February 6, 2025 MIR-25-08

Collapse of Chalmette Refinery Dock Section During Docking of *Ovide J* Tow

On April 25, 2023, about 0004 local time, the towing vessel *Ovide J* was maneuvering two loaded crude oil barges to the Chalmette Refinery crude oil dock near mile 89 on the Lower Mississippi River in Chalmette, Louisiana, when the starboard barge contacted the dock, after which about 150 feet of the dock collapsed into the water (see figure 1 and figure 2).[1] There were no injuries, and no pollution was reported. There was extensive damage to the dock's pipelines, bridges, and pilings. The estimated cost of repairs to the dock was about $7 million.[2]

Figure 1. Towing vessel *Ovide J* underway on the Mississippi River on unknown date before the dock collapse. (Source: Michael Farrell, marinetraffic.com)

[1] In this report, all times are central daylight time, and all miles are statute miles.

[2] Visit ntsb.gov to find additional information in the public docket for this NTSB investigation (case no. DCA23FM031). Use the CAROL Query to search investigations.

Casualty Summary	
Casualty type	Other
Location	Chalmette Refinery crude oil dock, Lower Mississippi River near mile 89, Chalmette, Louisiana 29°55.56′ N, 89°57.9 W
Date	April 25, 2023
Time	0004 central daylight time (coordinated universal time –5 hrs)
Persons on board	5
Injuries	None
Property damage	$7 million est.
Environmental damage	None
Weather	Visibility 10 mi, clear, winds north-northeast 5 mph, calm seas, air temperature 68°F, water temperature 71°F
Waterway information	River; flood stage 7.2 ft, gage height 10.3 ft, current about 3.7 mph

