



National Transportation Safety Board

Washington, D.C. 20594

Marine Accident Brief

Accident No.: DCA-05-MM-018

Vessel: Bahamas-flag passenger vessel *Norwegian Dawn*, IMO No. 9195169, 965 feet long, 105 feet wide, 92,250 gross tons, draft 27 feet, built in 2002

Accident Type: Heavy-weather damage

Location: Atlantic Ocean, 120 miles east of Charleston, South Carolina (latitude 32°28.6' N, longitude 76°57.0' W)

Date: April 16, 2005

Time: 0615 eastern daylight time

Owner: Norwegian Cruise Line, Miami, Florida

Property Damage: \$750,000

Injuries: Passengers 4 (required medical attention)

Complement: Crew 1,159
Passengers 2,590

Incident

On April 16, 2005, the Bahamas-registered passenger vessel *Norwegian Dawn* suffered heavy-weather damage while returning to New York on the last leg of a regularly scheduled roundtrip cruise between New York and Miami, Florida, with stops in Port Canaveral, Florida, and the Bahamas (figure 1). The ship, operated by Norwegian Cruise Line of Miami, offers a variety of entertainment for passengers, including an onboard casino. Passengers, primarily U.S. citizens, embark on the trips in New York.

The *Norwegian Dawn* began the voyage in New York on Sunday, April 10, 2005. Before departure, the port call in Nassau, Bahamas, was canceled for business reasons. The vessel docked in Miami on Thursday, April 14. At 0056¹ on Friday, April 15, the vessel departed Miami on the return trip to New York. The voyage plan estimated the total trip distance as 1,020 miles. The maximum service speed of the ship is 25 knots.² The vessel was expected to arrive at the New York pilot station at 0016 on Sunday, April 17.

¹ Times are eastern daylight time, based on a 24-hour clock.

² Norwegian Cruise Line website <<http://www.ncl.com/fleet/03/deckplans.htm>>.



Figure 1. The *Norwegian Dawn* encountered heavy weather off the coast of South Carolina, in the area shown by an **X**, during its return trip from Miami to New York.

Weather. The crew received weather forecasts from the National Weather Service that predicted storm and gale conditions for the vessel's intended path from Miami to New York, with wind speeds from the north at up to 40 knots and waves between 14 and 28 feet high. Higher waves were predicted along the main axis of the Gulf Stream. On the afternoon of April 15, the *Norwegian Dawn*'s master moved the ship's route farther offshore to avoid the predicted weather conditions. According to the vessel's chief engineer and the hotel director, the master notified the crew and passengers at 1000 on April 15 that rough weather was forecast. Deck log entries indicate that such notification was given throughout the day.

The *United States Coast Pilot* describes the seasonal weather for the coasts of South Carolina, Georgia, and Florida as follows:³

The occasional winter storm results in strong winds and rough seas from October through April. Waves of 8 feet (2.4 m) or more are reported about 20 to 30 percent of the time in deep water, but gales occur less than 1 percent of the time. However, winds of 40 to 50 knots have been recorded in all of these months.

At 1400 on April 15, the *Norwegian Dawn* was averaging 20.6 knots over the ground on a northeasterly course. The ship slowed its speed over the next 6 hours, and a log entry noted that the ship's course was changing due to heavy weather. At 1700, in preparation for the predicted conditions, the crew completed the heavy-weather checklist, which included closing outside areas on decks 7 and 8. The crew reported that the ship slowed and headed into the wind and seas to reduce rolling.

At 2000 on April 15, the watch officer noted winds from the north-northwest. The ship's navigation data show that the vessel's speed over the ground was 15.7 knots. According to the chief engineer and the engine log, the ship's propulsion tripped briefly around 2015 when the propellers on the propulsion drives came out of the water as the ship pitched.⁴ The master told the Safety Board that he believed some damage to the stern navigation light platform, aft radar, and forward crew hot tubs occurred around this time. According to log entries, at 2040 the master made another announcement over the public address system to update passengers on the weather and give safety precautions, in accordance with normal procedures for such conditions.

Throughout the evening and early morning hours of April 15 and 16, the weather conditions deteriorated, causing the master to operate the vessel at reduced speed and use manual steering instead of the autopilot. According to the ship's radar log, the master contacted the U.S. Coast Guard at Portsmouth, Virginia, three times to report the weather conditions and the vessel's status. The casino closed at 0200 on April 16 because of the rough weather.

Damage. At 0610 on April 16, the ship was making 7 knots over the ground. The wind and sea conditions had eased slightly, according to ship's officers and log entries. However, the watch officer on the bridge observed the vessel pitching and saw the bow start to plow into the seas. The master, who had been on the bridge throughout the night, told investigators that he felt the ship pitch three times in succession. The watch officer stated that all the waves were very large, and that all were roughly the same height. On the third wave, he said, the ship's bow took heavy green seas, which at 0615 cascaded directly over the bow and struck the forward part of the vessel's superstructure.

