



National Transportation Safety Board

Marine Accident Brief

Contact of Cruise Ship *Norwegian Epic* with San Juan Cruise Port Pier 3

Accident type	Contact	No. DCA19FM016
Vessel name	<i>Norwegian Epic</i>	
Location	Pier 3 east, Old San Juan Cruise Port, San Juan, Puerto Rico 18°27.58' N, 066°06.67' W	
Date	February 12, 2019	
Time	1724 Atlantic time (coordinated universal time – 4 hours)	
Injuries	None	
Property damage	\$3.7 million est.	
Environmental damage	None	
Weather	Visibility 10 miles, partly cloudy, winds easterly at 11 knots, gusts 21 knots; easterly waves at 2–3 feet, current setting west at 1 knot, air temperature 79°F, water temperature 78°F ¹	
Waterway information	San Juan harbor generally runs in an east to west direction after entering from the Atlantic. The cruise ship piers of Old San Juan are situated at the northern part of the harbor.	

On February 12, 2019, about 1724 local time, the cruise ship *Norwegian Epic* was docking at San Juan Cruise Port, Pier 3 east, in San Juan, Puerto Rico, when the vessel's port bow contacted two of the pier's mooring dolphins. None of the 6,023 persons on board were injured, and there was no reported pollution. Damage to the mooring dolphins and connecting catwalks was estimated at \$3.5 million, and damage to the vessel was estimated at \$200,000.



The *Norwegian Epic* before the accident. (Source: Miami Herald.com)

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

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Area where the *Norwegian Epic* struck Pier 3, as indicated by the red triangle. (Background source: Google Maps)

Background

The 1,080-foot cruise ship *Norwegian Epic* was built at Chantiers L'Atlantique shipyard in Saint-Nazaire, France, delivered to Norwegian Cruise Lines in 2010, and flagged in the Bahamas. The vessel, which was certified by Det Norske Veritas to carry 5,186 passengers and a crew of 1,730, operated in the western Caribbean during the winter cruising season and repositioned to the Mediterranean Sea for the summer cruising season. The vessel had 6 diesel engine-driven generators providing propulsion and electrical power (three 15,288 hp and three 20,384 hp). The vessel was propelled by two fixed-pitch propellers, each driven by a 32,184-hp electric (shaft) motor. The vessel had four 3,017-hp tunnel bow thrusters and two 4,023-hp tunnel stern thrusters. During the ship's scheduled October/November 2015 drydock at Damen Shiprepair in Brest, France, Becker Flap Twisted Leading Edge rudders were installed to provide for better steering (increased lift) while operating at slow speeds and to increase fuel efficiency.

