misunderstood the lockmaster and believed that only 16 feet of gate would be open. This information was also conveyed to the towing vessel captains. The *Dale A. Heller* captain later told investigators that he would not have attempted the move into the Marseilles Canal had he known that the dam had more than 16 feet of open gate (and that, in fact, 50 feet of gate was open).

About 1530, the captains of the *Dale A. Heller*, *Loyd Murphy*, *Cody Boyd* (another towing vessel that later held the *Loyd Murphy*'s tow at the mooring), and the *City of Ottawa* held a captains' meeting on board the *City of Ottawa* to discuss the plan. About 1700, after securing the *Loyd Murphy*'s tow to the nearby mooring, the vessel crews began assisting the *Dale A. Heller* tow in getting under way. The *Creve Coeur* was positioned on the forward starboard side, perpendicularly to the direction of the tow; the *Loyd Murphy* on the starboard quarter, also perpendicularly; the *City of Ottawa* at the head; and the *Dale A. Heller* at the aft end. A Corps crane supervisor was on board the *Loyd Murphy* to provide a direct communications link to the lockmaster.
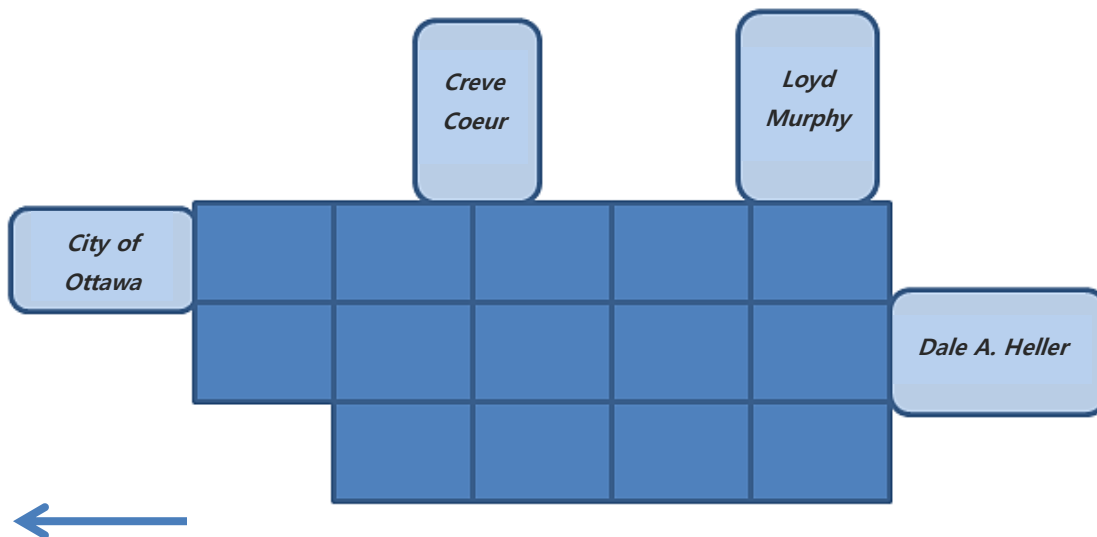

Diagram showing the approximate positioning of the four towing vessels and the 14 barges, as the vessel crews attempted to move the *Dale A. Heller* tow into the Marseilles Canal.

About 1703, the lockmaster began closing the gates from 66 feet open to 50 feet open. About 1718, as the *Dale A. Heller* and the assisting vessels were moving the tow toward the canal, the Corps crane supervisor on board the *Loyd Murphy* noticed that the water level had risen quickly and was in danger of breaching the levee and flooding the city of Marseilles. He discussed this with the *Loyd Murphy* captain and they agreed that the gates should be opened back up by 8 feet (to 58 feet open), and communicated this to the other vessel crews. However, instead of following through on that agreement, about 1720, the lockmaster began opening the gates to their original position of 66 feet open.

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About 1733, as the head of the tow entered the Marseilles Canal, the outdraft at the dam began pulling the tow toward the dam. The Corps crane supervisor called the lockmaster and directed him to close all gates, but it was too late. About 1734, the lead barge on the starboard side allided with the concrete retaining wall on Bells Island, causing several barges to break loose. The tow continued to be pulled toward the dam, and one of the remaining barges allided with one of the dam's protective concrete pilings, causing additional barges to break away. The *Dale A. Heller* tow eventually lost all 14 barges; seven of them ended up against the dam, and four of those sank. The remaining seven barges were corralled and moved into the Marseilles Canal.

Two of the barges were later determined to be a total loss. Five other barges were damaged but still operative. Damage related to the barges and the loss of their cargo totaled $3,767,000. The Marseilles Dam sustained extensive damage in the allision. Gates 2 and 3 were rendered inoperative, while gates 4, 5, and 6 were less damaged and still operative. The total damage to the Marseilles Dam was estimated at between $40 million and $50 million. In addition, flooding in the city of Marseilles caused extensive damage to homes, businesses, and other property. Although the town may have flooded even if the allision had not occurred, the damage caused by the barge strikes likely exacerbated the flooding.

The Marseilles Dam after the barges broke away. Several barges can be seen pushing against the dam. The city of Marseilles, seen in the top right of the photo, flooded. (Photo by the Coast Guard)

Probable Cause

The National Transportation Safety Board determines that the probable cause of the allision of the *Dale A. Heller* tow with the Marseilles Dam was the decision by all involved parties to proceed with the passage of the tow during a period of record-high water and significant risk. Contributing to the accident was the failure of the Marseilles Dam lockmaster and the *Dale A. Heller* captain to communicate effectively about the actual positioning of the dam's gates before and during the transit.

Vessel Particulars

Vessel	*Dale A. Heller*
Owner	Midland Enterprises, Inc.
Operator	Ingram Barge Company
Flag	United States
Type	Towing vessel
Year built	1980
Official number (US)	624201
Construction	Steel
Length	128 ft (39 m)
Gross tonnage	596 gross tons
Engine power	5,600 hp (4,172 kW); diesel reduction
Crew complement	9

For more details about this accident, visit www.ntsb.gov/investigations/dms.html and search for NTSB accident ID DCA13NM017.

Adopted: June 13, 2014

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 49 *United States Code* 1131. This report is based on factual information either gathered by NTSB investigators or provided by the US Coast Guard from its informal investigation of the accident.