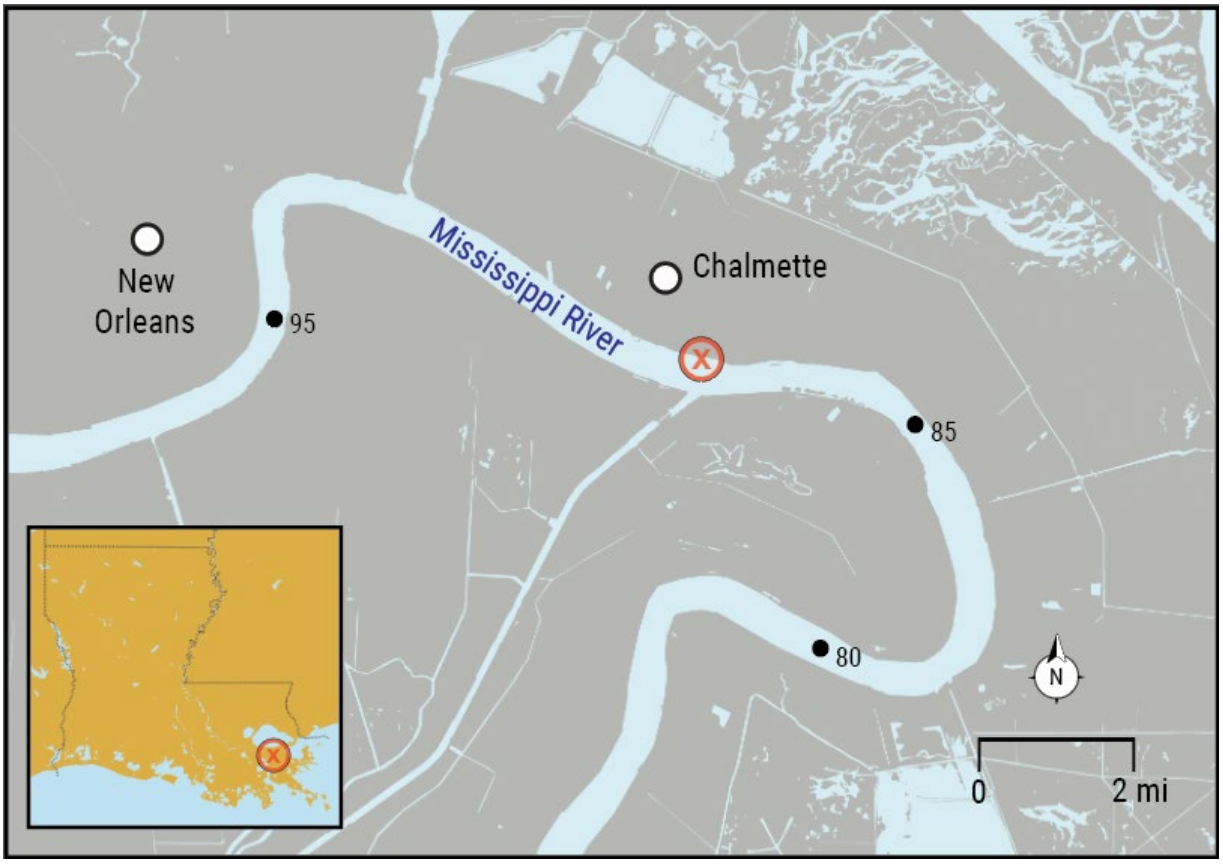

Figure 2. Area where the Chalmette Refinery crude oil dock section collapsed, as indicated by a circled *X*. (Background source: Google Maps)

1 Factual Information

1.1 Background

The 76-foot-long towing vessel *Ovide J* was originally owned by Cenac Towing Company Inc. of Houma, Louisiana, and named *Ovide J Cenac*. In 2008, Teppco Marine Services Incorporated of Houma acquired the vessel. In 2009, Enterprise Marine Services of Houston, Texas, acquired the vessel and renamed it *Ovide J*.

The *Ovide J* was retrofitted and repowered in 2010. Three Cummins KTA19 diesel engines, with twin disc reduction gears, provided 1,920 hp to three fixed-pitch propellers. The vessel was outfitted with three rudders and two flanking rudders for maneuvering.

The Chalmette Refinery crude oil dock, constructed in 1967, was located on the left descending bank of the Lower Mississippi River and consisted of wood and steel pilings, dolphins, and elevated bridges (see figure 3).[3] The elevated bridges were connected in series to a transfer platform located on dolphin no. 3. Three 16-inch crude oil pipelines ran the length of the dock to the transfer platform on dolphin no. 3, which contained a boom crane, an associated pipe manifold, and shore-provided hose connections. The dock had two berths: one inshore berthing with a forward fendering dolphin and one offshore berth.

[3] The inland towing industry refers to the shorelines of Western Rivers 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*.

