



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

August 29, 2024

MIR-24-25

Breakaway of Bulk Carrier *Sirocco* and Subsequent Collision with Moored Barge

On March 27, 2023, about 0208 local time, the bulk carrier *Sirocco* broke free from its moorings at the Convent Marine Terminal, located at mile 160.9 on the Lower Mississippi River in Convent, Louisiana, drifted downriver, and at 0249 collided with a barge moored at the Mosaic Uncle Sam dock at mile 160.4 (see figure 1 and figure 2).¹ There were no injuries, and no pollution was reported. The *Sirocco*, the barge, and the Mosaic Uncle Sam dock sustained damage totaling about \$5 million.



Figure 1. *Sirocco* at anchor after the collision, on March 28, 2023.

¹ (a) In this report, all times are central daylight time, and all miles are statute miles. (b) Visit [ntsb.gov](https://www.ntsb.gov) to find additional information in the [public docket](#) for this NTSB investigation (case no. DCA23FM024). Use the [CAROL Query](#) to search investigations.

Casualty Summary

Casualty type	Collision
Location	Lower Mississippi River, mile 160.4, Convent, Louisiana 30°2.29' N, 90°50.17' W
Date	March 27, 2023
Time	0208 central daylight time (coordinated universal time -5 hrs)
Persons on board	31 (<i>Sirocco</i>), 0 (barge <i>MEM 5087</i>)
Injuries	None
Property damage	\$5 million est.
Environmental damage	None
Weather	Visibility 7 mi, overcast, winds south 10 kts, air temperature 75°F, water temperature 56°F, sunrise 0658
Waterway information	River, width 1,400 ft, depth 80 ft (at Convent Marine Terminal), Carrollton gage (mile 102.8) 11.5 ft, current 3.5–4.5 kts

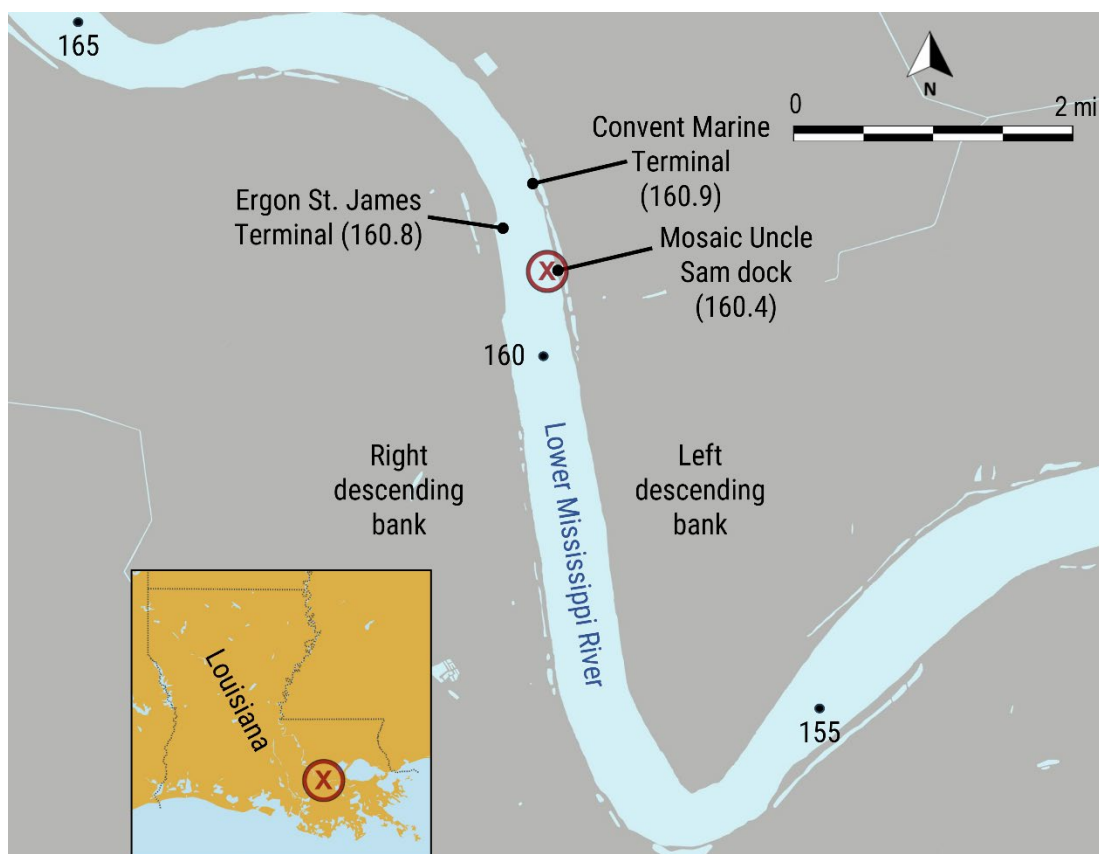


Figure 2. Area where the *Sirocco* collision occurred, as indicated by a circled X. (Background source: Google Maps)

