



National Transportation Safety Board

Marine Accident Brief

Contact of Tugboat *G.M. McAllister* with NGL Energy Partners Berth

Accident type	Contact	No. DCA19FM053
Vessel name	<i>G.M. McAllister</i>	
Location	St. Juliens Creek Turning Basin, Elizabeth River Southern Branch, Chesapeake, Virginia 36°46.69' N, 076°18.57' W	
Date	September 23, 2019	
Time	About 0657 eastern daylight time (coordinated universal time – 4 hours)	
Injuries	None	
Property damage	\$1.47 million est.	
Environmental damage	None	
Weather	Visibility 10 miles, clear, winds south-southwest at 4 knots; air temperature 63°F, water temperature 77°F, daylight/dawn conditions, begin civil twilight 0628, sunrise 0654. ¹	
Waterway information	The Southern Branch of the Elizabeth River has a controlling channel depth of 36.6 feet, and the channel width from the St. Juliens Creek Turning Basin to Money Point is 780 feet; there was a 0.3 knot ebb current at the time of the accident.	

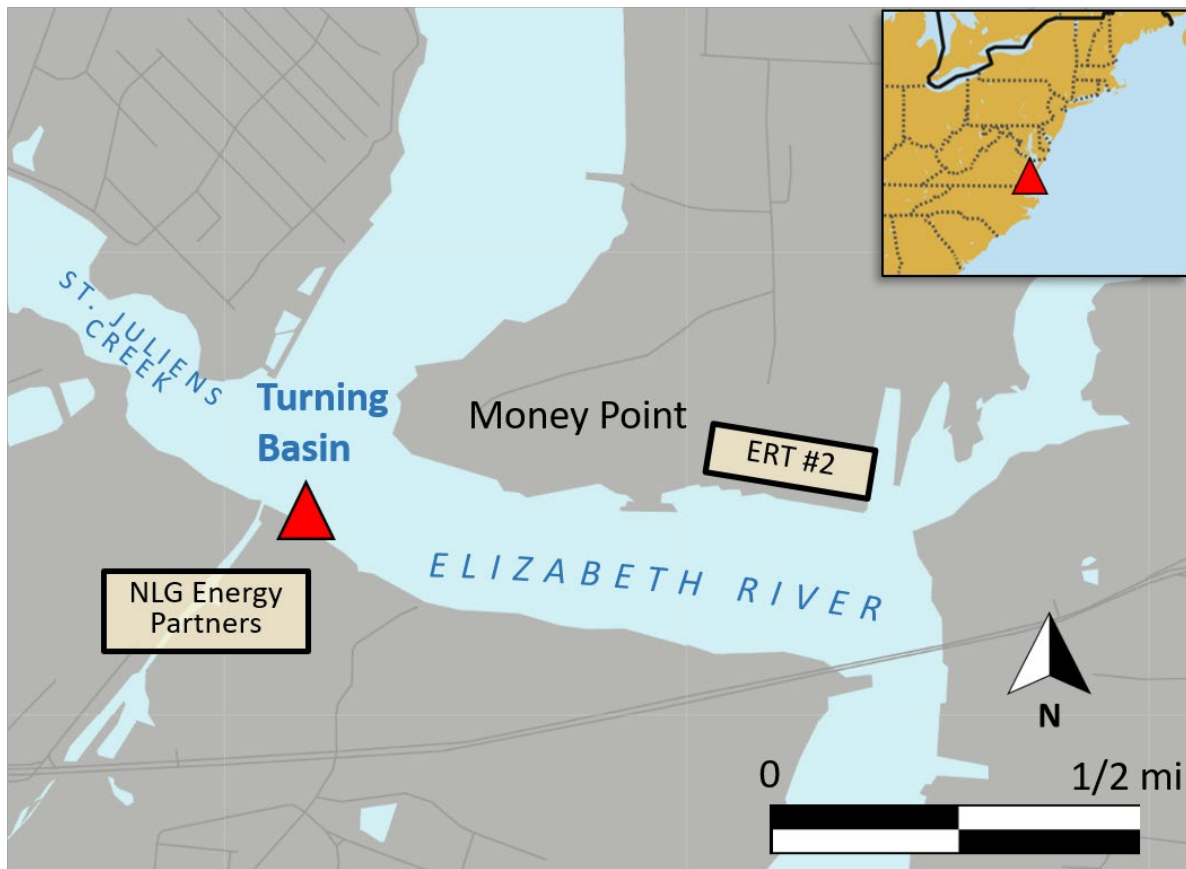
On September 23, 2019, about 0657 local time, the tugboats *G.M. McAllister* and *Nancy McAllister* were assisting the bulk carrier *Ijssel Confidence* on the Southern Branch of the Elizabeth River, in Chesapeake, Virginia. While engaged in turning the bulk carrier, the *G.M. McAllister* contacted the NGL Energy Partners wharf. There were four crewmembers on board the tugboat. The vessel was not damaged and therefore continued the turning maneuver. No pollution or injuries were reported. Damage to the wharf was estimated at \$1.47 million.