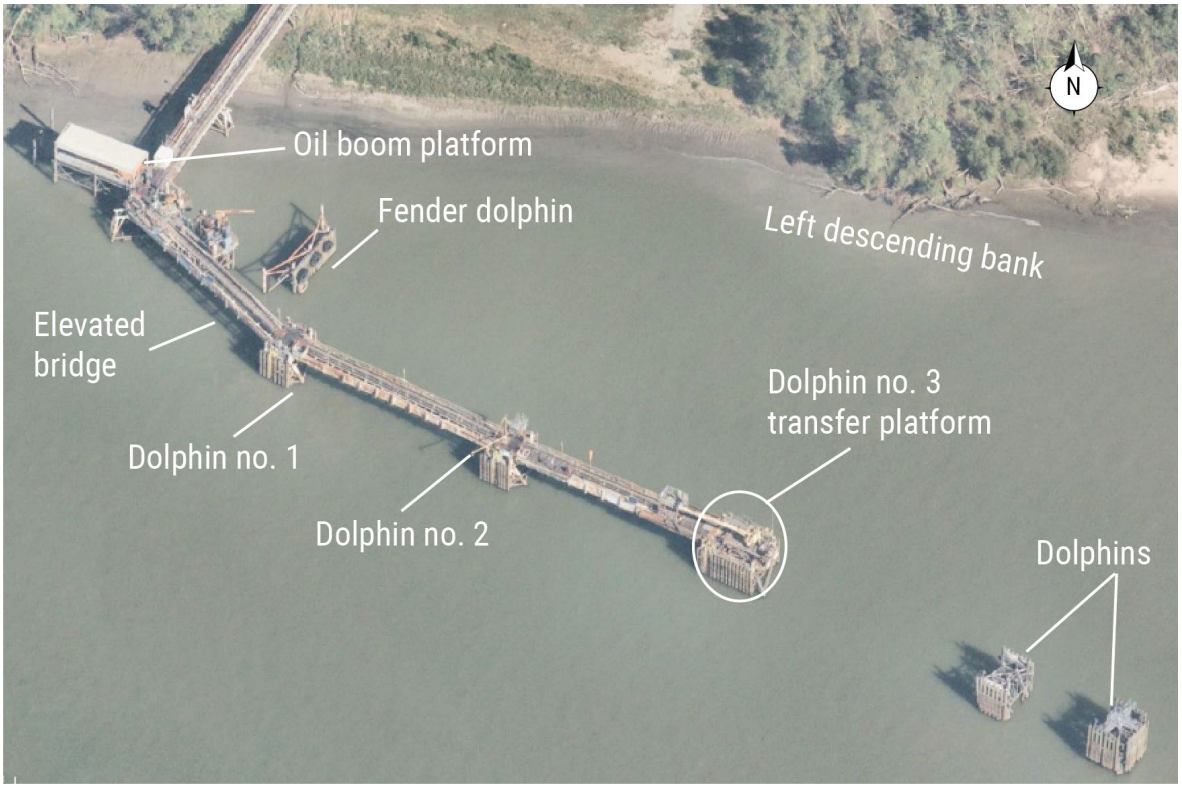

Figure 3. The Chalmette Refinery crude oil dock. (Background source: Nearmap)

1.2 Event Sequence

On April 23, 2023, at 1233, the towing vessel *Ovide J* departed the Plains All American Oil Terminal in St. James, Louisiana, near mile 158 on the Lower Mississippi River, pushing two loaded crude oil barges (*EMS 348* and *EMS 321*) downriver to the Chalmette Refinery crude oil dock, in Chalmette, Louisiana, near mile 89. The tow was arranged with two 297-foot-long-by-54-foot-wide tank barges side by side, with the *EMS 348* to starboard and the *EMS 321* to port, for a total (vessel and tow) of 373 feet long and 108 feet wide (see figure 4). There were five crewmembers on board: a captain, relief captain, tankerman, and two deckhands.

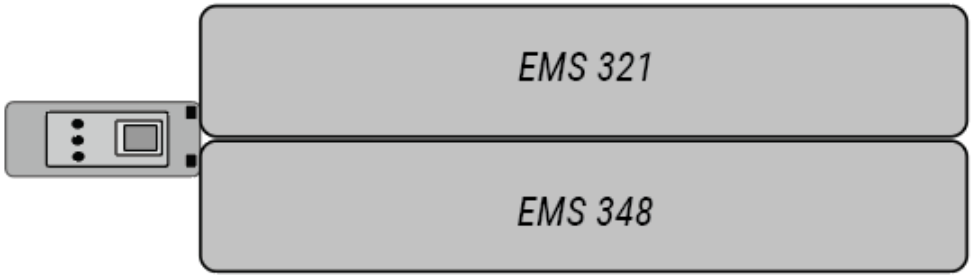

Figure 4. *Ovide J* tow arrangement (scale approximate).

When the tow arrived in the area of the Chalmette Refinery dock later that evening about 2130, it temporarily moored at the nearby Turn Services fleeting area, located on the left descending bank, 1.6 miles north (upriver) of the crude oil dock, because another tow was at the dock discharging crude oil to the refinery.

The following day, on April 24, about 2200, the lead wharfman at the Chalmette Refinery dock contacted *Ovide J*'s captain to confirm the intended discharge quantity of 50,000 barrels of crude oil and provide docking instructions. The captain told the lead wharfman that the tow would arrive around midnight. The lead wharfman acknowledged the captain's arrival time and told him that they would have a dock operator at the pier.[4]

At 2228, the *Ovide J* tow departed the fleeting area for the crude oil dock. The captain and a deckhand were on watch in the wheelhouse. The weather was clear, with light winds from the north-northeast at 4.5 mph. The river current was about 3.7 mph. The captain noted no issues with the mechanical condition of the vessel.

The relief captain told investigators he woke up about 2245. Just before 2330, the relief captain arrived in the wheelhouse for his 2345 scheduled watch. The relief captain and the captain completed a watch changeover and discussed the plan to proceed downriver past the Chalmette Refinery dock, and then "top around" to bring the head of the tow into the current and approach the dock from downriver, to dock starboard side to the pier.