1 Factual Information

1.1 Background

The 751-foot-long *Sirocco* was a Panama-flagged bulk carrier constructed of welded steel and built in 2014. The vessel was owned by Mazovia Investments Inc., operated by V.Ships Asia Group Pte Ltd, and under charter by Oldendorff Carriers, GmbH.

The Convent Marine Terminal (CMT) was located at mile 160.9 on the left descending bank of the Lower Mississippi River.² Coal was loaded onto ships at CMT via two independent ship loader systems.

The Mosaic Uncle Sam dock, located at mile 160.4 on the left descending bank, provided vessel berthing for unloading raw materials and loading products from the on-site phosphate production plant.

1.2 Event Sequence

1.2.1 Precasualty Events

On March 14, 2023, the Carrollton gage on the Lower Mississippi River (mile 102.8) exceeded 12 feet, prompting CMT's high-water loading plan to be activated. The plan required vessels with capacities between 60,001 and 100,000 deadweight tons (like the *Sirocco*) to have one hold-in tug, with an additional tug required when a vessel's mid draft reached 35 feet. CMT also required both anchors to be out of their pockets and ready to work.

On March 24, the *Sirocco* anchored in the Lower Kenner Bend Anchorage near mile 114. While at the anchorage, representatives from the vessel charterer surveyed the vessel's cargo holds and mooring equipment. The port captain for the vessel charterer briefed the master and chief officer on CMT's required mooring arrangement, which necessitated placement of mooring lines from the bow to the terminal's 90- and 225-ton upriver mooring dolphins and the doubling up of breast lines on the vessel's bow. After the briefing, the chief officer wrote out instructions for

² The shorelines of Western Rivers are known as the left and right banks when traveling (facing) downriver. The left bank is called *the left descending bank*, and the right bank is called *the right descending bank*.

the ship's crew, including instructions that the duty officer and on-watch able seaman (AB) were to tend the mooring lines together.

On March 25, about 1712, the *Sirocco* got underway, headed upriver to CMT. The vessel moored starboard side to the north dock at 0100 on March 26 (its bow pointed upriver into the current). At the time, the Carrollton gage was at 11.9 feet and falling. The master ordered 16 lines to secure the *Sirocco*; under normal conditions, they would have used only 12 lines. The 16-line arrangement consisted of four head and four stern lines, two forward and aft spring lines, and two forward and after breast lines on a bight (loop), all placed according to the CMT high-water loading plan (see figure 3 and figure 4).



Figure 3. The forward mooring arrangement of the *Sirocco* at the CMT dock at 1227 on March 26, 2023. (Source: Oldendorff port captain)

