



# National Transportation Safety Board

## Marine Accident Brief

### Capsizing and Sinking of Workboat *MSRC 8-1*

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<b>Accident Type</b>	Capsizing	<b>No.</b> DCA19PM014
<b>Vessel names</b>	<i>MSRC 8-1</i>	
<b>Location</b>	Boothville Anchorage, Lower Mississippi River, mile 18, near Boothville, Louisiana 29°21.06' N, 089°25.33' W	
<b>Date</b>	January 16, 2019	
<b>Time</b>	1038 central standard time (coordinated universal time – 6 hours)	
<b>Injuries</b>	Two fatal	
<b>Property damage</b>	\$250,000 est.	
<b>Environmental damage</b>	Oil sheen on water	
<b>Weather</b>	Visibility 10 miles, clear skies, winds northeast 6–8 knots, rippled river surface conditions, air temperature 51°F, water temperature 43°F <sup>1</sup>	
<b>Waterway information</b>	The Boothville Anchorage is an area about 5 miles long where deep-draft vessels anchor in the Lower Mississippi River. The river was near flood stage on the accident date, and the current was estimated at 3–4 knots.	

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About 1038 local time on January 16, 2019, the workboat *MSRC 8-1*, which operated from the oil spill response vessel (OSRV) *Louisiana Responder*, capsized during an oil spill boom deployment exercise in the Lower Mississippi River near Boothville, Louisiana (mile 18), trapping both of its crew inside. While the OSRV's crew and the US Coast Guard worked to rescue the trapped *MSRC 8-1* crew, the boat sank. One crewmember died in the sinking; the other crewmember was not found and is presumed dead. The *MSRC 8-1* was declared a constructive total loss with damage estimated at \$250,000. A sheen of oil was sighted on the water after the vessel sank; no other pollution was reported.

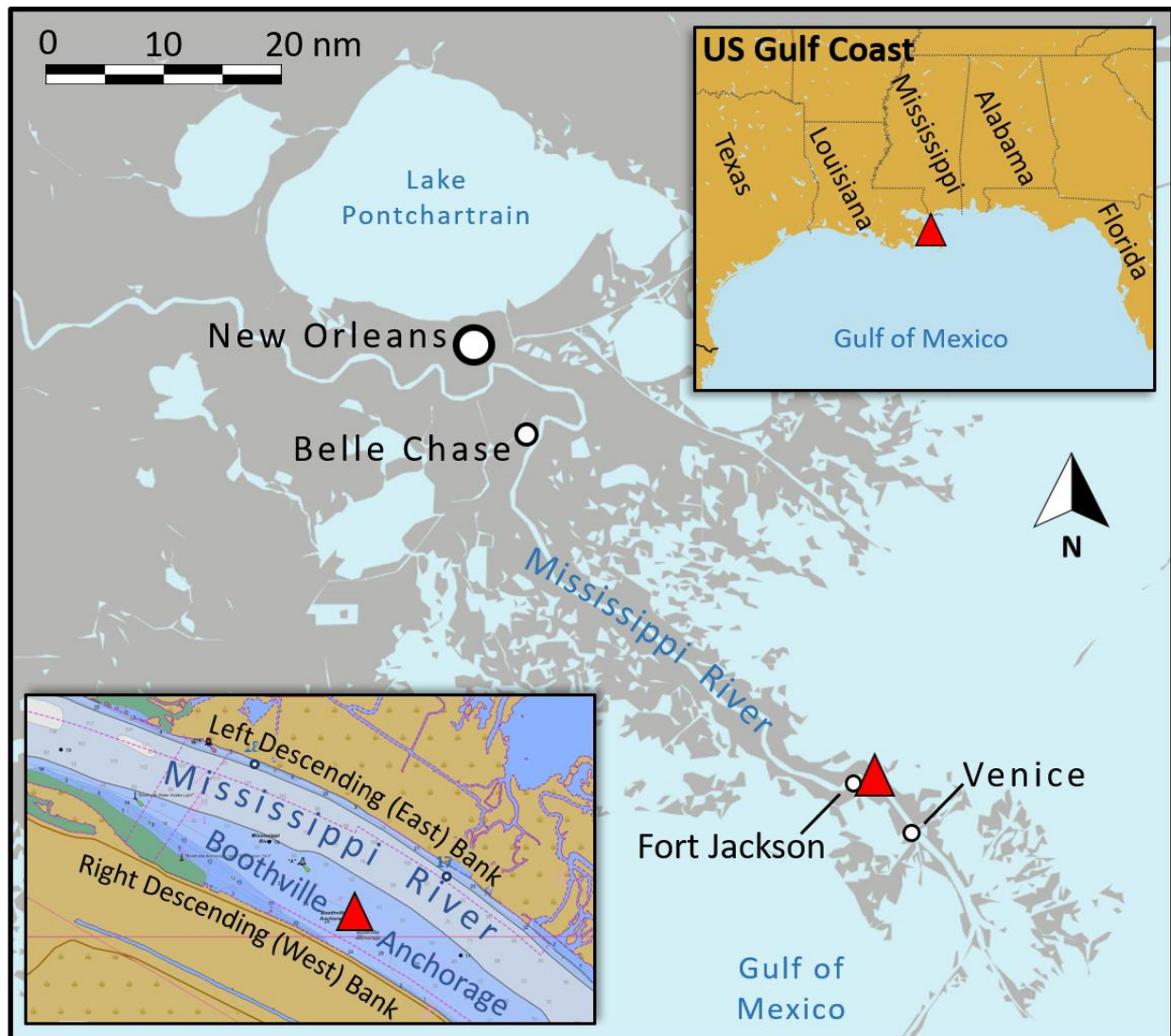


*MSRC 8-1* after salvage postaccident.

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<sup>1</sup> All miles in this report are statute miles.

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Accident location, as indicated by the red triangles in each map. (Background sources: Google Maps and National Oceanic and Atmospheric Administration [NOAA] electronic navigational chart US6LA5AM [lower left inset])

### Background Information

The 210-foot *Louisiana Responder* was purpose-built in 1993 to support oil clean-up operations. The vessel was owned and operated by the Marine Spill Response Corporation (MSRC), a not-for-profit oil-spill-removal organization. The vessel was maintained in a state of readiness so that, in the event of an oil spill, it could get under way within 2 hours to respond. The vessel was docked at Fort Jackson, Louisiana, alongside another OSRV, the *S.T. Benz Responder*, at mile 20.4 on the right descending bank of the Lower Mississippi River, a position that afforded both vessels quick access to the Gulf of Mexico.<sup>2</sup>

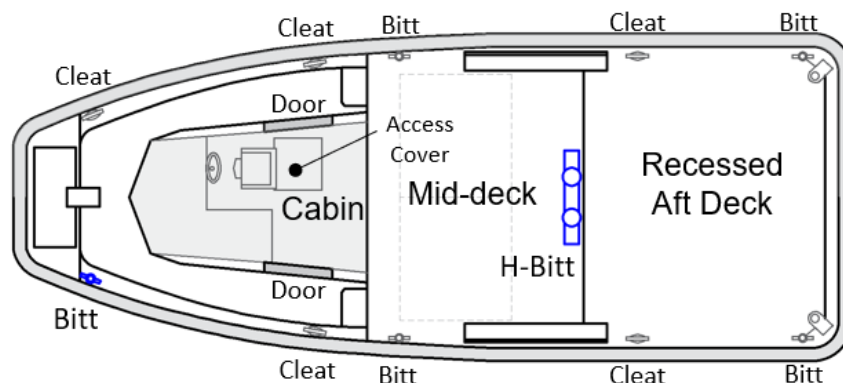
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<sup>2</sup> The inland towing industry refers to the shorelines of western rivers as the left and right banks when traveling (facing) downstream. The left bank is called the left descending bank, and the right bank is called the right descending bank