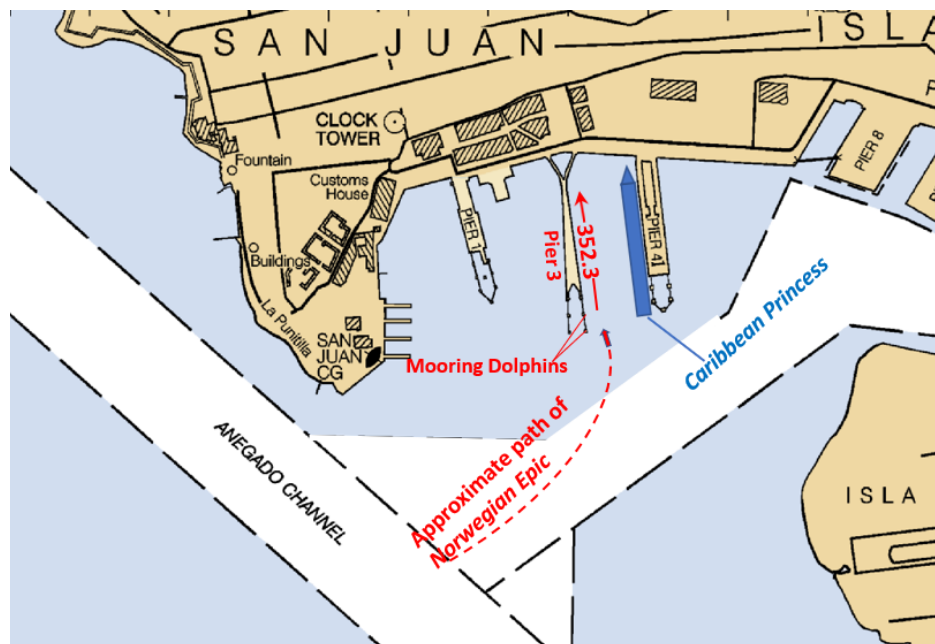
Accident Events

Two days before the accident, while en route to Tortola, British Virgin Islands, the *Norwegian Epic* suffered a failure to the electric motor driving its port propeller. The failure reduced the motor's power by half, but the vessel continued its regularly scheduled itinerary. About 1314 on February 11, the day before the accident, the electric motor to the port propeller suffered another casualty that rendered it inoperable. To prevent damage to the port shaft's turning gear, the port shaft was locked at sea, which reduced the vessel's maximum speed and the effectiveness of the port rudder. The company then directed the master to bring the ship to San Juan, a port at which it had never before called, to better assess the damage and obtain technical assistance.

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While transiting to San Juan, the *Norwegian Epic*'s master received an email from the vessel's agent detailing the cruise ship's berth on the east side of Pier 3 (Pier 3 east). Pier 3 east was approximately 1,102 feet long, had a measured bow-in dock heading of about 352.3°, and was constructed with a combination of solid pier and two mooring dolphins. The forward part of the cruise ship would be tied up to the solid pier, and the stern lines of the vessel would be tied to the mooring dolphins. The mooring dolphins were connected to the solid pier by metal walkways called "catwalks." About 571 feet to the east of Pier 3 was Pier 4 (also divided into 2 berths named east and west); the cruise ship *Caribbean Princess* was docked at Pier 4 west, leaving about 450 feet of space for the captain to maneuver the *Norwegian Epic*.

A pre-arrival docking brief included expected berthing conditions and tidal information. No current information was noted, and there was no logbook entry of when this brief was held. The master stated that the current was flooding but also told investigators he did not know the velocity or in what direction the current set for that specific pier.



Berthing area and approximate path of the *Norwegian Epic*. The *Caribbean Princess* is not to scale. (Background source: NOAA chart 25670)

On February 12 at 1640, about 5.5 miles from the entrance of San Juan harbor, the San Juan pilot boarded the *Norwegian Epic* and went to the bridge. Shortly after the pilot arrived on the bridge, a master/pilot exchange was held. According to both the master and the pilot, they discussed the maneuvering capabilities of the vessel, including the inoperability of the port shaft. A pilot card—which contained information about the vessel's principle dimensions, propulsion, thrusters, rudders, and anchors—was provided to, and signed for by, the pilot. The master told the pilot that with the port shaft locked, the maximum maneuvering speed was 12 knots. They agreed that the pilot would conn the vessel to a position near the berth, and the master would take the conn for the final berthing operation.² The master and pilot told investigators that they had never worked together before.

² The pilot said that he could not "specifically recall discussing the return of the conn to the master for the final berthing operation but (he) was fairly certain that it was discussed because that's standard for every cruise ship."

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Earlier in the day (at 1543), the National Weather Service had issued a forecast for an east wind of 15–20 knots with higher gusts. A small craft advisory was also in effect through February 13. As captured on the voyage data recorder (VDR), the pilot told the master that the current at the berth was “only one knot ebbing.” The pilot also recalled stating on numerous occasions that they needed to remain well to windward, “so much so that we should approach Pier number 4,” in order to compensate for the wind, and at 1718:01, the pilot told the master, “We should plan like we are going to where...the *Caribbean Princess* is.”

The vessel’s VDR also captured the pilot telling the master that two tugs (the *Beth McAllister* and the *Dorothy McAllister*) were ordered for docking and would be used to assist in turning and berthing the vessel, with a third tug available on standby. The pilot also stated that the usage of tugs for berthing was discussed at this time. The master stated that he had used tugs in the past and under similar wind conditions, although not with one shaft locked, and he believed the docking evolution could be safely accomplished, based on the predicted weather and the pilot’s representation that the tugs were of adequate size. Although the pilot had never docked the *Norwegian Epic* before, he had docked cruise ships of similar size and dimensions (though not with one shaft inoperable) and believed the evolution could be safely accomplished. When investigators asked the master if he felt that he and the pilot had a clear understanding on the use of the tugs and the exact approach they were going to take to Pier 3, the master replied “definitely, we discussed our approach.”

At 1650, the master/pilot exchange was completed, and the pilot took the conn, with steering and propulsion controlled from the midship bridge console. The staff captain, watch officer, lookout, and helmsman were also on the bridge to assist in the docking evolution. At 1706, the *Beth McAllister* was made fast to the starboard bow, and the *Dorothy McAllister* was made fast to the starboard quarter (the captains of both tugs told investigators that all equipment aboard their tugs was in good working order). According to the vessel’s VDR, the ship’s speed was about 5.5 knots, and the wind was out of the east about 25 knots. As the pilot guided the vessel towards the berth, he began turning to port.