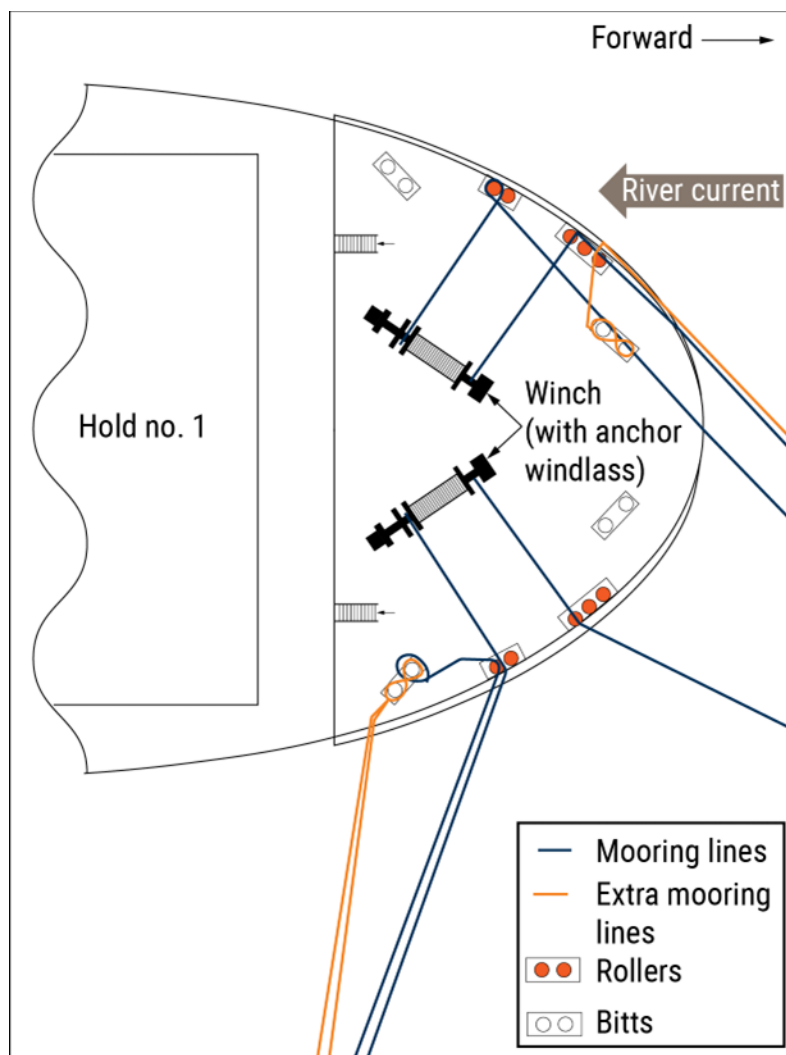


Figure 4. Forward mooring arrangement based on a drawing by the chief officer.

At the master's request, two hold-in tugs were positioned on the port side—one near the bow and one near the aftermost cargo hold (hold no. 7) (see figure 5).

The main propulsion engine was shut down, and, about 0300, cargo loading operations began. The plan was to load 73,014 tons of coal throughout all seven cargo holds. Prior to arrival at the dock, the charterer's surveyor had documented the ship's draft at 19.5 feet forward and 30.4 feet aft. Watchstanders checked the mooring lines and heaved in any slack as the ship's draft increased due to cargo loading.



Figure 5. The two tugs on the *Sirocco*'s port side on March 26 at 1314. (Background source: Oldendorff port captain)

About 1230, the port captain boarded the *Sirocco* at the CMT dock. Before boarding, the port captain noticed the vessel had slack mooring lines aft and photographed the area to show the master and remind him that no lines could be slack on the vessel. With both tugs still pushing the *Sirocco* into the dock, the master ordered the crew to continuously heave up and tighten slack lines.

According to the port captain, about the time he boarded the *Sirocco*, the Carrollton gage was at 11.8 feet and falling. Because the gage was below 12 feet, CMT's high-water loading plan was no longer in effect, and hold-in tugs were not required. He asked the master of the *Sirocco* to release the aft tug; the master agreed, and the aft tug was let go at 1315.

At 1408, the ship's agent emailed the master of the *Sirocco*, stating "the terminal no longer requires your vessel to have any hold-in tugs alongside." The port captain, copied on the email, forwarded this message to the master. He requested

the forward tug be released, stating that it is “normal practice to keep such size vessel alongside without any holding tug.” The port captain’s email further stated, “If you still insist to keep hold tug -- it will be solely for head owner’s account.” (The port captain explained to investigators that the charterer paid the cost for hold-in tugs when CMT’s high-water loading plan was in effect, but otherwise the cost would be charged to the *Sirocco* owner.)

The master released the forward tug; however, before being let go, the tug was ordered to stop pushing to allow the *Sirocco* crew to verify the forward mooring lines were holding the bulk carrier in place. The master later told investigators that he was surprised that hold-in tugs were no longer required, given the strength of the river current. The forward tug was let go at 1500.

Around the time the forward tug was let go, the port captain noticed that the speed of the current from the ship’s electronic chart and information display system (ECDIS), as measured by the ship’s speed log, was between 3.2 and 3.6 knots. The master and the second officer both recalled seeing the current as high as 4 knots on the ECDIS display.

At 1505, the port captain again noticed slack lines on the stern of the *Sirocco* and reminded the master again to keep them tight. The port captain departed, then later returned to the vessel at 1650 and saw that the lines were slack again. The port captain spoke to the master about the slack lines, and the crew heaved in the lines. According to crew interviews, deck crewmembers on watch knew of the master’s orders to keep the lines tight and worked to continuously do so. In addition to tending the lines, the watchstanders also had cargo operation duties, such as cleaning hatch tracks, taking tank soundings, closing cargo hatches, and gangway security watch. Loading operations continued throughout the remainder of the day on March 26.