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The *Louisiana Responder* had a crew of six and, during a response or exercise, an on-call land-based team of responders that would join the vessel either at the dock or at a point when underway. The ship's crew was responsible for operating and navigating the *Louisiana Responder*, while the responder team was responsible for operating and maintaining the vessel's oil spill recovery equipment. A typical team of land-based responders was a crew of seven, consisting of six persons under the leadership of a site supervisor. On the day of the accident, the team included (in order of seniority) the senior master responder, overseeing the operation in lieu of a site supervisor, two master responders, two lead responders, an able-seaman responder, and a responder. The team's base of operation was at a warehouse located in Belle Chase, Louisiana (about an hour drive from where the ship was docked).

The oil spill response equipment on the *Louisiana Responder* included an oil spill containment boom, oil skimmers, and a 32-foot aluminum workboat designated the *MSRC 8-1*. The *MSRC 8-1* was a single-hull, twin-propeller, twin-rudder boat manufactured by Munson Manufacturing, Inc (now the William E. Munson Company), in Edmonds, Washington. Commonly called "the Munson" by company employees, the *MSRC 8-1* had two Caterpillar 3208TA 320-horsepower inboard engines, each connected to a propeller shaft. Welded to the underside of the hull was a framework that allowed the boat to be stored on deck or on land without a cradle. With the framework, the draft of the boat was about 4 feet 11 inches, and its weight full of fuel and water was 23,500 pounds. The boat was used in the deployment of the oil spill boom and other equipment on board the *Louisiana Responder*.



**32-foot aluminum workboat similar to the *MSRC 8-1*. The port forward single bitt and midship H-bitt used during the accident are shown in blue. (Photo source: Munson Manufacturing, Inc)**

## Capsizing and Sinking of Workboat *MSRC 8-1*

A tow post (also called an H-bitt because of its shape) was located on the midships deck of the *MSRC 8-1*. The operations manual for the boat cautioned that if the boat was towing using a line to the H-bitt, the operator was not to let the line tend more than 5–10 degrees off centerline directly astern. A towline tending more than 5–10 degrees risked capsizing the boat. Although the text of the caution note was capitalized and bolded in the manual, the warning was not posted anywhere in the vessel.

The rudder and engine controls for the *MSRC 8-1* were in a cabin at the forward part of the boat. Each propeller was controlled independently, while the rudders were controlled in tandem from the helm wheel. The cabin could be accessed on either side by sliding doors that opened in the direction of the bow. Behind the operator's helm chair was an access cover to a crawl space below the cabin, which was intended for stowage. The operations manual noted that none of the windows inside the cabin were designed for escape.

The vessel had self-bailing decks, meaning that water taken on deck from waves, rain, or spray would run off via scuppers and would not accumulate. The engine room hatches (covers) were flush with the midship deck. The hatches had rubber seals but had no means to be latched down and thus were not watertight.

The *MSRC 8-1* was stowed on the aft main deck of the *Louisiana Responder* and could be launched and recovered from a stern ramp using a system of rails and winches. According to MSRC's procedures, the *MSRC 8-1* was to have a crew of two: an operator and a deckhand. The operator controlled the vessel's propulsion and steering and communicated with the responders on the OSRV, while the deckhand tended to various lines, items in tow, and the deck equipment as directed by the operator.

## Accident Events

On Wednesday, January 16, a scheduled oil spill boom deployment exercise was to take place from the *Louisiana Responder*. MSRC OSRVs conducted oil spill boom deployment exercises on a monthly basis, with the exercises on the *Louisiana Responder* normally scheduled for the third Wednesday of every month. For this event, the ship was to get under way from its dock in Fort Jackson and sail to the Boothville Anchorage, about two miles downriver, where the vessel would drop anchor and conduct the exercise. The *Louisiana Responder* master stated that they always did their exercises in the Boothville Anchorage because it was a safe location that did not interfere with other vessel traffic.

Before getting under way from Fort Jackson, the seven MSRC land-based responders and a federal Bureau of Safety and Environmental Enforcement (BSEE) observer boarded the *Louisiana Responder*.<sup>3</sup> (BSEE observers and MSRC customers were invited to attend any exercise conducted by the company.) They met the vessel's crew in the galley and conducted a pre-exercise safety briefing. A checklist-type "training report and safety briefing form" was used to ensure that all company-required topics were covered. The form had 35 briefing items, including shipboard

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<sup>3</sup> BSEE oversees safety and environmental management systems and the implementation of various regulations related to the petrochemical industry, manages a near-miss reporting system, and conducts joint safety inspections with the Coast Guard.

## Capsizing and Sinking of Workboat *MSRC 8-1*

emergency alarms and procedures, communications, personal protective equipment, weather and river conditions, and stop work authority. All MSRC employees and the BSEE observer were briefed that they had stop work authority at any time should a safety concern arise. The master stated that they discussed the expected river current conditions and that all persons were given the opportunity to ask questions or state concerns at the safety brief. He recalled that no one had any safety-related questions or concerns.

The responders told investigators that the plan for the exercise was to deploy the oil spill boom in a J-configuration, a method that the responders commonly practiced in the Mississippi River. In this configuration, one end of the boom was attached to the stern of the OSRV, while the workboat towed the other end into a J-shape on the side of the OSRV where an oil skimmer was deployed. In an actual spill, the oil on the surface was gathered in the curve of the J and then skimmed off. According to MSRC, the J-configuration could be used in all operating environments, although some of the responders stated that the configuration would not be effective in containing oil in river current conditions.



**J-configuration deployment of oil spill boom by MSRC OSRV (right) and 32-foot workboat (left) during *Deepwater Horizon* oil spill response in May 2010. (Source: Munson Manufacturing, Inc)**

The safety briefing form documented that an inflatable 660-foot Sea Sentry II oil spill boom was to be deployed, and the main skimmer, located on the starboard side of the *Louisiana Responder*'s aft main deck, would be exercised.<sup>4</sup> At the pre-briefing, specific tasks for the exercise were assigned to each of the responders. The senior master responder stated that the master responder assigned to operate the *MSRC 8-1* for the exercise had volunteered for the task, and that the responder—the newest member of the team—had requested to be the deckhand. Knowing that the responder had all the company-required training for that task, the senior master responder agreed to her request.

At 0830, the *Louisiana Responder* got under way for the anchorage. About 0910, it let go its starboard anchor in the upper anchorage at mile 17.7. Weather conditions were reported to be clear skies and light winds, with an air temperature of 51 degrees and a water temperature of 43 degrees. River surface conditions were observed to be rippled. Reports on the velocity of the river current in the vicinity of the accident varied from 2 to 4.7 knots. The master of the *Louisiana Responder* recalled that during the pre-operation safety briefing the current was noted as being “3.5 plus knots, at least.”