At 1716:23, with the master, pilot, and staff captain positioned at the port bridge wing conning station, the master stated that he would take control. At 1716:43 the pilot was heard saying, “I just don’t wanna get too close to that corner yet” (most likely referring to Pier 3 on the port side of the vessel), and at 1716:54, the master took the conn with the ship’s heading about 054.2° and speed about 2.7 knots, and the wind out of the north-northeast about 25.1 knots.³ At this time, the *Norwegian Epic* continued its turn to the left, with its bow about 1,250 feet from the end of Pier 3 and about 1,500 feet from the *Caribbean Princess*. With all four bow thrusters and all three stern thrusters online, the master began maneuvering the *Norwegian Epic* towards Pier 3 east, using a combination of the bow thrusters, stern thrusters, rudders, and the starboard engine. The master did not always announce his actions or relay orders to anyone on the bridge. At 1717:59, the master asked the pilot, “try to stay away from this corner...yes” (again, likely referring to Pier 3 on the port side of the vessel). The pilot confirmed, “Yes, yes. Like I said, we should plan like we were going to where the *Caribbean Princess* is...” and “necessarily use the tugs of course.”

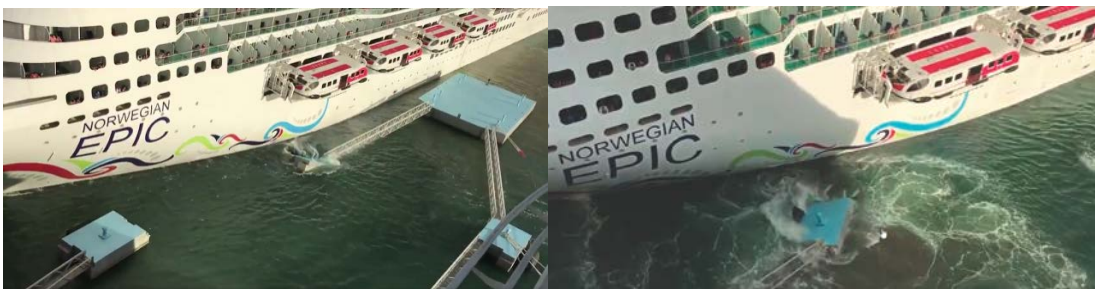
At 1718:29 the pilot told the master that he was going to start pulling on the tugs so that they would be ready to work. The pilot then told the tugs in Spanish via his handheld VHF radio, to pull

³ The wind speed was recorded by the *Norwegian Epic*’s anemometer located about 58.9 meters (193.2 feet) above the water surface. Marine local wind forecasts are for distances of 10 meters (32.8 feet) above the water.

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half astern (away from the dock) at 90°. ⁴ At 1721:09, the pilot repeated his earlier command (in Spanish) of half astern to the *Beth McAllister*, and at 1721:45, the pilot (in English) ordered the *Beth McAllister* to pull full astern. About 1722:08, the master gestured as if pushing an object towards the starboard side and said, “okay because he’s...stop the bow.” ⁵ Seven seconds later, the pilot said, “I’m going to reduce more the tug now, the forward tug,” and at 1722:18, he radioed, “*Beth* slow.” The only order relating to the tugs that was given by the master to the pilot occurred at 1723:12 when the master told the pilot “full.” The pilot then ordered the *Beth McAllister* and the *Dorothy McAllister* to pull half astern, and at 1723:18, the pilot ordered both tugs to pull full astern in order to get the *Norwegian Epic* closer to Pier 4 and farther from the corner of Pier 3. CCTV images of both tugs showed that changes in the wash from their propellers coincided with the approximate times that engine orders were given to the tugs by the pilot.

During the docking maneuver the captain operated both bow and stern thrusters both towards and away from the dock at various times and at various percentages, additionally using the vessel’s twin rudders and working starboard propeller to position the vessel alongside the dock. The ship’s rudders were at an angle of 1° or less from the time that the master took the conn up until 1723:58, when they were increased to between 35° and 42° to port. At the time of impact with the first mooring dolphin (1724:55), the rudders were at 35° to port, with the starboard engine astern at 53 rpm.