1.2.2 The Breakaway and Collision

On March 27, about 0000, a scheduled change of watch took place. Three crewmembers came on watch: the second officer, an AB, and an ordinary seaman. The third officer told the second officer that they had been taking slack out of the lines frequently during his watch. The second officer stated that during his watch, the AB made rounds about every 20 minutes to check the forward and aft mooring lines. If there were any slack lines, the AB called him to help with heaving them according to the chief officer’s instructions. The second officer said they did a round between 0040 and 0100 to check the lines, and they heaved in all slack lines; all the lines were tight when they finished.

At 0050, the cargo loading shifted from no. 4 hold to no. 2 hold, which was the final hold to be loaded. After cargo hold no. 4 was loaded, the second officer took draft readings from the dock. The drafts were 37.1 feet forward and 48.4 feet aft. According to the second officer, there were no problems with the loading of the no. 2 cargo hold, but, given the hold's location at the forward end of the ship, the forward draft increased quickly.

About 0145, the second officer and the AB went forward to check the lines and found them to be very "really tight." They also saw that the bow had come away from the dock. They tried to heave on the breast lines, but, because the lines were tight, they were not able to heave them in with the vessel's electrohydraulic mooring winches.

About 0150, the second officer informed the master that the bow had come off the dock by about 1.5 meters (4.9 feet) and they couldn't bring the bow back alongside with the winches. The second officer then helped the AB with closing the hatches.

The master went to the bridge, and, at 0201, called the ship's agent and made a radio call for immediate tug assistance. The master radioed the second officer to go to the bow with the AB. At 0206, the velocity of the current according to recorded data from the vessel's speed log was 4.5 knots.

At 0208, the *Sirocco's* bow began to move farther to port, away from the dock, with its stern remaining alongside. At 0210, the master made a general announcement summoning all crew on deck. On his way to the bow from the port side, the second officer witnessed the forward mooring lines all paying out. He saw smoke and sparks from the portside winches. He and the AB could not go farther forward to the winches because it was unsafe with all the lines reeling out.

At 0212, the master informed the engine room crew that he needed the engine immediately. As the bow continued to move out into the river, greater tension was now being placed on the stern lines. About 0213, one line parted, and, as the stern started to move away from the dock, all the remaining lines began to pay out, and the vessel broke away from the dock. The master ordered the on-watch deck crewmembers to let go the anchors; he repeated the order 2 minutes later. At 0216, main engine propulsion control was transferred to the bridge for use.

Once safe to do so, the second officer and AB went to the bow and, at 0220, opened the brake and released the starboard anchor (which was already hanging out of the pocket). The anchor was let go to 1 shot (90 feet) on deck.

After hearing the master's announcement for all crew on deck, the chief officer went up to the bow. He saw that the ship was drifting sideways, downriver, with the ship's bow toward the right descending bank. The *Sirocco* was now adrift with all its mooring lines spooled off their reels with their bitter ends over the side of the dock and into the river; the other ends remained on the bollards on the dock. Remaining on board and dangling over the vessel's starboard side were the two parted mooring lines from the aft main deck and the stern winches.

Two tractor tugs—the *Savannah* (4,000 hp) and *South Carolina* (5,000 hp)—were moored at the Ergon St. James Terminal (mile 160.8) across the river on the right descending bank, about 680 yards away and downriver. Their crews heard a call for tug assistance. The *Savannah* got underway at 0215, and when it arrived at the *Sirocco* about 3 minutes later, it began to push near the port bow. At 0220, the *South Carolina* arrived at the *Sirocco*, which was broadside to the current, and pushed on the port bow, forward of the *Savannah*. With the parted lines in the water on the *Sirocco*'s starboard side, neither tug was able to approach the ship's starboard side out of danger of fouling their propellers. Both tugs were able to keep the *Sirocco* from drifting onto the unoccupied Ergon dock (the *Sirocco* got within about 200 feet of the dock).

At 0222, the *South Carolina* crew recommended that the *Sirocco* drop its anchors, and the master of the *Sirocco* gave the order to let go the port anchor. After ensuring there were no lines endangering the propeller, the master began using the ship's main engine propulsion at various ahead and stop propulsion orders.

About 0224, the *Sirocco*'s bow was oriented upriver with about 0.7 knots of drift downstream, the *Savannah* pushing at the port quarter, and the *South Carolina* pushing the port bow. The chief officer said that when the port anchor was let go, the brake was applied at 4 shots (360 feet), but the brake could not hold the chain, and the port anchor continued to pay out under heavy tension until the brake held the chain at 5 shots (450 feet) on deck, still under heavy strain. By 0240, the *Sirocco*'s bow was oriented into the current, but the vessel was drifting downriver at 0.2 knots.