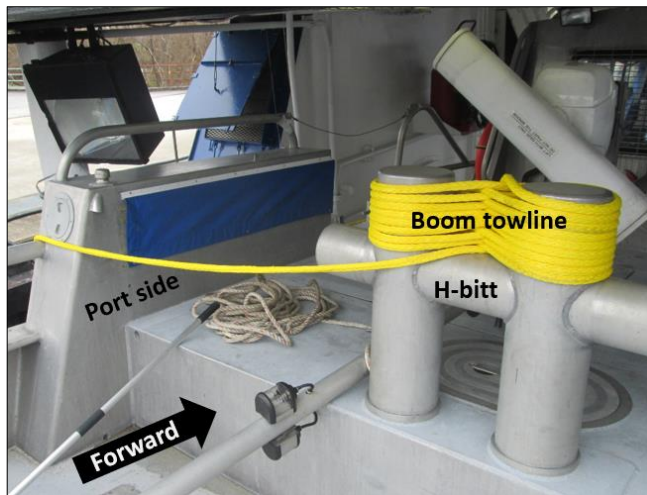
Once the responders were ready and the master was confident that the ship's anchor was not dragging, the responders launched the *MSRC 8-1* to begin the exercise. The boat was

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<sup>4</sup> The Sea Sentry II boom provides a barrier to contain, collect, or protect areas from materials (primarily oil) floating on the water. The boom is provided in 110-foot sections. (source: *Engineered Fabrics Operations and maintenance instruction manual, no. 150-ED-163 23-44 Sea Sentry II oil boom*).

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waterborne at 0935 with the operator and deckhand aboard. From video taken of the preparation and launching of the boat, both boat crewmembers were wearing helmets, the operator was wearing an inflatable lifejacket, and the deckhand was wearing an orange floatation coat.



The H-bitt on a workboat of same design as *MSRC 8-1*, with towline secured to the bitt.

According to the senior master responder, he and the other responders watched the deckhand correctly secure the towline at both locations on the *MSRC 8-1*.

Once the boom towline was secured, the *MSRC 8-1* operator backed away from the *Louisiana Responder*, allowing the boat to keep tension on the boom as it was paid out from a hydraulically driven reel and inflated on deck. The boom deployed as expected, and when the last section of the boom entered the water, the responders on board the OSRV secured the boom pennant line to a stinger (a strong point connected to the ship that takes the strain of the boom) at the stern ramp. At that time, the 660-foot-long boom was trailing straight behind the OSRV, and the bow of *MSRC 8-1* was oriented in the same direction as the ship, both bow into the current. The master then authorized the *MSRC 8-1* crew to commence towing the boom into the J-configuration.



*MSRC 8-1* at 1031, downriver from the *Louisiana Responder* with the boom in tow. (Source: BSEE)

The *MSRC 8-1* began to move directly forward, thus slackening the boom towline. The deckhand then untied the towline from the bitt on the port bow and started walking the line back to the stern of the boat down the port side. Both the master and chief mate, who were observing the exercise from the *Louisiana Responder* wheelhouse, saw the *MSRC 8-1* turn “a few degrees to port”—in the same direction of the boom towline—which was unexpected. Then, seconds later, about 1038, they saw the *MSRC 8-1* come to starboard at a fast rate of turn, which put the boat perpendicular to the current.

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One of the lead responders, witnessing this from the aft deck of the *Louisiana Responder*, said that the boom towline “snapped at” the deckhand on the *MSRC 8-1*, and the master observed the deckhand drop the towline and run into the cabin of the boat. The boat drifted back with the current until the boom towline, which was now tending directly off the port side of the *MSRC 8-1*, took up tension on the H-bitt. The boat then rolled over on its port side, prompting the chief mate to run down to the port side rescue boat station on deck one of the *Louisiana Responder* in anticipation of a man overboard. The master said that the boat appeared to come ahead as it was rolling, and he grabbed the radio and shouted, “cut the line, cut the line, cut the line... Munson boat cut the line.” The master did not see or hear any response to his communication. The *MSRC 8-1* next rolled to starboard, rolled back to port, rolled to starboard again, and then rolled further onto its port side, where it remained for about a second, before rolling over completely upside down.

From the back deck of the *Louisiana Responder*, the senior master responder and BSEE observer had witnessed the same sequence of events with the *MSRC 8-1*, noting that once the deckhand removed the line from the port bow bitt, the boat fell off “a little.” The BSEE observer added that she saw black smoke come from the vessel as it rolled over. One of the lead responders, describing the capsizing sequence to investigators, stated, “it was like 45 seconds; like the boat seesawed, it took on water, and then it’s like it rolled to its port side.” As summarized by the master, once the boat was perpendicular to the current, it was pushed back by the current and the boom towline became “taut;” the boat began to roll, and “it looked like [the *MSRC 8-1* operator] tried to come ahead and to the port some... But when they did that, you could see it start to roll more.” With every roll, the boat reached a greater angle to port and a lesser angle back to starboard, until it flipped over to port.

Immediately after the boat capsized, about 1039, the master sounded the man overboard alarm. The master then informed the Coast Guard on very high frequency (VHF) radio channel 16 about the capsizing. Within 3–4 minutes of the man overboard announcement, the *Louisiana Responder* rescue boat was launched with two able seamen (ABs) as crew, and the boat headed toward the *MSRC 8-1*. The *MSRC 8-1* was floating upside down about 760 feet away from the ship’s stern, still attached to the boom towline at its H-bitt. When the rescue boat reached the overturned boat, one of the ABs tapped on the hull. The ABs heard the operator, near the bow, stating, “I’m here,” and the deckhand, further aft, screaming. The AB communicated back to the master that both crewmembers were still alive inside. Yelling through the hull, they asked the operator if the deckhand was in the same space as him and he stated no, and that he could not find her.

The strong current, cold water, and poor visibility in the water prevented the ABs from diving under to attempt a rescue. Instead, they attempted to tow the *MSRC 8-1* back to the *Louisiana Responder* with a rope that they had tied off to the bottom rail at the stern of the overturned boat. However, they found that the rescue boat could not move the *MSRC 8-1* against the current.

Via radio, the master, chief mate, and rescue boat ABs discussed options to rescue the two trapped crewmembers and agreed on a plan to pull the overturned *MSRC 8-1* to the stern of the *Louisiana Responder* using the boom and towline. Once close enough, the plan was to use the crane on the port stern of the *Louisiana Responder* to hoist the boat out of the water or, at the least, keep the boat from sinking completely until the crew could be rescued. The responders on the aft

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deck of the *Louisiana Responder* connected the ship's end of the oil spill boom to the hydraulic reel and, at 1045, began heaving in the boom.

Upon receiving the *Louisiana Responder* master's VHF call, Coast Guard Sector New Orleans dispatched the 45-foot, twin waterjet-propulsion response boat *CG 45707* from Coast Guard Station Venice, located about 8 miles downriver. The boat got under way with a crew of four at 1050 and headed upriver to the reported location of the *Louisiana Responder*.

About 1052, the master of the *Louisiana Responder* was informed by the AB in the rescue boat that the deckhand could no longer be heard. Four minutes later, an Associated Branch Pilots of New Orleans pilot boat operated by an apprentice pilot arrived on scene to help. As the boat approached from downriver, the apprentice pilot and a deckhand aboard the pilot boat looked for any person in the water but saw no one.