G.M. McAllister underway before the accident. (Sources: Marc Piche, www.tugboatinfomation.com)

¹ All miles in this report are are nautical miles (1.15 statute miles).

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Area of accident in Chesapeake, Virginia, where the *G.M. McAllister* contacted the NGL Energy Partners wharf, as indicated by the red triangle. (Background source: Google Maps)

Background

The *G.M. McAllister* was a twin-propeller steel-hulled 4,000-horsepower tugboat fitted with Kort nozzles and flanking rudders.² The *Nancy McAllister* was also a twin-propeller steel-hulled 4,000-horsepower tugboat fitted with Kort nozzles but not with flanking rudders. Both tugs were owned and operated by McAllister Towing and Transportation Company, Inc.

The *Ijssel Confidence* was a five-hatch self-unloading bulk carrier owned by Ijssel Shipping LTD and operated by Hellas Confidence Ship Management. The bulk carrier was flagged in Portugal, classified by Nippon Kaiji Kyokai, and had a crew of 21. At full ahead, the *Ijssel Confidence*'s slow-speed diesel engine directly turned a right-hand turning fixed propeller at 95 rpm, which produced a speed of 11.6 knots in the loaded condition. Half ahead, slow ahead, and dead slow ahead were, respectively, 75 rpm/9.2 knots, 55 rpm/6.4 knots, and 40 rpm/4.1 knots. When going astern, the propeller turned in the opposite (left-hand) direction at the same rpm for ahead speeds.

² A Kort nozzle is a fixed circular duct or shroud that is fitted around the propeller to increase the propeller's efficiency at lower speeds.

Accident Events

On September 20, 2019, the *Ijssel Confidence* arrived from Hamburg, Germany, and docked, port side to, at Kinder Morgan’s Elizabeth River Terminal berth 2 (ERT #2), Chesapeake. On September 23, *Ijssel Confidence*’s main engine, steering gear, navigation equipment, and communication equipment were tested in preparation for the vessel’s undocking and outbound transit to Charleston, South Carolina, to discharge its cargo of fertilizer. The testing was completed at 0552 and logged as in “normal working condition.”

The *Ijssel Confidence* engaged two pilots for the undocking and transit to sea, which was normal practice in this port. The docking pilot would undock and conn the ship from the berth to a place about 5 miles downriver, and the state pilot would conn the ship from that point until it reached the pilot boarding area off of Cape Henry, at the mouth of the Chesapeake Bay. The docking pilot was a member of the Association of Virginia Docking Pilots and had US Coast Guard mariner’s credentials



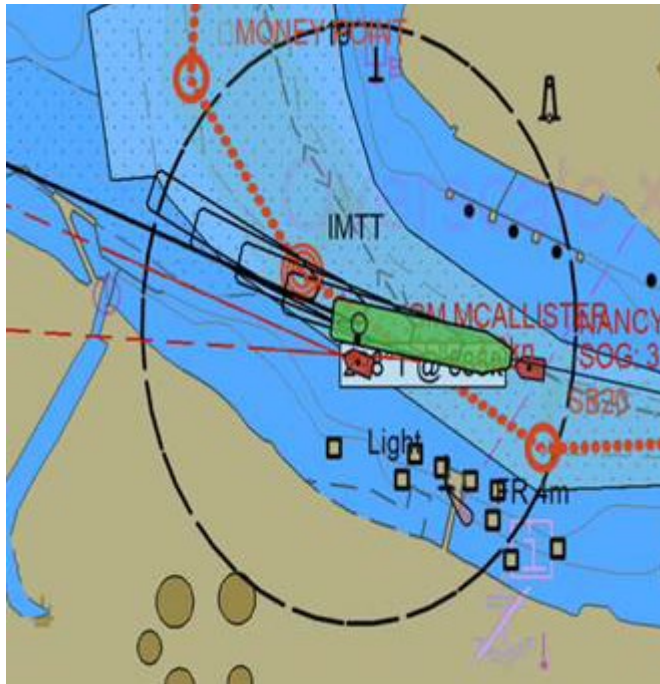
Ijssel Confidence underway before the accident. (Source: Hellas Confidence Ship Management S.A.)