According to the relief captain, this was his twentieth time maneuvering to the Chalmette Refinery crude oil dock in the past year, with the most recent docking occurring 3 days before, on April 21 at 0334. The relief captain had been with the

[4] *Dock operators* assist vessels with docking, handling lines, aligning the vessel manifold with shore connections, and assembling the hoses.

company for over a year and a half at the time of the contact, and he had sailed in the capacity of relief captain on similar towing vessels for about 11 years.

At 2347, the relief captain assumed the watch. The captain remained in the wheelhouse, and the oncoming deckhand relieved the offgoing deckhand of the watch. The oncoming deckhand proceeded to the head of the tow to call out distances to the dock via VHF radio and prepare for line handling. The tankerman had been awakened to assist with the tow's arrival at the dock. He was positioned on the stern of the *Oxide J* for line handling and to call out the tow's distance and position from the dock to the relief captain via VHF radio.

All three engines were clutched in reverse, slowing the vessel's headway in anticipation of performing the top around maneuver. After the relief captain confirmed the area was clear of vessel traffic, he began the top around maneuver on the left descending bank side of the river, orienting the head of the tow toward the center of the river.

At 2356, the tow was facing upriver, positioned about 400 feet out from the crude oil dock and 150 feet downriver from the transfer platform where the tow would dock. The relief captain next began to slow the tow to prepare for docking at the platform. He clutched the three propulsion engines in and out of forward and reverse while using both the main rudder and flanking rudder. According to the relief captain, "I come on the dock the same way every single time. I come in slow and as even as possible … using the river."

Shortly after midnight, at 0001 on April 25, the tow was approaching the dock at a speed of 0.46 mph. An onboard video recording system in the wheelhouse showed the relief captain getting up from the seat at the helm and sitting back down. He later told investigators that he was attempting to obtain a better line of sight of the head of the tow and starboard barge alignment with the transfer platform and shoreside manifold. The video also showed that the flags on the tow knees were moving in a direction from starboard to port (off the dock) and that floodlights illuminated the dock.

At 0002, the speed of the tow was 0.58 mph, and the onboard recording system showed the tow at an approach angle of 3–5° off the dock, with the starboard quarter of the starboard barge closest to the dock. At 0003, the speed of the tow was 0.23 mph, and the onboard recording system showed the tow traveling toward dolphin no. 3 with the head of the tow about 4° off the dock (see figure 5).