While returning from a training mission in the Gulf of Mexico, the crew of Coast Guard helicopter 6559 had overheard the VHF radio distress call from the *Louisiana Responder* and diverted to the accident location, arriving on scene at 1057. About 3–4 minutes later, a rescue swimmer was lowered to the aft deck of the pilot boat. The *Louisiana Responder* rescue boat picked up the rescue swimmer from the pilot boat and proceeded to the overturned *MSRC 8-1*. Leaving the rescue swimmer on scene, the Coast Guard helicopter departed the area to refuel at a facility about 2 miles upriver, while the pilot boat moved to a position about a mile downriver to search for any debris or persons.

About the same time that the rescue swimmer was being lowered to the pilot boat, *CG 45707* was approaching from downriver, reporting on scene at 1102. From the main deck of the *Louisiana Responder*, the senior master responder estimated that about half of the boom had been reeled back on board the ship at the time the Coast Guard response boat arrived.

On board the rescue boat, the ABs briefed the rescue swimmer about the two people trapped inside the *MSRC 8-1*, the location of the doors and windows on the boat, and the plan to reel the boat back to the OSRV and hoist it up. The rescue swimmer noted that the orientation of the overturned boat at the time was with the stern facing upriver (towards the *Louisiana Responder*). The rescue swimmer boarded the overturned boat after securing two safety lines between his harness and the rescue boat. Then, about 1105, he got in the “exceptionally cold” 43-degree-F water between the rescue boat and the overturned boat. (Because the training mission he had been on was conducted in the estimated 65-degree-F waters of the Gulf of Mexico, the swimmer was wearing a wetsuit ensemble instead of a dry suit, which would normally be worn in the temperatures experienced in the river during the accident.)

The rescue swimmer went under the water to try to find the door to the cabin of the boat, but was not able to see anything, stating that it was like “swimming in coffee” and that the current was “raging.” The rescue swimmer told investigators that Coast Guard policy does not allow for them to swim “into” a capsized vessel, but they can swim underneath it while maintaining a grasp on a reference point on the outside of the boat. He was able to maintain a hand hold on a bitt on the side of the boat and made several attempts to feel for a door handle or window. Not finding anything, he crawled back onto the hull of the overturned *MSRC 8-1*. He knocked on the hull, and there was an immediate knock back from the trapped operator. Shouting through the hull, the operator stated that he did not know where he was inside the boat, that it was dark, and that the



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deckhand was not in there with him. The rescue swimmer told the man to follow his knocks on the hull back to the area where the cabin door was located. When the operator got to the estimated location of the door, the rescue swimmer got back into the water and reached deep into the boat. However, he was still not able to locate the operator.

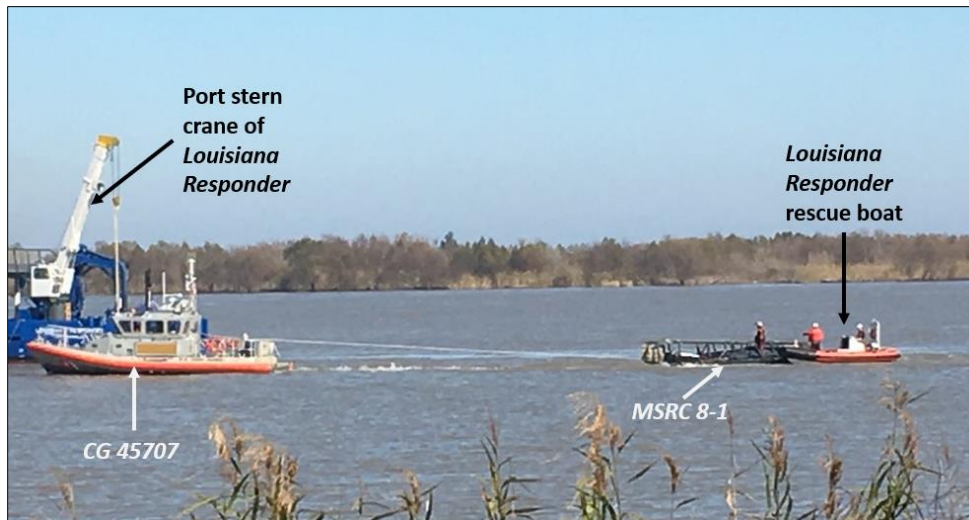
The rescue swimmer's concern about the danger of the situation increased considering the strength of the current, the instability of the overturned boat, and the lack of visibility under the water. He also recalled that the water was so cold that it hampered his ability to hold his breath. Consequently, he once again climbed back up onto the hull of the *MSRC 8-1* while efforts to pull the boat back to the *Louisiana Responder* continued.

As the *MSRC 8-1* was pulled closer to the stern of the *Louisiana Responder*, it became increasingly difficult to pull it in with the boom alone. At 1108, the master of the *Louisiana Responder* radioed *CG 45707* to request assistance in towing the *MSRC 8-1* to the OSRV. In response, the crew of *CG 45707* worked with the *Louisiana Responder* rescue boat crew to attach a line between the Coast Guard boat and the aftmost transverse cross rail between the overturned *MSRC 8-1*'s rudders. The coxswain of *CG 45707* briefed his crew to have a knife ready and to immediately cut the towline if the *MSRC 8-1* sank.

*CG 45707* started to pull slowly on the *MSRC 8-1*, but the rescue swimmer—who was back in the water and hanging onto the *MSRC 8-1* on the downriver side—noticed that waterjet wash from *CG 45707* was flowing into the *MSRC 8-1* and over the boat's stern section, making the stern submerge deeper into the water. The rescue swimmer described the overturned boat starting to “fishtail” before rolling away from him. At the same time, air bubbles came out from the boat underneath him. The swimmer climbed on top of the *MSRC 8-1* and yelled that everyone needed to stop because air was coming out of the overturned boat. In response, the coxswain of *CG 45707* decreased thrust, causing the boat to drift down towards the *MSRC 8-1*. Upon seeing *CG 45707* drifting towards them, the rescue boat moved out of the way. The rescue swimmer, still attached by a line to the rescue boat, was pulled off the *MSRC 8-1* into the water. He disconnected himself from the line and free floated down to the rescue boat, where he grabbed onto the man ropes and was dragged back to the *MSRC 8-1*. He then climbed back onto the workboat's hull. The *CG 45707* coxswain increased thrust to keep from drifting into the overturned *MSRC 8-1* and to take up tension on the towline.

After returning the rescue swimmer to the *MSRC 8-1*, the rescue boat moved into position downriver of the *MSRC 8-1* and began to push on the overturned boat, which, according to one of the ABs, “seemed to work” in helping to get the overturned boat moving again, but “not much.” The ABs in the rescue boat saw that the *MSRC 8-1* continued to sink deeper in the water throughout the duration of time that they were with the overturned boat. According to a crewmember tending the towline on *CG 45707*, every time they put greater tension on their towline, the stern of the *MSRC 8-1* would “dip a little bit.” Consequently, they let the *Louisiana Responder* pull with greater force, while the towline from *CG 45707* was kept under enough tension to stabilize the *MSRC 8-1* and prevent it from turning sideways. A *CG 45707* crewmember said that he and the other crewmembers knew that if the *MSRC 8-1* turned sideways to the current, it would roll over and sink.