with a federal pilotage endorsement for the area of the river where the accident occurred. The state pilot, a member of the Virginia Pilot Association, held US Coast Guard mariner’s credentials with federal endorsements and a state pilotage endorsement from the Commonwealth of Virginia for the accident area. A state pilot was compulsory for the vessel under Coast Guard regulations.

The docking pilot boarded the ship at 0615, the engines were placed on standby at 0618, and the state pilot boarded at 0620. Seconds after the state pilot reported to the bridge at 0621, he was heard asking the ship’s master if all equipment was in good working order. *G.M. McAllister*’s captain said that he didn’t know the docking pilot’s plan, and investigators did not hear any master/pilot exchange on the VDR, nor did they hear any discussion of the undocking evolution with the tugboat captains, the ship’s master, or the state pilot. By 0625, the *Nancy McAllister* was made fast forward and *G.M. McAllister* was made fast aft. The last line from the bulk carrier was cast off from the terminal at 0630, and, at 0639, the first engine order of dead slow astern was given with the rudder midship.

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The docking pilot told investigators that, after coming off the berth, ships were backed to the west until they were at the turning basin off Money Point, and then they would turn them counterclockwise to align them in the channel outbound; tugs were used to help position the ships in the channel. While the docking pilot worked the forward and after tugboats, the ship proceeded downriver astern, in a general westerly direction, toward the turning basin, with the engine dead slow astern and the rudder midship. AIS and voyage data recorder (VDR) images of the vessel showed the ship remained more toward the northern bank of the river. At 0646:45, the vessel was making a course over ground (COG) of 273 degrees and speed over ground (SOG) of 1.8 knots. At 0650:49, as it approached the area where the river started bending toward the northwest, the vessel's COG was 276 degrees, its engine speed was 41 rpm astern, and its speed over the ground was 2.5 knots.



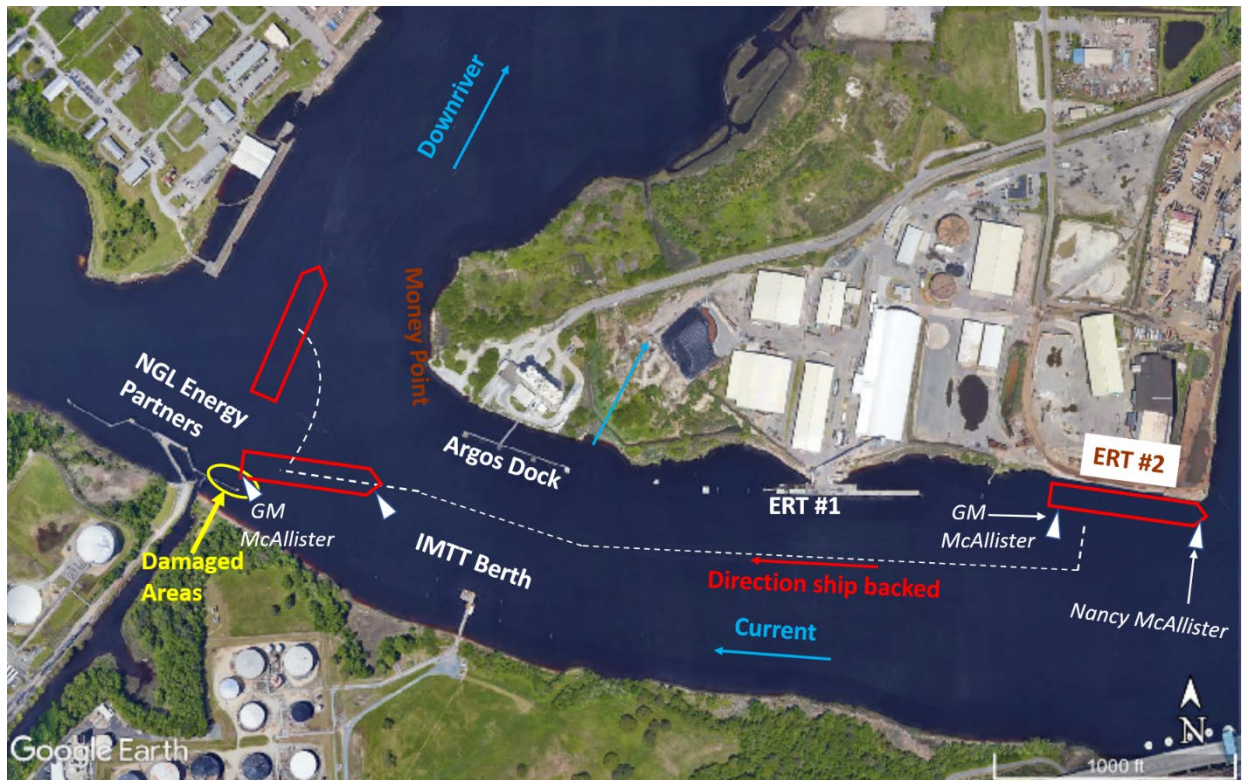
Screen capture from the state pilot's portable pilot unit, based on automated identification system (AIS) input, showing approximate positions of the tugs and *Ijssel Confidence* at 0653.