At 0245, the *Sirocco*'s bow moved to starboard, exposing more of the vessel's port side to the current, and the master used the main engine and rudder with various orders (ahead) to help stop the drift of the ship. By 0248, the bulker was drifting downriver about 4 knots and closing on the Mosaic Uncle Sam dock on the left descending bank. Both tugs continued efforts to stop the vessel's drift downstream.

At the Mosaic Uncle Sam dock, three barges were moored alongside each other. The hopper barge *MEM 5087* was outboard of the crane barge *Glenn S* and

the deck barge *Burnside II*, which was moored to the dock (see figure 6). The barge *MEM 5087* was being loaded with phosphoric rock from the crane on the *Glenn S*.

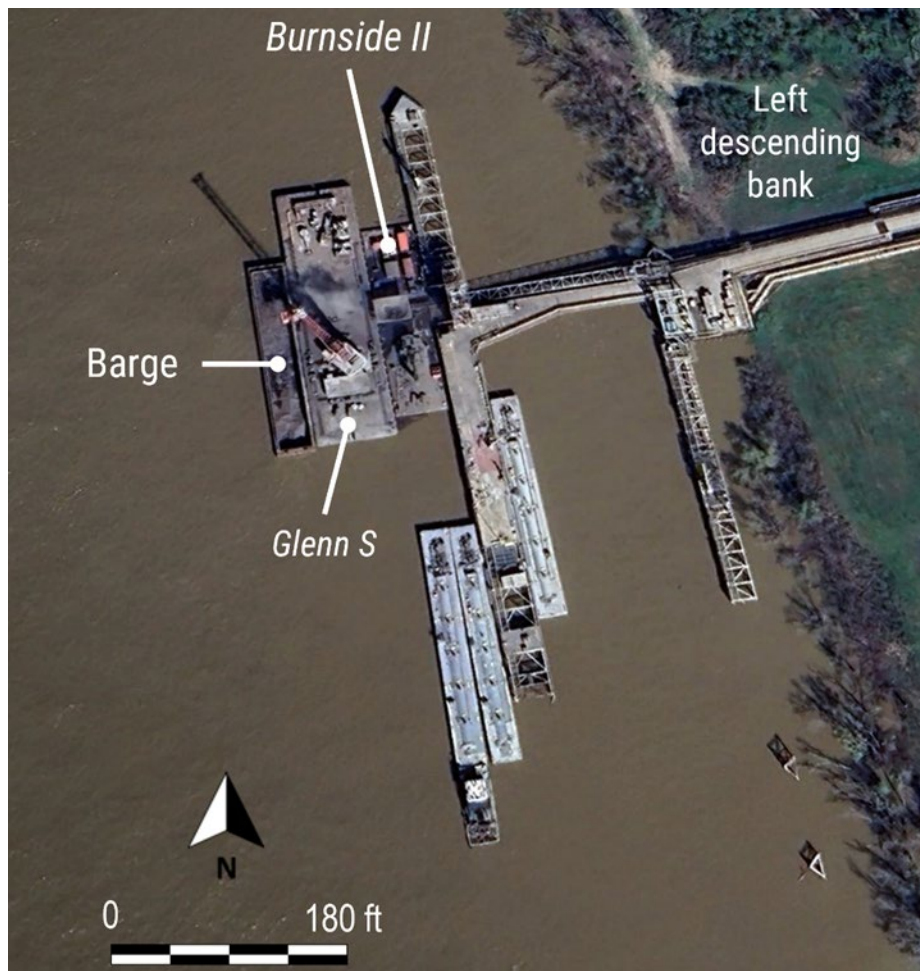


Figure 6. The Mosaic Uncle Sam dock with a barge similar in size to the *MEM 5087*, *Glen S*, and *Burnside II* alongside the dock on March 4, 2023. (Background source: Google Earth)

At 0248, audio from the *Glenn S* crane camera captured the continuous sound of a tug whistle as the *Savannah* crew tried to warn the workers at the Mosaic Uncle Sam dock of the impending collision. Footage also showed the loading operation stopping and workers evacuating the *Glenn S* (the *MEM 5087* did not have any workers on it).

The *Sirocco* continued toward the dock, where, at 0249, the ship's starboard quarter struck the port side of barge *MEM 5087*. The *Sirocco* drifted aft along the *MEM 5087* before the vessel stopped and moved ahead and away, using the main engine and the tugs. All barges remained moored at the Mosaic Uncle Sam dock after the collision.

The *Sirocco's* master, with assistance from the two tugs, maneuvered away from the Mosaic Uncle Sam dock and out into the middle of the river. About 0300, another tractor tug, the *Elizabeth B* (4,000 hp), came alongside to assist; the bulker, with its engine, anchors, and three tugs, was able to hold this position and await a pilot (see figure 7).