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Overtuned *MSRC 8-1* under tow by the boom line from the *Louisiana Responder's* hydraulic reel and by *CG 45707*. The *Louisiana Responder* rescue boat is alongside the *MSRC 8-1*. (Source: rescue operation witness)

The responders were able to retrieve all 660 feet of boom back on board the *Louisiana Responder*, but the end connector caught on the port corner of the stern ramp, preventing them from reeling in the boom towline. About that time, the stern of the *Louisiana Responder*, still at anchor, started to swing to the east (toward the left descending bank). The master recalled that a request was made to him to maneuver the stern of the *Louisiana Responder* to port (to the west/toward the right descending bank) to help free the end connector. The master stated that the main engines were online and ready for use, but he was concerned that propwash from the OSRV would flow into the *MSRC 8-1*. Thus, he declined the request to maneuver the vessel. The master told investigators that he did not use the engines at any time during the boom deployment or the efforts to pull the *MSRC 8-1* back to the ship.

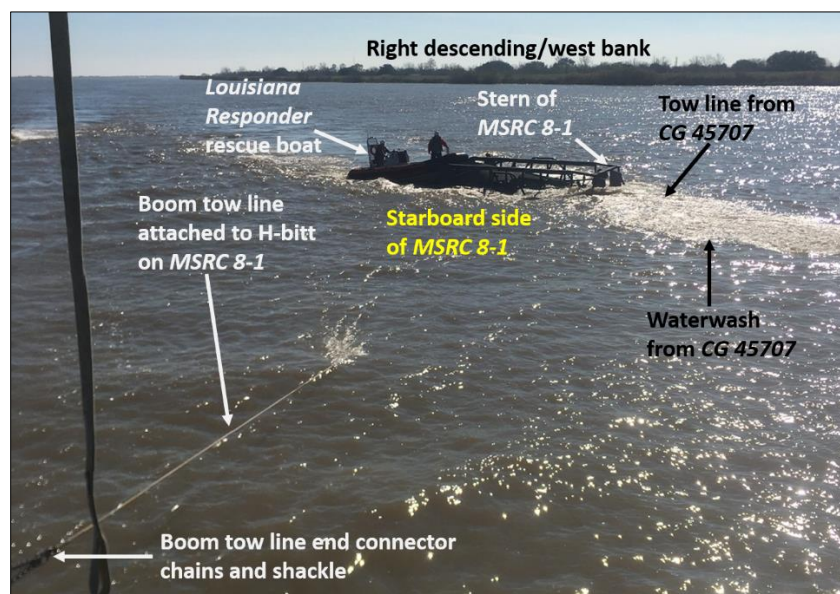


Photo taken at 1119 from the cab of the crane on the port stern of the *Louisiana Responder*. Note the waterwash from *CG 45707* and the combined current flow over the stern of the *MSRC 8-1*. (Source: *MSRC* crewmember)

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At 1118, the coxswain of *CG 45707* radioed the master on the *Louisiana Responder* and told him “we are not moving this boat at all; we’re going to have to figure something else out.” Less than a minute later, the master radioed the apprentice pilot on the pilot boat and asked him to use his boat to push the *Louisiana Responder*’s stern to port. The apprentice pilot agreed, and, about 1120, the pilot boat maneuvered up to the starboard quarter and started pushing. The *Louisiana Responder* moved slowly to port, but the boom connector remained caught on the corner of the stern ramp.

Back on top of the *MSRC 8-1*, the rescue swimmer stated that the *MSRC 8-1* started to again fishtail in a lateral motion, which he surmised was from the underwater section of the overturned boat catching the current. The boat started to roll again with the starboard deck edge of the boat breaking the surface of the water. On *CG 45707*, one of the crewmembers on deck recalled hearing a “pop,” seeing the *MSRC 8-1* start to move “sideways,” and observing the ABs in the rescue boat waving their hands and shouting “all stop!” At 1121, the master also observed the *MSRC 8-1* begin to roll over and announced over the VHF radio, “everybody all stop; all stop,” followed by “the Munson boat is free guys – the line popped – it is no longer attached.” The pilot boat ceased pushing at the starboard stern of the *Louisiana Responder*. On *CG 45707*, the coxswain reduced power and the crewmember tending the towline began to slacken it before hearing another “pop.” He described both as sounding metallic and coming from the direction of the *Louisiana Responder*. Immediately after reducing thrust, *CG 45707* began to again drift down toward the *MSRC 8-1*. With the boom towline no longer holding the *MSRC 8-1*, the workboat began to drift in the current. In response, the rescue boat stopped pushing.

The *MSRC 8-1* continued to roll to about perpendicular, momentarily exposing its starboard side, and changed in orientation on the surface with the bow facing the stern of the *Louisiana Responder*. A large bubble of air exited the overturned vessel, and the stern started to quickly sink. As the boat sank deeper, the rescue swimmer moved to the forward end of the overturned boat and held on to the rails at the bow until they disappeared under the water. He then let go. The time of sinking was estimated to be 1122.

On *CG 45707*, the coxswain ordered the towline to the *MSRC 8-1* cut. The rescue swimmer was then pulled out of the water by the rescue boat. About the same time, Coast Guard helicopter 6559 lifted off from the refueling facility en route back to the accident site. About 1145, the Coast Guard helicopter recovered the rescue swimmer from the deck of *CG 45707*. The helicopter remained on scene to conduct search patterns for about 10 minutes before returning to base.

On the back deck of the *Louisiana Responder*, the responders heaved in the boom towline, which they discovered was intact and not broken or cut. (Investigators later examined the boom towline and found no visible signs of damage.)

Search efforts for the missing responders continued after the *MSRC 8-1* sank. In total, the Coast Guard searched 133 square miles using six different Coast Guard assets. In addition to the Coast Guard assets, a Plaquemines Parrish Sheriff’s helicopter, the Branch pilot boat, and a Venice Harbor Port Authority boat also assisted in the search. The inflatable lifejacket belonging to the deckhand was found downriver (although the deckhand was last witnessed wearing a floatation coat, she also had an inflatable lifejacket on board the *MSRC 8-1*), as were both the operator’s and

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the deckhand's helmets. The search for the two missing persons continued until 1537 on January 17.

### Additional Information

**Deployment Exercises.** The master of the *Louisiana Responder* told investigators that the OSRV conducted boom deployment exercises once or twice a year in the Gulf of Mexico, but most of the training exercises were conducted at the Boothville Anchorage. MSRC management confirmed that exercises were primarily done in the river because of the proximity to the dock and the facilities at Fort Jackson. In order to proceed offshore for a boom deployment exercise, it would take 6–7 hours to get out and back, not including the time to conduct the exercise. Per the ship's certificate of inspection issued by the Coast Guard, an additional licensed deck officer and an AB would be required for trips greater than 16 hours.

The master said that during previous exercises there had been occasions when the boom was deployed without the J-configuration and instances when the boom was let go by the workboat because of the river current. One of the lead responders stated that it was constantly stressed that if it was not safe to make the J-configuration, then they were told to “drop it” and “don't risk it.” But the master told investigators that, on the day of the accident, there was nothing out of the ordinary related to the river conditions that had not been experienced in the past. He said that, a week prior to the accident, the responders on the *S.T. Benz Responder* had carried out the same exercise at the same location under the same river current conditions, without any problems.