At 0652:02, when the docking pilot ordered stop engines, the vessel's SOG was 2.9 knots, and its COG was 278.7 degrees. At this time, the *G.M. McAllister* was pushing full ahead in an attempt to push the ship's stern to the north. The docking pilot told investigators that when the vessel wasn't slowing down as much as he liked, he went to the starboard bridge wing and noticed that the *G.M. McAllister* was pushing the ship astern. According to the *G.M. McAllister*'s captain, the docking pilot told him to come to all stop as the vessels approached the NGL Energy Partners (NGLEP) berth, because he was pushing the ship astern (toward the berth). As they came close to the pier, the docking pilot also told the *G.M. McAllister*'s captain to "tuck in alongside." The *G.M. McAllister* captain said he had to twist the tugboat to keep it tucked alongside.³

At 0653:19, the *Ijssel Confidence* reached 3.2 knots, its COG was 287 degrees, and the docking pilot ordered dead slow ahead on the ship's engine; the rudder remained midship. Between 0653:51 and 0654:30, a span of 39 seconds, the docking pilot ordered slow ahead, half ahead, and then full ahead on the ship's engine, and then he ordered hard starboard on the ship's rudder.

³ When tug propellers are operated in opposite directions (one is turning ahead and the other is turning astern) it causes a "twisting" motion to the tug.

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Detailed satellite image of the area where the *G.M. McAllister* contacted the NGL Energy Partners wharf. (Background source: Google Earth, annotated by NTSB)

At 0656:18 the rudder was ordered midship, and at 0656:56 the *G.M. McAllister* contacted a concrete pile of the easternmost mooring dolphin at NGLEP. The docking pilot told investigators that he noticed the tug had tucked in alongside with its bow facing toward the stern of the ship, and he could see propeller wash from the tug, so he again told the tug captain to stop pushing. The *G.M. McAllister*'s captain told investigators that the wash was from the twisting of the tug (using the propellers to remain tucked in), and that, at this point, the tug was not pushing the ship any longer, but rather, the *Ijssel Confidence* was pulling the tug. The docking and state pilots then witnessed the *G.M. McAllister* moving away from the side of the ship toward a perpendicular angle with the ship's hull. When the state pilot asked the docking pilot what the tug was doing, the docking pilot said he didn't know because the last command he gave the *G.M. McAllister* was to go astern or stop.

According to the *G.M. McAllister*'s captain, he was keeping the tug alongside and parallel to the ship by twisting the tug, but as the ship approached the berth structure, his tug's port quarter first hit the piling of the easternmost mooring dolphin and then, when the tug came ahead, struck the walkway between the easternmost mooring dolphin and the next dolphin to the west. Damage to the tug was negligible, but estimated damage to the NGLEP berth was \$1.47 million.

The *Ijssel Confidence* engine was stopped at 0657:03. The vessel had a speed of 0.6 knots and the COG at 093 degrees. The *Ijssel Confidence* completed its counterclockwise turn to port in the turning basin, and it was on a course of 016 degrees at a speed of 1.5 knots about 0706.