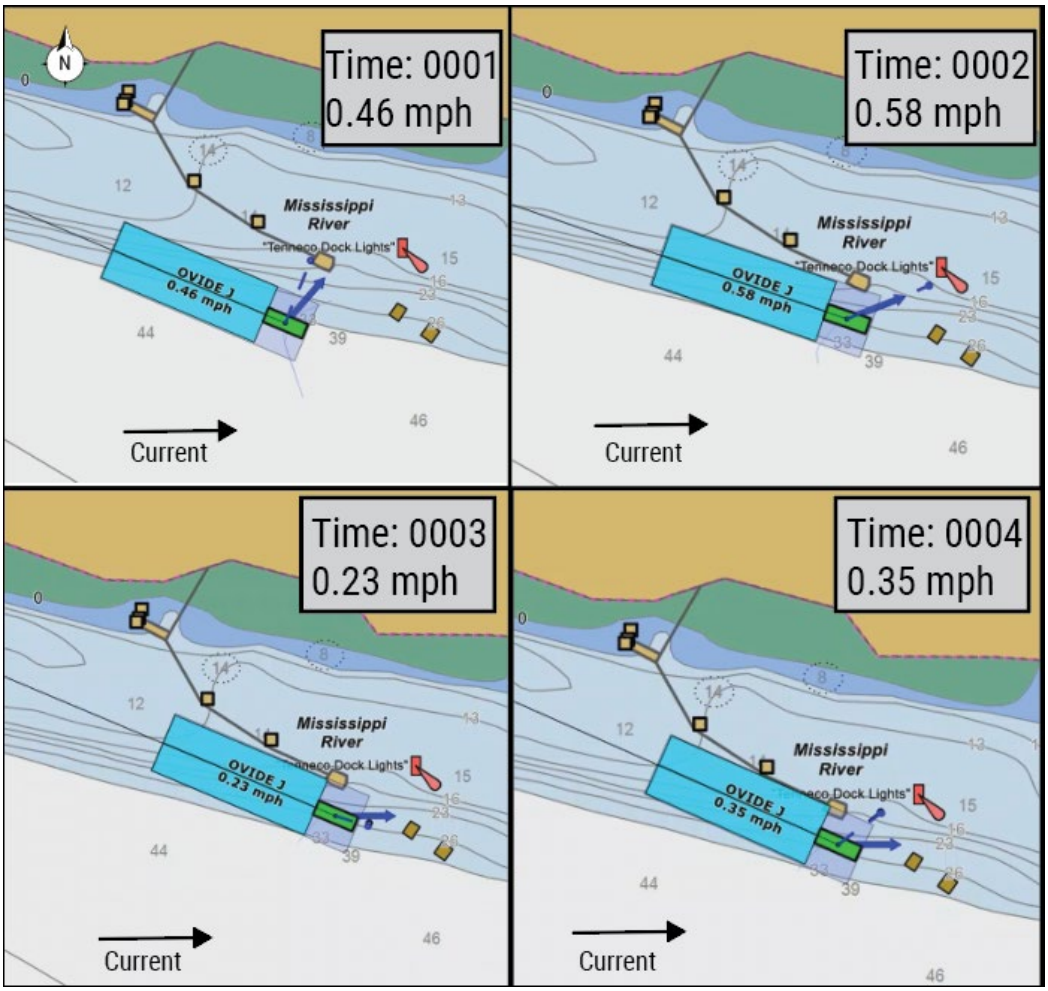

Figure 5. The *Ovide J* tow in the minutes before it contacted the Chalmette Refinery crude oil dock. Blue vector arrows indicate the tow's direction of motion. (Data source: *Ovide J* automatic identification system data in Rose Point software)

At 0004, as the tow moved downriver in the current (while still facing upriver), at a speed of 0.35 mph, the starboard quarter of the starboard barge (*EMS 348*) contacted the wooden fendering of the transfer platform at dolphin no. 3, and part of the dock collapsed into the river toward the shoreline (see figure 6). The onboard recording system captured the dock section falling into the water; the recording also showed that, in the wheelhouse, there were no signs of any movement from the contact (such as people getting jolted or VHF radio cables moving). The relief captain immediately placed the starboard engine in neutral to avoid entanglement of the starboard propeller with the fallen dock and floating hoses and lines on the submerged transfer platform.

The relief captain later described the tow's approach to investigators: "The current was about 3.7 [mph] and [I] started easing my way into the dock … you use the water to your advantage. … Because of the position of the dock and the way the

river is set up, it's at about a 15 and 20° angle in toward the bank. … It's not prudent mariner procedure to come in completely flat. So when you come in, you touch up stern first. … So, when I came in, I lightly touch on the stern. … As soon as I touched up, the dock collapsed. ... There was little to no sideways motion. If I had to do it again, I would do it the same way over again. I would not change a thing."

After the contact, the relief captain ordered the deckhand, who was forward on the starboard barge, to secure as many lines as he could to dolphin no. 1 and dolphin no. 2, which had not collapsed. The deckhand and tankerman secured five lines and one wire rope to the dolphins, and then they proceeded aft and boarded the towing vessel. The relief captain continued to position the tow, which remained intact, parallel to the pier, while the captain notified the company and refinery.

1.3 Additional Information

1.3.1 Damage

The *Ovide J* and barges sustained no reported damage from the contact with the dock. A US Coast Guard inspection following the casualty noted that no fendering timbers or pilings were damaged from the contact with the barge *EMS 348*.

The contact caused 150 feet of the dock to collapse inshore (see figure 6). A postcasualty survey revealed shearing of dolphin no. 3 support pilings 5 to 20 feet below the waterline (see figure 7). The dock settled to the riverbed, 10 feet below the river height at the time of the casualty. The transfer platform moved about 30 feet toward the shoreline and had a 10° inshore list. The elevated bridge remained connected to dolphin no. 3 but was about 17° closer to the shoreline than its original position. The estimated cost to repair the damage to the crude oil dock was $7 million.

Figure 6. The collapsed crude oil dock, looking upriver. Inset shows the area of the dock that collapsed (circled). (Sources: Coast Guard, Nearmap).