MSRC maintains a near miss and incident reporting and tracking database, and, according to company management, in their 28 years of operation there were no records of any accidents or incidents involving its 32-foot Munson workboats or their operation. The senior master responder said there were no mechanical problems or issues with *MSRC 8-1*. Further, the *Louisiana Responder* master reported that there were no technical problems with any machinery or equipment on board the OSRV on the day of the accident.

***MSRC 8-1 Examination.*** The *MSRC 8-1* was salvaged on January 18 and transported to an MSRC facility in Lake Charles, Louisiana. Upon initial examination, Coast Guard investigators found the port and starboard sliding doors to the cabin in the closed position (although the port sliding door was last seen open before the vessel capsized), and the port side sliding window was in the open position. All other windows were found in the closed position. None of the cabin windows were broken at the time of recovery. At the control console inside the cabin, the port engine propulsion control lever was found in the full astern position while the starboard control lever was in the engaged astern position (dead slow astern). Both rudders were deflected to about 10 degrees to starboard. Steering gear and linkages were visually inspected and showed no signs of damage. There was no evidence of any propeller fouling or underwater hull damage.

Inside the main cabin, there was no appearance of any anomalies or damage related to controls for engine or rudder. Switches and levers were examined and found to be in the configuration for normal operation. The starboard side sliding door, once cleared of debris and mud, operated properly, as did the port side door.

## Capsizing and Sinking of Workboat *MSRC 8-1*



Cabin and control console of the *MSRC 8-1* postaccident. The red rectangle indicates the position of the propulsion control levers at the time the vessel was recovered: full astern on the port engine and engaged astern on the starboard. The inset shows the crawl space below the cabin where the operator was later found, as viewed through the opened access cover directly behind the helm chair. (Source: Coast Guard)

The engine room of *MSRC 8-1* was examined, and there were no signs of sooting, fire damage, or activation of the fixed fire extinguishing system. There were no visible signs of failure of either of the diesel engines, but an internal engine teardown and examination was not conducted. The linkages between the throttle controls and the engines were checked, and there was no measured or visual indication of any damage or separation of the linkages.

The remains of the operator were found in the crawl space beneath the main deck of the cabin. The operator's handheld radio, flotation coat, and inflatable personal flotation device (PFD) were found inside the cabin and not physically on him (the operator was last seen wearing an inflatable PFD). At the time the *MSRC 8-1* was put into the water, the deckhand had an orange flotation coat on (but also had her inflatable PFD on board). When both the operator's and deckhand's inflatable PFDs were examined, the automatic inflator indicators on both showed that they had been activated. MSRC's policy required PFDs be worn when operating or riding any small boat.

**Autopsy and Toxicology.** The operator, aged 48, died in the accident. At the request of the Plaquemines County Coroner, an autopsy was performed by the Jefferson Parish Forensics Center in Harvey, Louisiana. The cause of death was drowning, and the manner of death was accidental. Toxicology testing specimens from the operator were negative for alcohol and drugs of abuse.

The deckhand, aged 24, has not been found as of the date of this report. The Coast Guard issued a letter of presumed death on January 23, 2019.

## Capsizing and Sinking of Workboat *MSRC 8-1*

**Personnel training and experience.** Other than medical suitability and physical ability, there were no pre-employment requirements for an entry level responder to be hired at MSRC. All training of responders for their specific duties was done in-house through on-the-job peer/mentor training, safety meetings, exercises, drills, and instructor and web-based training. MSRC managers explained that training for responders in workboat operations was mostly hands-on. Newly hired employees would be placed on board workboats for a “few deployments” to be trained by another responder before being permitted to work as a deckhand. Boat handling training for deckhands would commonly occur after the boat was deployed in the water while waiting for the boom to be prepared. The company kept records of employee training and experience on a training report (the same form as the safety briefing form) and in each employee’s annual evaluations.

The *MSRC 8-1* operator had been employed with MSRC as a responder since June of 2010. He held a state of Louisiana boating safety course certificate and a water survival with helicopter underwater egress training (HUET) and personnel transfer certificate. Employee evaluations documented that he had been training on company Munson boats since 2011 and was proficient in their operations. Company records showed that he had either operated or trained on Munson boats during five deployment exercises in 2018. His most recent operation of a Munson workboat took place a week earlier, on January 9, 2019, while conducting the monthly deployment exercise from the *S. T. Benz Responder*.

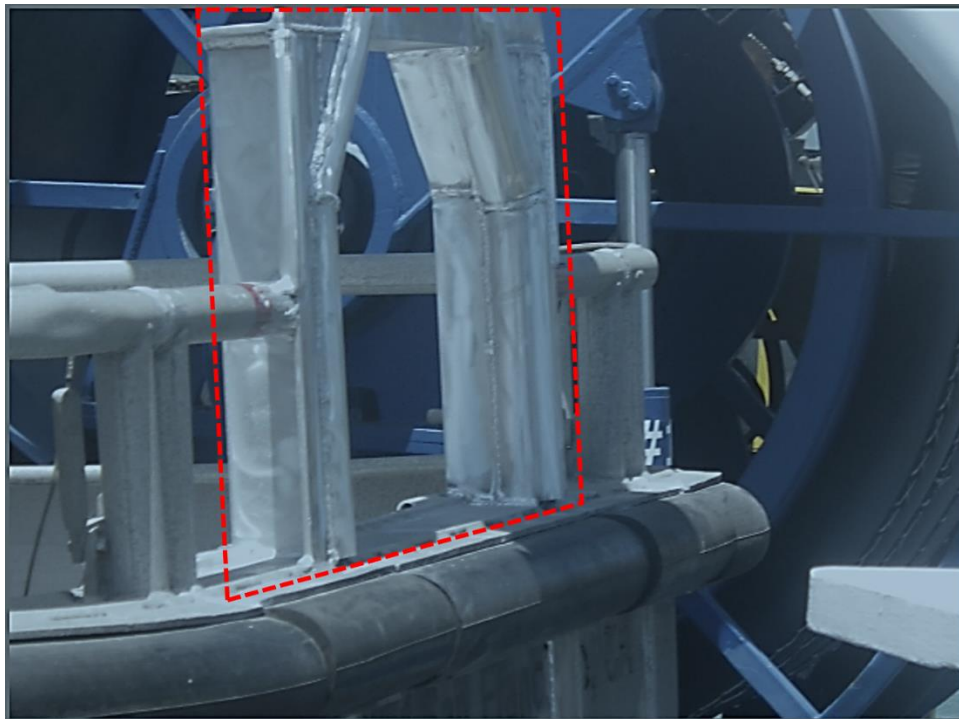
The *MSRC 8-1* deckhand began employment with the company in November of 2017. She had no previous experience as a responder or deckhand. She held a state of Louisiana boating safety course certificate and a water survival with HUET and personnel transfer certificate. According to the deckhand’s supervisor, as a new hire, she had completed a checklist of core competencies for her position. Additionally, she was assigned a mentor to help her with the competency requirements. He noted that with her minimal experience, she progressed well throughout her tenure with the company. Her records indicated that she had started training in the operation and handling of boats from the commencement of her employment. She had a single employee appraisal, which noted that she “continues to learn the operation and handling of boats.” Company records showed that she had either exercised or trained on Munson boats during four deployment exercises in 2018. She had participated in the *S. T. Benz Responder* exercise the week prior but was not in the Munson boat.