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Top: *G.M. McAllister* at the NGL Energy Partners berth immediately after the accident (Source: Master, *Ijssel Confidence*). Bottom left and bottom right: Damaged NGL Energy Partners berth after the accident (Source of right photo: US Coast Guard).

Additional Information

Toxicology results for *Ijssel Confidence* bridge officers and both the state and docking pilot produced negative results, and all involved personnel held appropriate credentials for their positions. Investigators reviewed relevant *Ijssel Confidence* crew's 96-hour work/rest history and found they all had at least 12 hours rest in the past 3 days. The docking pilot's 96-hour work/rest history showed that he obtained 6 hours of sleep on the two nights before the accident. The state pilot and *G.M. McAllister* captain's histories both showed 7 hours for the past three nights.

The docking pilot was an ex-tugboat captain and mate. His previous employer was Moran Towing Corporation, and he started working as an independent docking pilot in 1987. He stated that, during his work as a docking pilot, he had undocked hundreds of ships in the accident area of the river. He also stated that he mostly used Moran tugboats to assist in docking/undocking, but on the accident morning, "Moran had more jobs going than they had tugboats to facilitate those jobs, so they had to hire *McAllister* to help [him] on that job." According to the Moran Transportation website, all tugs of the Moran fleet stationed in the accident area were tractor

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tugboats, which use propulsion systems that can direct thrust 360 degrees. The *G.M. McAllister* and the *Nancy McAllister* had conventional propulsion systems.

The physical layout of the NGL berthing facility included a large concrete structure for ships to rest against and offload cargo. The rest of the NGL berthing facility contained four concrete mooring dolphins, two to the east and two to the west, where ships would attach their lines to safely moor. Wooden walkways connected the mooring dolphins to the large concrete structure, and the large concrete structure was connected to the shore by another concrete structure. The mooring dolphins were supported by steel piles, and the walkways were supported by wooden piles.

Nine other cargo vessels undocked at Kinder Morgan's ERT #1 and ERT #2 between June 2, 2020, and November 6, 2020. All vessels had about the same draft as the *Ijssel Confidence*, and all pivoted in the turning basin off Money Point. Seven of the ships used two tractor tugboats, and two used a single conventional tugboat and one tractor tugboat. (The *Ijssel Confidence* was the only ship to use two conventional tugboats.) Investigators reviewed the tracks taken by these other vessels. The *Ijssel Confidence*'s maximum speed was 3.2 knots. The maximum speeds of the other nine vessels ranged from 1.5 to 3.3 knots, averaging 2.16 knots. Additionally, all of the other ships except one took paths that went either mid-river or toward Money Point to the north. The sole ship that slid to the south, away from Money Point and in the direction of the NGL berthing facility struck by the *G.M. McAllister*, used two tractor tugboats of 6,000 horsepower each.

The captains of the *G.M. McAllister* and the *Nancy McAllister* told investigators that the *Ijssel Confidence* was moving too fast for the tugboats to work effectively. The *G.M. McAllister* captain told investigators that other pilots ask him for distances from objects as the ship approaches them, but this docking pilot did not. The docking pilot told investigators that "I wish he had said[...] I can't work my stern."

Analysis

Ijssel Confidence crew fatigue, drug impairment, and inadequate/improper credentials were ruled out as causative in this accident. Drug impairment and improper credentialing were ruled out for the state and docking pilots, but fatigue could not be ruled out for the docking pilot. Less than 7-8 hours' sleep in any 24-hour period can cause acute fatigue. While the docking pilot had 6 hours' sleep on the two nights before he came aboard the *Ijssel Confidence*, he did not show any indications of fatigue.

The time from when the docking pilot came aboard at 0615 until the time the last line was cast off was a span of 15 minutes, and the docking pilot did not discuss his plan for the undocking evolution with the tugboat captains. While circumstances can change during a particular evolution and the person directing the movement of a vessel needs to be aware of changes to compensate for any adverse effects, all involved should share a mental model of what is supposed to happen. With a shared mental model, those assisting in the evolution, like the tugboat captains and the ship's crew, can provide relevant input to the person directing the movement of the vessel. Because the docking pilot used this type of tugboat less frequently, he should have discussed his plan at the master/pilot exchange and in separate pre-undocking discussions with the tugboat captains.