³ National Oceanic and Atmospheric Administration, National Ocean Service, *United States Coast Pilot*, vol. 4 (Atlantic Coast: Cape Henry, Virginia, to Key West, Florida), 2004, p. 369.

⁴ The *Norwegian Dawn* is propelled by electric motors. To prevent overspeed damage, the motors will stop, or "trip," if their speed exceeds a certain number of revolutions per minute (rpms). When a propeller comes out of the water, it allows the motor to run without resistance and thus exceed its rpm limits.

The seas damaged one cabin on deck 9 and one cabin above it on deck 10 (figure 2). The cabins face forward and have balconies overlooking the bow area. The balconies have a teak rail supported by welded aluminum vertical supports mounted on top of a low steel bulwark. The aluminum rail supports failed, and the teak handrails shattered the fixed stateroom windows. The broken glass blocked the drains on the weather side of the windows so the water could not escape. Seawater was then trapped between the steel bulwark and the aft interior cabin bulkheads. At least 1 foot of seawater entered the cabins and traveled under the cabin doors into the corridors. Both cabins sustained severe water damage to the windows, bulkheads, fixtures, and carpeting.

Injuries. A crewmember saw an injured passenger in the passageway outside a damaged cabin and went to inform the watch officers on the bridge. Two passengers in the damaged cabin on deck 9 received lacerations and two passengers in the damaged cabin on deck 10 received bruises. The watch officer informed the crew of the medical situation, and the ship's doctors and nurses took the injured passengers to the medical facilities for treatment. The crew responded to the passenger injuries in a timely and appropriate manner.

Course Diversion. After receiving word of passenger injuries and damage, the master turned the ship to the southwest and put the seas and swells aft and to the right side, or "starboard quarter," to ease the pitching, which the vessel's stabilizers⁵ could not compensate for. This maneuver required putting the weather on the vessel's right side, or "starboard beam." The master stated that turning to a different heading was necessary to improve the ship's pitch and roll.

According to the ship's log, the master called the Coast Guard at 0815 and reported the incident. The master then contacted Norwegian Cruise Line to arrange for a suitable diversion port to make repairs, because many cabins were uninhabitable. At noon, the company arranged clearance for the ship to enter the Port of Charleston, South Carolina.

Damage Survey. The *Norwegian Dawn* arrived in Charleston at 1608 on April 16. The Coast Guard and Det Norske Veritas, the ship's classification society, boarded and inspected the vessel. In addition to the damage to the two cabins, the Det Norske Veritas survey showed damage to the deck supports under the spare anchor, on the starboard side of the bow.⁶ An outside firehose station on the forward superstructure was destroyed. One forward-facing window frame in the pilothouse was knocked out of alignment. The watertight door to the open bow area on the foredeck was also damaged. Sixty-three cabins on the forward parts of decks 9 and 10 were flooded with an inch of seawater that had spread from the two cabins with broken windows, requiring the carpets and associated fixtures to be replaced. Temporary repairs were made by welding steel plates over the damaged windows.

⁵ Stabilizers reduce rolling, the most common cause of passenger discomfort, but they have virtually no effect on a ship's pitching motion.

⁶ "Temporary Repairs After Heavy Weather Damage," Survey Report (preliminary) by Det Norske Veritas at Charleston, South Carolina, April 16, 2005.