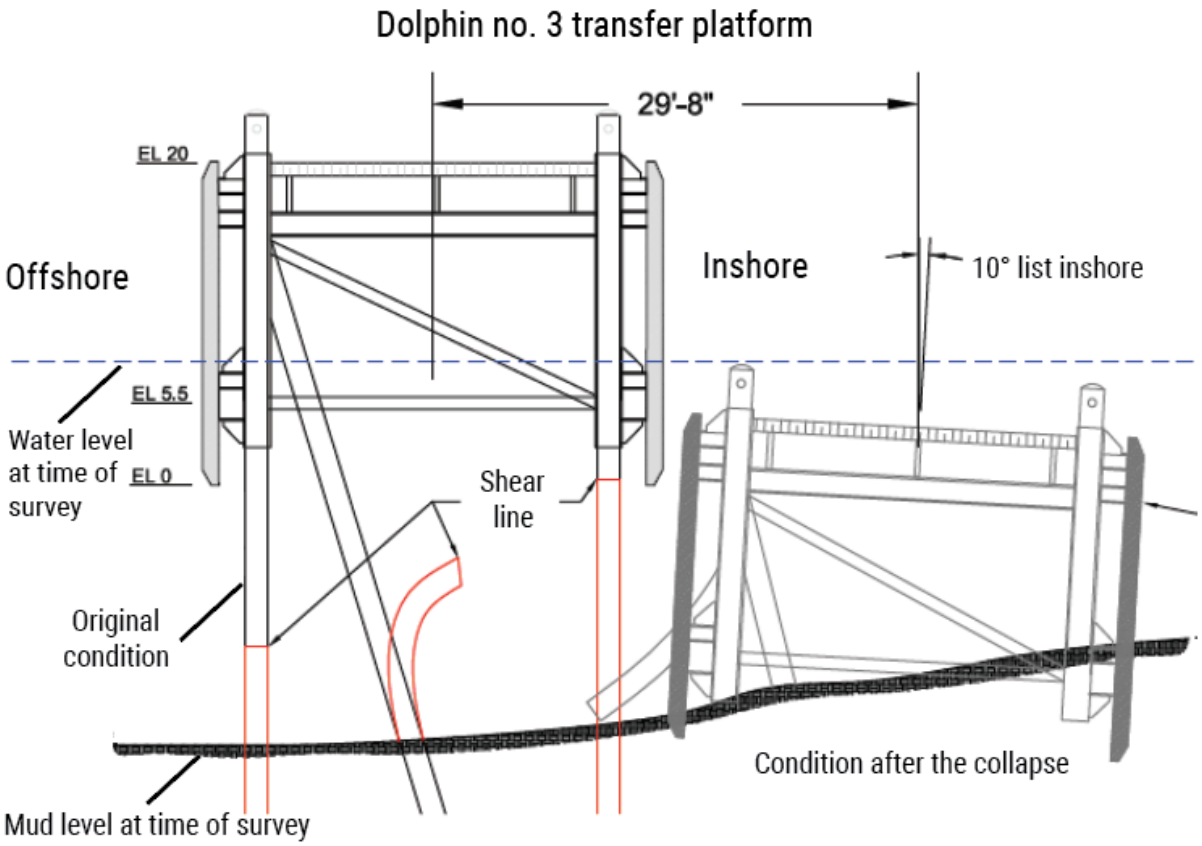

Figure 7. Postcasualty sketch of the dolphin no. 3 transfer platform at the Chalmette Refinery crude oil dock in its original condition and after the collapse. (Background source: Stewart Construction)

1.3.2 Structural Integrity of the Dock

A July 2017 inspection report from a third-party engineering firm classified several horizontal braces between dolphin no. 3 pilings as having major deterioration. Three braces were observed broken, and one horizontal brace had impacted another, compromising the weld at the jacket. The report further stated that two pilings were severely deteriorated, and all no. 3 dolphin pilings were shifted toward the shoreline.

In October and November 2021, another engineering firm performed a visual above-water inspection of the Chalmette Refinery crude oil dock, including the dolphin no. 3 transfer platform. The structural inspection form for the dolphin no. 3 transfer platform listed seven findings corresponding to damage, including disconnected header joints, bent beams, and significant corrosion (see figure 8). The firm documented four priority one (highest urgency) categories of damage as a result of the inspection: The structure exhibited (1) visible damage to the longitudinal lateral force-resisting system, (2) visible damage to the transverse lateral

force-resisting system, (3) visible damage to the vertical gravity system, and (4) significant corrosion.