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Tugboats are used to impart lateral motion to a ship moving at slow speeds through water. A tugboat's propeller thrust is most effectively imparted to the vessel when the tugboat is at a 90-degree angle (perpendicular to the vessel's hull). In practice, the tugboat imparts a portion of its thrust in the general direction of movement of the vessel as well. As the *Ijssel Confidence*'s engine propelled the vessel astern, the tugboats increased its backward acceleration as they tried to keep up with the *Ijssel Confidence*'s motion while keeping contact with the hull.

Compared to the nine recent undockings from the same dock, the *Ijssel Confidence*'s speed exceeded the average speed of the other ships by over a knot. Both tugboat captains stated that the *Ijssel Confidence* was moving too fast for the tugboats to work effectively. In addition, the only vessel with speed similar to the *Ijssel Confidence*, over 3 knots, was using tractor tugs, which are generally accepted as being more maneuverable than tugboats fitted with a conventional-type propulsion system. While the docking pilot predominantly used the more maneuverable Moran tractor tugboats for moving ships, his experience as captain or mate on tugboats was on conventional tugboats, so he should have been aware of their limitations. He should have been aware that the conventional tugboats were less maneuverable than tractor tugboats, but he neglected to take into account the conventional tugboats' reduced effectiveness and the additive effect to the ship's speed. Whatever the cause, the ship's speed made it difficult to effectively use the tugs to position the ship laterally in the waterway.

After the docking pilot ordered the *G.M. McAllister* to tuck in as they approached the pier, the tugboat came forward and returned to a more perpendicular heading. It is unclear from the statements of the witnesses as to why the tugboat did this, but neither the *G.M. McAllister*'s captain nor the docking pilot said the tug had been ordered to do so prior to the dolphin or walkway being struck by the tug.

Investigators also viewed video taken from a camera at NGLEP and noted the positioning of the *G.M. McAllister*, the thrust from the ship, and the 2 movements of the berth about 10 seconds apart. The first movement, which investigators believe was caused by the mooring dolphin strike, occurred just prior to the *G.M. McAllister* coming into the picture, as the tugboat was alongside the hull of the ship. This is consistent with the *G.M. McAllister* captain's statement that he was twisting the tugboat alongside the *Ijssel Confidence* just prior to striking the mooring dolphin. After the apparent strike, increasing slack in the *G.M. McAllister*'s headline indicated that the tugboat did move forward. The *G.M. McAllister* struck the walkway after the ship had placed the tugboat in such a position that the tugboat was caught between the dock and the side of the ship.

The *G.M. McAllister* captain and the docking pilot told investigators that there had been gaps in their communication; had they both communicated better, and had the ship proceeded in a speed more appropriate for the tugboats, this accident could have been avoided.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the contact of the *G.M. McAllister* with the NGL Energy Partners berth was the docking pilot backing down the river toward the turning basin at a speed at which the assist tugboats could not be effectively used. Contributing to the accident was insufficient communication, before and during the maneuver, between the docking pilot and the *G.M. McAllister* captain.

Vessel Particulars

Vessel	<i>G. M. McAllister</i>	<i>Ijssel Confidence</i>
Owner/operator	McAllister Towing and Trans. Co.	Ijssel Confidence LTD
Port of registry	New York, NY	Madeira
Flag	US	Portugal
Type	Towing	Cargo
Year built	1983	2012
Official number (US)	663280	N/A
IMO number	8218902	9604809
Classification society	N/A	NKK
Construction	Steel	Steel
Length	110 ft (33.5 m)	590.5 ft (180.0 m)
Draft	16 ft (4.9 m)	32.4 ft (9.9 m)
Beam/width	33 ft (10.1 m)	97.8 ft (29.8 m)
Gross and/or ITC tonnage	274 GRT	23,264 ITC
Engine power; manufacturer	2 EMD 4,000 hp (2,983 kW); 16-645-E6 diesel engines	1 x 8,958 hp (6,680 kW); Makita Mitsui MAN B&W 6S46MC-C (Mark 7) diesel engine
Persons on board	4	23

NTSB investigators worked closely with our counterparts from Coast Guard Sector Virginia throughout this investigation.

For more details about this accident, visit www.nts.gov and search for NTSB accident ID DCA19FM053.

Issued: November 16, 2020

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*, Section 1131(b)(1). 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*, Section 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*, Section 1154(b).