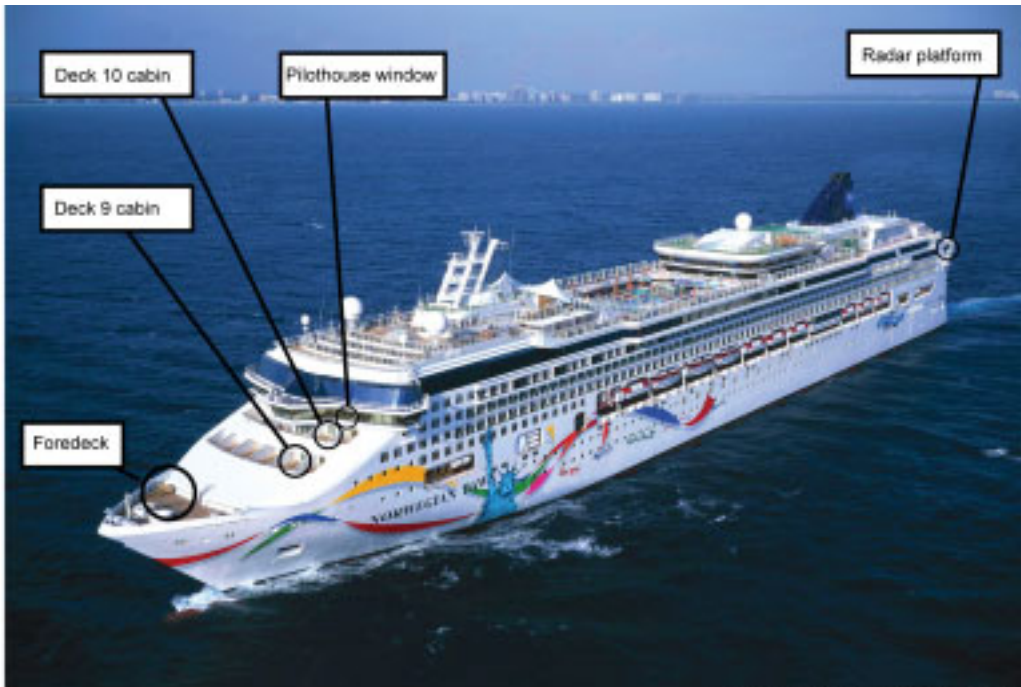


Photo courtesy Norwegian Cruise Line

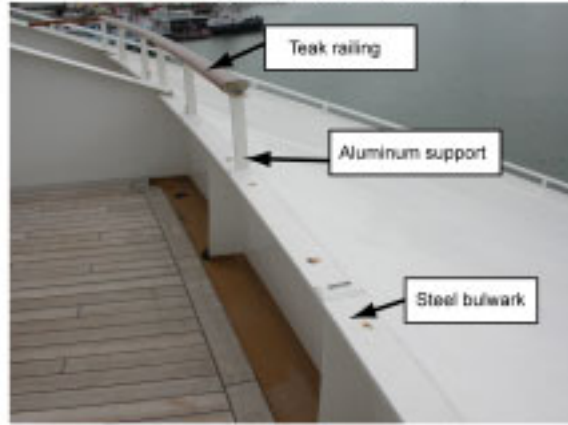


Figure 2. Circles in upper photo indicate damaged areas on *Norwegian Dawn*—from left to right, foredeck (crew hot tubs, deck supports under anchor, firehose support, watertight door), two cabins overlooking bow, pilothouse window frame, and stern navigation light platform. Lower left photo shows outside of damaged cabin before its window was broken by waves during heavy seas. Lower right photo shows missing rail supports on balcony of damaged cabin.

Return to New York. About 500 passengers disembarked in Charleston, and the *Norwegian Dawn* resumed the trip to New York at 0300 on April 17. The four injured passengers chose to remain on board. The ship arrived in New York at 1000 on April 18.

Investigation

After examining the *Norwegian Dawn* in Charleston and monitoring the temporary repairs, Coast Guard investigators reboarded the vessel when it landed in New York on April 18 to continue their inquiry. The *Norwegian Dawn* then embarked on another cruise. When the vessel reached its first scheduled stop in Port Canaveral, Florida, the investigation resumed, with the Bahamian Maritime Authority as the lead investigative agency. One investigator from National Transportation Safety Board headquarters in Washington, D.C., traveled to Port Canaveral to join the investigation, along with two investigators from the Coast Guard marine safety office in Jacksonville, Florida, who conducted an informal investigation. The investigators completed their work on April 20.

Discussion

The *Norwegian Dawn* was on a scheduled run from Florida to New York in April. The weather forecast for the mid-Atlantic coast was within seasonal expectations. A brief encounter with gale-force winds or sea conditions aboard a 965-foot passenger ship, while uncomfortable for the passengers, is not unexpected while transiting seas off the southeast coast of the United States at that time of year.

Although the forecast weather conditions did not appear to pose a safety hazard for the ship, the master made a course adjustment to avoid the main axis of the Gulf Stream for a more comfortable ride. When the vessel encountered heavier-than-expected wind and seas, the ship's officers maintained its heading into the wind and seas to minimize rolling, and also reduced the vessel's speed.

After attempting to minimize the ship's exposure to the forecast conditions, the master changed his itinerary and slowed the vessel. Rather than attempting to maintain the scheduled arrival time in New York, the master decided to lower the ship's speed and change its heading for the passengers' comfort.

According to statements of the chief engineer and the hotel director, the crew secured gear, closed off outer decks, and properly prepared the vessel for heavy weather, while making advisory announcements to the passengers. The hotel staff tried to accommodate the passengers' needs and make them comfortable. To see water flowing on the upper decks naturally caused concern among the passengers, but at no time did the damage pose a serious safety hazard to the ship.

The prevailing wind and sea conditions caused the vessel to pitch and seas to break over the bow. The localized area of damage on the *Norwegian Dawn* was consistent with waves striking the ship's superstructure. The water exerted enough force to shear off the welds for the aluminum rail supports on the balconies of two cabins, allowing the teak balcony rails to break loose and crash into the cabin windows. The broken glass filling the drains compounded the water damage by allowing a large amount of water to enter

the two cabins and damage the carpets in 61 other cabins. The ship's operating at reduced speed when the waves hit probably limited the damage.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the damage to the *Norwegian Dawn* and of the injuries suffered by its passengers was waves breaking over the bow during the ship's unavoidable encounter with severe weather and heavy seas.

Adopted: November 30, 2005