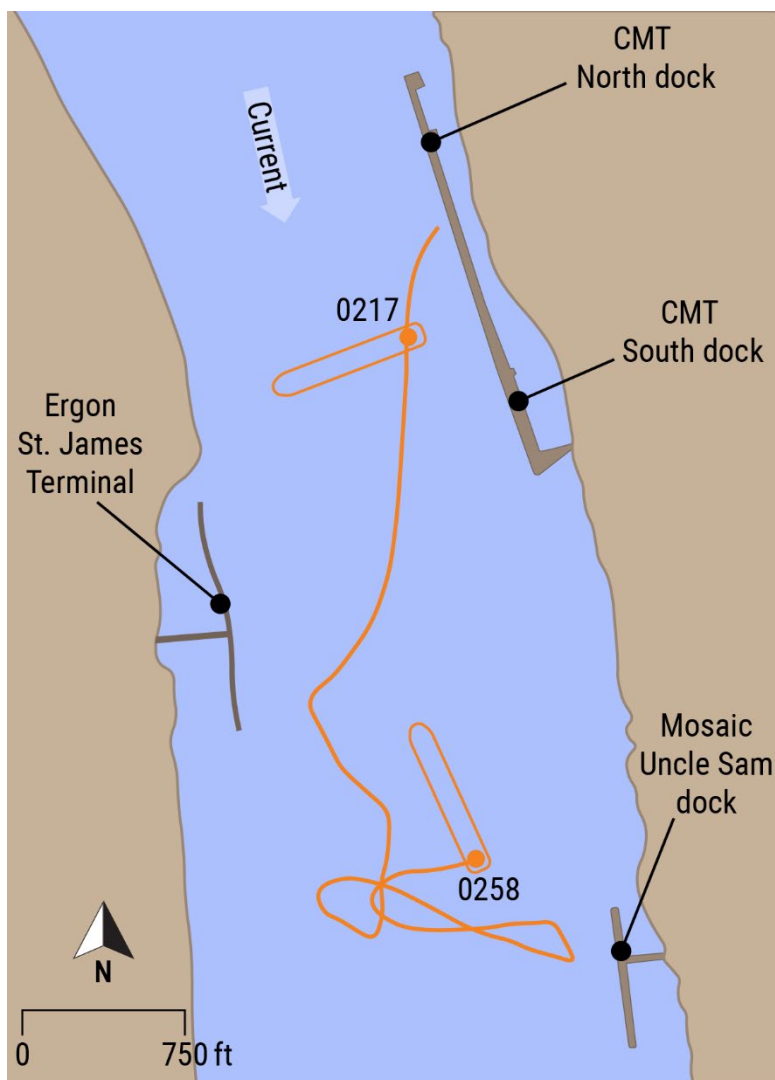


Figure 7. The *Sirocco's* track after breaking away from the CMT north dock. (Data source: *Sirocco* ECDIS)

At 0305, a New Orleans-Baton Rouge Steamship Pilots' Association pilot boarded the *Sirocco* and, once on the bridge and briefed by the master, took over the conn. At 0315, the crew started recovering the parted mooring lines from the water as the pilot secured a tug with a line near the port bow and one with a line on the stern. All lines were recovered at 0355, and another tug was secured with a line at the starboard bow. Both anchors were heaved up and secured by 0430. The pilot

maneuvered the vessel to the Grandview anchorage (near mile 147), arriving about 0600. At 0712, the vessel was secured with both anchors holding the vessel in the water.

1.3 Additional Information

1.3.1 Damage

The *Sirocco* sustained damage to the starboard-side accommodation ladder and starboard aft rail (see figure 8). Two mooring lines parted: an aft breast line and an aft spring line. All other lines payed out, remained secured on the bollards at the dock, and showed no visible signs of damage.



Figure 8. The *Sirocco*'s damaged starboard-side accommodation ladder.

Pilings and several beams supporting the Mosaic Uncle Sam dock were pushed out of position, and the dock's concrete surface was damaged. Barge *MEM 5087* sustained extensive damage to its hull on the port side (150 feet in length), and about 100 feet of its coaming was set in, causing several deck and gunwale fractures (see figure 9). Five of the barge's transverse bulkheads were set in. The *MEM 5087* was considered a total constructive loss. The barges *Glenn S* and *Burnside II* sustained minor damage.