**Coast Guard Towing of Overturned Vessels.** While Coast Guard policy allows boats that are in distress to be towed, the coxswain of *CG 45707* explained that Coast Guard vessels normally do not tow overturned boats because of the risk that the stricken vessel may sink and drag down or damage the Coast Guard vessel. However, the coxswain stated that he made a judgement call to assist the efforts to recover the *MSRC 8-1* rather than stand by and do nothing. Prior to taking the *MSRC 8-1* in tow, he communicated his intentions to the Coast Guard Sector New Orleans command center and met no objections.

**Company Actions Since Accident.** Following the accident, MSRC conducted an analysis to determine lessons learned and any necessary changes to procedures or to the equipment configuration. The company determined that the “taut towline while workboat was broadside to the current tripped and capsized the boat.” (Tripping is the effect when the force acted on the vessel by its tow overcomes the buoyant forces acting on the vessel.) As a result of the analysis, the company began modifying each of its Munson boats by installing a towline guide on the stern and a buoyancy collar at the waterline. The towline guide is a deck fitting that the towline is passed

## Capsizing and Sinking of Workboat *MSRC 8-1*

through before being secured to the H-bitt. It reduces the capsizing hazard by moving the pivot point of the tow force aft, which allows the vessel to swing away if caught in a current. The guide also provides the operator a visual indication (the sides of the guide) when the towline is near the recommended limits for the angle of the tow relative to dead astern. The buoyancy collar is designed to limit heeling when an athwartships force is applied, improving the vessel's ability to right itself while increasing time for the vessel to swing. In addition to these workboat modifications, the company stated that it is conducting risk assessments of its field operations, enhancing procedures, and training and documenting the enhanced procedures in its safety management systems. Further, the company is sharing its lessons learned with other industry participants who perform similar operations. Full implementation of the safety enhancements is expected to be completed in mid-2020.



**Towline guide, as outlined in red, installed on a MSRC Munson workboat's transom following the accident. (Source: MSRC)**

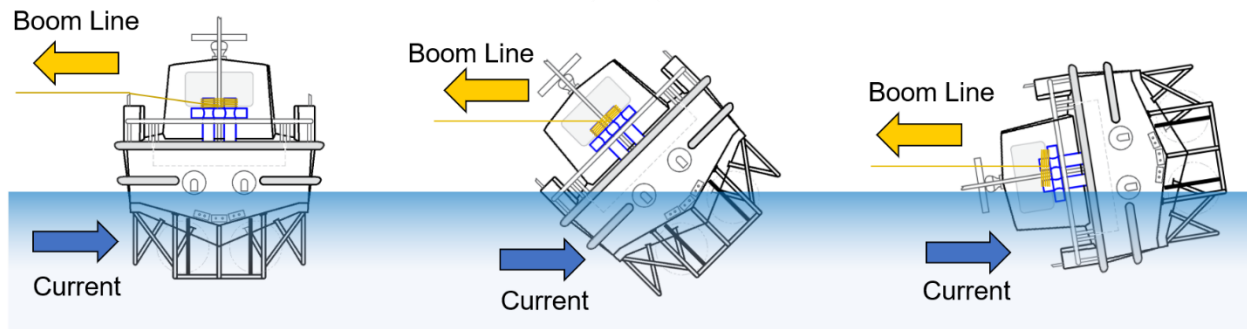
### Analysis

**Capsizing and Sinking.** There were no reports of any wake or any large vessels in the immediate vicinity of the *Louisiana Responder* at the time the *MSRC 8-1* capsized and no evidence of any propeller or rudder fouling from the boom towline or debris/drift in the water. Further, there was no evidence of the operator of the *MSRC 8-1* being under the influence of any alcohol or drugs of abuse. Therefore, the wake from another vessel, fouling of the propellers and rudders, damage from surface or subsurface debris, or operator impairment are not considered to be causal to the capsizing and subsequent sinking of the *MSRC 8-1*.

The H-bitt on the *MSRC 8-1* was located just aft of midship above the vessel's center of gravity, and the boom towline was made up to the top of the bitt. Once the *MSRC 8-1* was perpendicular to the current, the boom towline was tending directly off the boat's port side from the H-bitt with tension on it. The vessel's operating manual noted that the vessel was at risk of

## Capsizing and Sinking of Workboat *MSRC 8-1*

capsizing with a towline tending as little as 10 degrees off centerline dead astern. By comparison, during the accident, the boom towline was tending about 90 degrees off centerline. The static force that the boom towline exerted on the H-bitt, combined with the force of the current broadside to the *MSRC 8-1*'s underwater hull, attached framework, and large rudders, created a heeling moment, which rolled the boat to port quickly, overcoming its inherent stability and capsizing it. Although the boom towline was rigged for ease of release, the speed of the capsizing and the tension on the line likely prevented the crew from releasing it.



**The forces of the current and boom towline acting to capsize the *MSRC 8-1*.**

When operating with a boom in strong current forces, a loss of power to even one engine would have put the vessel in a vulnerable situation. However, there were no reported conditions or problems with the *MSRC 8-1* prior to the accident, and the vessel operated normally during the payout of the oil spill boom. A post casualty examination of the boat did not reveal any mechanical anomalies with its steering and propulsion, and the operator did not communicate any problems prior to the capsizing. Workboat operators were required to check fuel quantities prior to launching, and an oil sheen on the water following the sinking indicates that it is unlikely that the vessel ran out of fuel. (No postaccident fuel samples were available to analyze for fuel contamination.) MSRC maintained scheduled planned maintenance and checks of their workboat fleet and oil spill response equipment, and all maintenance and checks on the *MSRC 8-1* were up to date on the accident day. Although a teardown and full examination of both engines and internal components were not carried out, based on the available evidence, it is unlikely that a mechanical failure was causal to the capsizing and sinking.

Neither of the crewmembers on the *MSRC 8-1* survived the capsizing and sinking, and thus there is no account of the events or helm and propulsion orders given before the vessel capsized. Witness accounts all describe the deployment of the oil spill boom as normal up until the time that the *MSRC 8-1* moved ahead and the deckhand removed the slackened boom towline from the forward port bitt. The operator of the *MSRC 8-1* was considered by the company to be adequately trained and experienced in the operation of the vessel in the river current conditions experienced on that day. Therefore, the circumstances for which the *MSRC 8-1* turned perpendicular to and fell back with the current, with the boom towline under tension and still tethered to the *Louisiana Responder*, are unknown.