Figure 8. *Left to right:* Visual inspection photos from 2021 showing a lower header joint not connected to the other column and a joint starting to disconnect on the dolphin no. 3 transfer platform at the Chalmette Refinery crude oil dock. (Source: Hopper Engineering Associates)

The third-party engineering firm advised, as part of its inspection report, that the dock owner follow up this visual, above-water inspection with a structural assessment of the piles and the dock. According to the dock owner, the recommendations from this inspection report had "not been progressed" as of the date the dock collapsed.

1.3.3 Postcasualty Actions

The dock owner stated that actions they were taking after the dock collapse included: conducting a marine structure survey, integrating results from the most recent structural engineering review and inspections of marine facilities into the mechanical integrity program, reviewing dock procedures to reinforce expectations of the person in charge during vessel dockings, and developing an asset management system for dock integrity to ensure structural inspection of docks with specified frequencies for above water and below water, to include a workflow process for actionable items.

2 Analysis

During the early morning of April 25, the *Ovide J* was maneuvering two loaded crude oil barges to the Chalmette Refinery crude oil dock when the starboard barge contacted the no. 3 dolphin transfer platform, after which about 150 feet of the dock collapsed into the water.

The experienced relief captain had successfully docked at this location nearly 20 times that year, including earlier that week. He told investigators, "If I had to do it again, I would do it the same way over again. I would not change a thing." The *Ovide J*'s approach was at a controlled speed (under 0.5 mph) and at a shallow angle. The tow did not break up as a result of the contact with the transfer platform, and the onboard recording did not show any jolting movement on the towing vessel, indicating that it did not strike the dock with a large amount of force. In addition, no fendering timbers were damaged from the contact, and none of the pilings were damaged from direct contact with the barge *EMS 348*.

A 2017 inspection report classified several horizontal braces between dolphin no. 3 pilings as having major deterioration. The report noted that two pilings were severely deteriorated, and all no. 3 dolphin pilings were shifted toward the shoreline. A 2021 visual structural inspection of the crude oil dock identified damage and deterioration, such as disconnected joints and corrosion at the dolphin no. 3 transfer platform. Although the company that completed the visual inspection recommended a complete inspection, according to the dock owner, as of the date the dock collapsed (which was about 1 year and 5 months after the 2021 inspection), the recommendations had "not been progressed."

The observed deterioration to the dolphin no. 3 transfer platform before the collapse indicated that the dock's structural integrity was severely degraded. Because a portion of the dock collapsed from what appeared to be a low-impact contact during docking, it is likely that the dock's dolphin no. 3 transfer platform structure was compromised to the extent that it could not sustain the forces from a typical docking. The dock owner was aware that the dock had structural integrity issues before the collapse but had not yet taken steps to address them. Following the dock collapse, the dock owner has begun taking measures to more closely monitor dock integrity.

3 Conclusions

3.1 Probable Cause

The National Transportation Safety Board determines that the probable cause of the collapse of a section of the Chalmette Refinery crude oil dock during the docking of the *Ovide J* tow was the degraded condition of the no. 3 dolphin transfer platform structure.

3.2 Lessons Learned

Maintaining Waterfront Infrastructure

It is important for dock owners to inspect, evaluate, maintain, and rehabilitate facilities, piers, docks, and other infrastructure to minimize the risk to the environment and the vessels that traverse the waterways. Scheduling inspections, as well as maintaining and replacing waterfront infrastructure and components, is critical to continued safe operations.

Vessel Particulars

Vessel	*Oxide J*
Type	Towing/Barge (Towing vessel)
Owner/Operator	Enterprise Marine Services (Commercial)
Flag	United States
Port of registry	Houma, Louisiana
Year built	1998
Official number	664963 (US)
IMO number	N/A
Classification society	American Bureau of Shipping
Length (overall)	76.0 ft (23.2 m)
Breadth (max.)	27.5 ft (8.4 m)
Draft (casualty)	10.7 ft (3.3 m)
Tonnage	150 GRT
Engine power; manufacturer	3 x 640 hp (477 kW); Cummins KTA19 diesel engines

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

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable cause of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for any accident or event investigated by the agency. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

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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 DCA23FM031. 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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