Left: Image of the *Norwegian Epic* as it struck the first mooring dolphin and catwalk, which collapsed. Right: Image of the second dolphin and catwalk as it collapsed after being struck. (Source: TweetsWithTito@dunard2)

About 1724, the master realized that the *Norwegian Epic* was going to “touch” the pier, and between 1724:00 and 1724:12, he increased bow thruster power towards the pier, and then from 1724:12 until the time of first impact at 1724:55, he went from 50% bow thruster power to port to 100% bow thruster power to starboard. After being struck, the dolphin and connecting catwalks collapsed into the harbor. A short time later, the *Epic* struck the dolphin that was closer to shore, and it also collapsed with its connecting catwalk.

The ship then continued its docking evolution without further mishap and was all fast to the pier at 1814. The strikes to the dolphins left two indentations to the hull of the ship above the waterline that were each about 6 feet 4 inches long, 20 inches high, and 4–6 inches deep. No injuries or pollution were reported, and total damages to the ship and pier structure were estimated at \$3.7 million. Drug and alcohol test results for the relevant ship crewmembers and pilot were negative.

⁴ The VDR voice recordings also captured tug boat personnel repeating, by radio, the orders given to them by the pilot.

⁵ As seen on closed circuit television (CCTV.)

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Damage to the *Norwegian Epic*'s hull.

Analysis

The National Weather Service issued a small craft advisory with wind gusts greater than 20 knots for the docking period, and the master, pilot, and tug captains all stated that wind speeds and directions at the time of docking were consistent with those predictions. Both the master and pilot stated that they felt the ship could be docked in the conditions encountered and with the tugs used. A review of US Coast Pilot passages regarding the current in San Juan Bay found that eastern trade winds generally caused a west drift to the current. The pilot was heard on the VDR recording stating that the current was “only one knot ebbing.” The resulting forces from the wind and current set the *Norwegian Epic* west towards Pier 3.

According to both the master and pilot, they discussed the docking maneuver during their initial master/pilot exchange. The pilot told the master on numerous occasions that they needed to head towards Pier 4, which was east of Pier 3. As was customary with all cruise ships in the San Juan port, the master docked the vessel, and the master and pilot stated that they would use two tugs for docking. Although the master and the pilot discussed the use of tugs, they did not discuss how the tugs would be controlled or who would control them. The master was only heard giving one verbal order regarding the tugs (just prior to the vessel's contact). According to the parametric data from the VDR, there was a point in the maneuver when both the tugboats and the thrusters were in opposition to each other's actions, demonstrating the lack of coordination between the master and the pilot, beginning with the master/pilot exchange and continuing throughout the docking evolution.

Many of the pilot's orders to the tugs and the tug captains' replies were in Spanish. The pilot should have related his commands to the captain in English. The master also used gestures instead of verbal orders. Perhaps this could have worked if the master and pilot had agreed upon this method, but this was the first time they had worked together, and they had not previously agreed to this method of communicating tug orders.

The master used the bow thrusters to push the bow toward the dock when the bow was closing on it; he did not use full bow thruster power away from the dock until about 1724:36, seconds before impact with the first dolphin. Investigators only heard one reference to distance on

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the VDR. Frequent reports of the vessel's distance from various reference points regarding clearances from both the other cruise ship and Pier 3 might have given the master a better appreciation of his vessel's close approach to the dock. This would have given the master better indication of what thrusters to use, the power at which to run them, and direction to move the ship, as well as how to use the tugs.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the contact of the cruise ship *Norwegian Epic* with San Juan Cruise Port Pier 3 was a lack of communication and coordination between the master and pilot, which resulted in a poorly executed docking maneuver.

Vessel Particulars

Vessel	<i>Norwegian Epic</i>
Owner/operator	Norwegian Cruise Line
Port of registry	Nassau, Bahamas
Flag	Bahamas
Type	Passenger
Year built	2008
Official number (US)	8001629
IMO number	9410569
Classification society	Det Norske Veritas
Construction	Steel
Length	1,080 ft (329.2 m)
Draft	29.6 ft (9.02 m)
Beam/width	133.3 ft (40.64 m)
Tonnage	155,873 GT ITC
Engine power; manufacturer	Three 15,288 hp (11.4 MW) MaK VM12 43C and three 20,384 hp (15.2 MW) MaK VM 16 43C diesel engines powering electrical generators.
Propulsion	Twin shaft with fixed-pitch propellers, each driven by a 32,184 hp (24 MW) electric motor.
Persons on board	6,023

NTSB investigators worked closely with our counterparts from Coast Guard San Juan, Puerto Rico, throughout this investigation.

For more details about this accident, visit www.nts.gov and search for NTSB accident ID DCA19FM016.

Issued: January 29, 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).