Figure 9. The damaged barge *MEM 5087*. (Source: Campana Marine Service)

1.3.2 Vessel Equipment

The master of the *Sirocco* told investigators that all deck machinery, the propulsion main engine, the steering gear, and navigation and communication systems were working properly before the breakaway and collision.

The chief officer said that, of the 16 mooring lines used, ten were 12-strand, 28-millimeter-diameter ultra-high molecular weight polyurethane (UHMWPE) and six (the extra lines) were eight-strand, 56-millimeter-diameter synthetic fiber (polyester-polypropylene). The vessel's mooring line certificates indicated the breaking force for the UHMWPE lines was 63 tons and the breaking force for the synthetic fiber lines was 61 tons. According to the company, these lines were adequate for use based on industry guidelines.³

A report completed by the attending charter party surveyors 3 days before the breakaway and collision, dated March 24, 2023, noted that the UHMWPE lines (which were fitted to the mooring winches) were in good condition. The report noted that the synthetic fiber lines had heavy wear and tear and were in poor condition. The surveyor also carried out a brake test of the mooring winches, with no discrepancies noted. Planned maintenance records from the *Sirocco* showed the brake liners were

³ The company followed guidelines from the Oil Companies International Marine Forum (OCIMF) Mooring Equipment Guidelines (OCIMF MEG 4, 2018) ([Mooring Equipment Guidelines \(MEG4\)](https://www.ocimf.org/Mooring-Equipment-Guidelines-MEG4) ([ocimf.org](https://www.ocimf.org))).

renewed in January 2021, and all mooring winch brakes had a brake-holding capacity test in December 2022, with no discrepancies noted.

The mooring winches on the *Sirocco* were designed to hold mooring lines on the brake to a maximum limit to allow for the brake to slip before a line reached its minimum breaking load and parted. The winches were not designed to hold mooring lines while in gear. The winch brakes (manual screw compressed band type) had an operational brake (rendering) load capacity set to 37.8 metric tons (60% of the ship design minimum breaking load of the mooring lines on the winches).

After the breakaway and collision, third-party technicians inspected the 10 mooring winches; two—the main deck winches for the forward and aft spring lines—failed the brake test. The company reported that the failure was from the mooring lines running out at high speed, causing excessive heat and vibration that damaged the brake mechanism. At the forward mooring winches, extreme heat and friction markings were found on the brake liners.

2 Analysis

While loading a cargo of coal, the bulk carrier *Sirocco* broke free from its moorings at the CMT dock, drifted downriver about a half mile, and collided with one of three barges (barge *MEM 5087*) moored at the Mosaic Uncle Sam dock.

The NTSB investigated an April 6, 2015, casualty involving the bulk carrier *Privocean*, which broke free from its moorings at CMT during high-water conditions (14.2 feet on the Carrollton gage on the day of the casualty), drifted across the river, and collided with the tanker *Bravo*, moored at the Ergon St. James Terminal. The probable cause of the collision was the inadequate mooring arrangement for the *Privocean* and the insufficient number of hold-in tugs provided by the vessel operator, given the prevailing conditions. About 3 weeks after this collision, CMT issued a high-water loading plan for vessels moored at the facility during high-water condition loading operations (when the Carrollton gage exceeded 12 feet).

When the Carrollton gage dropped below 12 feet, CMT's high-water loading plan was no longer in effect, and therefore CMT did not require hold-in tugs. The *Sirocco* initially had two tugs holding the vessel in, but they were released because the Carrollton gage dropped below 12 feet.

From the time the forward hold-in tug was released at 1500 on March 26 until the bow started to come away from the dock about 0200 on March 27—about 11 hours—the crew loaded cargo without incident, and the crewmembers were able to keep the vessel in place at the dock by continuously heaving on the lines to keep them tight. However, the addition of cargo significantly increased the vessel's draft. Before the *Sirocco* arrived at CMT, its draft was 19.5 feet forward and 30.4 feet aft. By the time loading began in the forward no. 2 hold at 0050 on March 27, the draft was 37.1 feet forward and 48.4 feet aft—an increase of 17.6 feet forward and 18 feet aft.

As cargo was loaded in the no. 2 hold and the vessel's draft increased, the bow moved lower relative to the dock. If the lines were not heaved, any slack in the mooring lines would have allowed the bow, which was pointed upriver and exposed to the river current, to come off the dock (a greater surface area of the hull was exposed to the current as the vessel's draft increased, leading to continuously strengthening forces pushing the vessel off the dock—increasing tension in the lines). Deck crewmembers were tending lines but simultaneously had cargo operation, security, and other duties while on watch. Although crewmembers worked to tend the lines throughout cargo loading, they did not effectively monitor the bow lines as the loading of the forward holds commenced, allowing the bow to come off the dock. When the crew attempted to heave the bow back to the dock, they could not, because the mooring winches could not overcome the increased tension.