MSRC responders were not required to have any pre-employment boat handling experience, and training consisted of in-house on-the-job and exercise-based instruction from senior and experienced responders. Employees were required to complete an online state boating safety course that was general in nature and not specific to the workboat operations carried out by



## Capsizing and Sinking of Workboat *MSRC 8-1*

the company. There were no regulatory requirements for certification of either deckhands or operators on the 32-foot workboats nor any requirements to keep training records. There were no company-documented proficiency, competency, or performance and knowledge checks in place beyond the on-the-job peer and exercise-based training. By comparison, company training for skills such as forklift operator, crane operator, and truck and trailer driver included proficiency tests with detailed performance-based tasks to be completed to the satisfaction of an evaluator. While some of these examples are regulated under the Occupational Safety and Health Administration (OSHA) or have specific training required by insurance providers, they represent skills as complex and potentially dangerous as operating the 32-foot, twin-engine, 640-horsepower workboat conducting towing operations in varying types of environmental conditions. While company management considered the operator and deckhand of the *MSRC 8-1* trained and proficient, there was little detail as to what training was conducted and what performance criteria was used to evaluate personnel in order to make such a proficiency determination.

Because of the current in the river on the accident day, any loss of control or unintended maneuvering of the boat while tethered to the OSRV by the boom risked capsizing the vessel. The responders had a procedure for releasing the boom towline in an emergency, but the release required slack in the line. At the time of the accident, the boom and towline were fully extended behind the *Louisiana Responder* and the *MSRC 8-1* had just begun to come ahead, and thus the towline immediately came under tension when the boat turned perpendicular to the strong current. Although the exercise procedure had been conducted numerous times without incident during previous exercises, the NTSB believes that, with the arrangement of the towline and H-bitt on the *MSRC 8-1* at the time of the accident, the procedure for transitioning the boom from directly astern of the OSRV into the J-configuration was inherently dangerous in the prevailing current. Following its postaccident analysis, MSRC addressed the risk of capsizing by modifying its 32-foot Munson workboats with towline stern guides and hull buoyancy collars. The NTSB believes that these modifications will reduce the risk of capsizing during the J-configuration procedure.

MSRC company policies, the use of checklists and standard procedures, and supervisor safety leadership indicated that the company had an established safety culture amongst its vessel crews and responders. On the day of the accident, a briefing was held for all persons involved in the exercise, and all attendees, including non-company personnel there to witness the exercise, understood that they had stop work authority if an unsafe condition arose. All company employees interviewed were aware of and believed that they could raise safety concerns without any negative feedback or penalty for doing so. However, despite these safety policies and the safety culture that encouraged stoppage of work should problems arise, the responder team did not recognize the dangerous situation that existed on the accident date.

**Rescue Operations.** Witnesses reported that the deckhand entered the cabin of *MSRC 8-1*, likely startled when the boom towline came under tension, and stated that the *MSRC 8-1* capsized in seconds shortly thereafter. With the short time it took for the *MSRC 8-1* to roll to port and capsize, the operator of the boat was likely still at the helm controls trying to use propulsion and steering to recover. Witness photos indicate that the starboard side door was closed to the cabin, so as the *MSRC 8-1* rolled on its side to port, it would have been difficult for both occupants to open the starboard door (facing up). The port side door (facing down) was open at the time of the accident, based on witness accounts, and rapid water ingress through the port door would have made it difficult for the occupants to escape in that direction.

## Capsizing and Sinking of Workboat *MSRC 8-1*

The effect of the current on the underwater section of the *MSRC 8-1* complicated efforts to get the overturned boat back to the stern of the *Louisiana Responder*. The strength, direction, and effects of the river current, combined with the waterwash from *CG 45707*, caused very dynamic and changing conditions. The rescue swimmer described the lateral fishtailing motion and the rolls of the overturned vessel when it was at its closest point to the *Louisiana Responder*. On the day of the accident, the *Louisiana Responder*'s draft was about 13 feet, while the overturned *MSRC 8-1* box-shaped cabin drew an estimated 9 feet (not including the radar mast). As the *MSRC 8-1* was pulled closer to the *Louisiana Responder* during the rescue attempt, the underwater section of the *MSRC 8-1* came into the current disturbed by the OSRV, thus subjecting the boat to turbulent eddies. It is likely that the dynamic flow of water around the *MSRC 8-1* and the water wash from *CG 45707* exacerbated the motion and changed the orientation of *MSRC 8-1*, thus causing the boom towline to fall off the H-bitt.

*CG 45707* took the capsized *MSRC 8-1* under tow to assist in efforts to bring the vessel within reach of the crane on the *Louisiana Responder*. Although the three crewmembers required to operate the boat were qualified and had trained in providing towing assistance (the additional fourth crewmember was there for qualification and training), the Coast Guard normally does not tow overturned boats due to the risk associated with the sinking of the towed vessel. There was no training or procedures for the towing of the overturned 32-foot workboat in strong and dynamic current conditions. However, given the urgency of the situation, the coxswain opted to provide towing assistance when requested, after he had communicated his intent to the Coast Guard Sector New Orleans command center.

Witness accounts and photos indicate that waterwash from *CG 45707*'s water propulsion system caused water to enter and flow over the overturned hull. After extending the tow and maintaining the minimum power possible, the coxswain determined that the towing effort was not effective. He recommended to the master of the *Louisiana Responder* that another means of getting the *MSRC 8-1* closer to the ship be determined, but by that time the *MSRC 8-1* had begun to exhibit unpredictable movements. As previously noted, the boom towline ultimately released from the *MSRC 8-1*, and the vessel sank. When examined after the accident, the boom towline showed no damage. Therefore, the efforts of the crew of the *CG 45707* to assist in the attempted rescue of the crew of the *MSRC 8-1* in dynamic and difficult conditions were reasonable and appropriate.

## Probable Cause

The National Transportation Safety Board determines the probable cause of the capsizing of the workboat *MSRC 8-1* was the boat becoming perpendicular to a strong river current, for an undetermined reason, while tethered to the oil spill response vessel *Louisiana Responder*. Contributing to the accident was the unforeseen risk associated with conducting the exercise in a strong current, which also contributed to the severity of the outcome by hampering rescue efforts.

**Capsizing and Sinking of Workboat *MSRC 8-1***

**BY THE NATIONAL TRANSPORTATION SAFETY BOARD**

**ROBERT L. SUMWALT, III**  
Chairman

**JENNIFER HOMENDY**  
Member

**BRUCE LANDSBERG**  
Vice Chairman

**MICHAEL GRAHAM**  
Member

**THOMAS CHAPMAN**  
Member

**Adopted: July 2, 2020**

## Capsizing and Sinking of Workboat *MSRC 8-1*

### Vessel Particulars

Vessel	<i>Louisiana Responder</i>	<i>MSRC 8-1</i>
Owner / operator	Marine Spill Response Corporation	Marine Spill Response Corporation
Port of registry	Norfolk, Virginia	Fort Jackson, Louisiana
Flag	United States	United States
Type	Oil spill response vessel	Workboat
Year built	1993	1992
Official number (US)	983115	988146
IMO number	9044657	Not applicable
Construction	Steel	Aluminum
Classification Society	ABS	Not applicable
Length	210 ft (64 m)	32 ft (9.8 m)
Draft	13 ft (4 m)	5 ft (1.5 m)
Beam/width	45 ft (13.7 m)	12 ft (3.7 m)
Tonnage	498 GRT/1,322 GT ITC	12 GRT
Engine power; manufacturer	2 X 1,500 hp (1,118 kW) Caterpillar 3512TA diesel engines, twin screw	2 X 320 hp (239 kW) Caterpillar 3208T diesel engines, twin screw
Persons on board	12 persons	2 persons

**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](http://www.nts.gov) and search for NTSB accident ID DCA19PM014.

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).