By design, a mooring winch brake provides friction to the shaft of the winch drum. When the winch's brake-rendering load is exceeded (set relative to the breaking strength of the line in use), the tension on the line causes the winch drum to overcome the friction of the brake pad and slip, allowing the mooring line to release any excessive load and pay out, thus preventing the line from parting—a dangerous condition. The second officer observed smoke and sparks coming from the winches during the breakaway. Additionally, the postcasualty examination of the winch brake liners on the *Sirocco's* bow found that they exhibited extreme heat and friction, indicating that the tension on the forward mooring lines exceeded the forward mooring winches' brake-rendering load (capacity), causing the lines to pay out (slip), resulting in the vessel breaking away from the dock.

Both anchors were hanging out of the pockets and ready to let go (holding on the brake) while the vessel was loading. The master gave the order to let go the anchors at 0213. However, the first (starboard) anchor was not let go until 0220, 7 minutes after the master's order, because it was unsafe to access the bow while the mooring lines were paying out. The starboard anchor was let out to 1 shot (90 feet) on deck. However, the water depth was about 70 feet (at the time the anchor was let go), and the height of the ship's mooring deck above the water at the time was about 40 feet—meaning, at least 110 feet of anchor chain would have needed to be let out for the anchor to touch the bottom. Although the port anchor was let go, it was not let go until about 12 minutes after the ship broke away from the CMT dock. The port anchor chain was let out and held at 5 shots (450 feet) on deck under heavy tension, which helped slow the downriver drift of the *Sirocco* (along with the two assist tugs). Had the starboard anchor been let out to an effective length for the depth of the water, both anchors may have held the *Sirocco* in the river, preventing the collision.

3 Conclusions

3.1 Probable Cause

The National Transportation Safety Board determines that the probable cause of the breakaway of the bulk carrier *Sirocco* from the Convent Marine Terminal dock and the subsequent collision with moored barge *MEM 5087* was the bow coming off the dock during cargo loading in the forward holds, exposing more of the vessel's underwater hull to the strong river current, resulting in the brake-holding capacities of the ship's mooring winches being exceeded and the lines paying out until the vessel broke free from the dock.

3.2 Lessons Learned

Preventing Vessel Breakaways While Loading in Strong Currents

To reduce the risk of a vessel breakaway, it is important for vessel crews to understand the forces that act on a vessel when it is moored into a strong current at a dock. Crews should ensure that slack is taken out of lines as the vessel loads, especially as the forward draft increases and the bow begins to sit lower in the water, exposing more of the hull to the current. Continuously monitoring and taking up any slack from bow lines as forward holds are loaded can help to ensure that the bow does not come away from the dock. Developing a response plan for a breakaway can ensure that crews are prepared to respond when one occurs. Vessel masters should also consider incorporating additional safety measures such as keeping propulsion, thrusters, and steering systems on short standby and having anchors ready for immediate use (even if not required by the loading facility). Vessel masters should be familiar with how to request tug support on short notice.

Vessel Particulars

Vessel	<i>Sirocco</i>	<i>MEM 5087</i>
Type	Cargo, Dry Bulk (Bulk carrier)	Towing/Barge (Barge)
Owner/Operator	Manzovia Investments/ V.Ships Asia Group PTE (Commercial)	American Commercial Barge Line Vessels, Inc (Commercial)
Flag	Panama	United States
Port of registry	Panama City, Panama	St. Louis, Missouri
Year built	2014	1998
Official number (US)	N/A	1065939
IMO number	9603996	N/A
Classification society	Bureau Veritas	N/A
Length (overall)	753.1 ft (229.5 m)	200.0 ft (61.0 m)
Breadth (max.)	105.8 ft (32.2 m)	35.0 ft (10.7m)
Draft (casualty)	37.1 ft (11.3 m) fwd, 41.8 ft (12.7 m) aft	N/A
Tonnage	43,974 GT ITC	764 GRT
Engine power; manufacturer	1 x 13,142 hp (9,800 kW); 5S60MC-C8 B&W diesel engine	N/A

NTSB investigators worked closely with our counterparts from **Coast Guard Sector New Orleans** throughout this investigation.

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For more detailed background information on this report, visit the [NTSB Case Analysis and Reporting Online \(CAROL\) website](#) and search for NTSB accident ID DCA23FM024. Recent publications are available in their entirety on the [NTSB website](#). Other information about available publications also may be obtained from the website or by contacting—

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