

November 7, 2024

MIR-24-35

Contact of Cruise Ship *Ruby Princess* with Port of San Francisco Pier 27

On July 6, 2023, about 0606 local time, the cruise ship *Ruby Princess* was attempting to moor at Port of San Francisco Pier 27 in San Francisco, California, when the vessel's port quarter contacted the pier (see figure 1 and figure 2).¹ There were no injuries, and no pollution was reported. Damage to the vessel and pier was estimated at \$1.2 million.



Figure 1. *Ruby Princess* underway in San Francisco Bay on September 4, 2023, after the contact. (Source: Robert Whitaker)

¹ (a) In this report, all times are Pacific daylight time, and all miles are nautical miles (1.15 statute miles). (b) Visit [ntsb.gov](https://www.ntsb.gov) to find additional information in the [public docket](#) for this NTSB investigation (case no. DCA23FM040). Use the [CAROL Query](#) to search investigations.

Casualty Summary

Casualty type	Contact
Location	Pier 27, San Francisco Bay, San Francisco, California 37°48.23' N, 122°24.02' W
Date	July 6, 2023
Time	0606 Pacific daylight time (coordinated universal time -7 hrs)
Persons on board	3,998 (2,885 passengers, 1,112 crew, 1 pilot)
Injuries	None
Property damage	\$1.2 million est.
Environmental damage	None
Weather	Visibility 10 nm, overcast, winds west 6 kts, air temperature 57°F, water temperature 60°F, sunrise 0554
Waterway information	Bay, depth 37 ft near Pier 27, ebb current 2.8 kts at Pier 23, current direction 333°

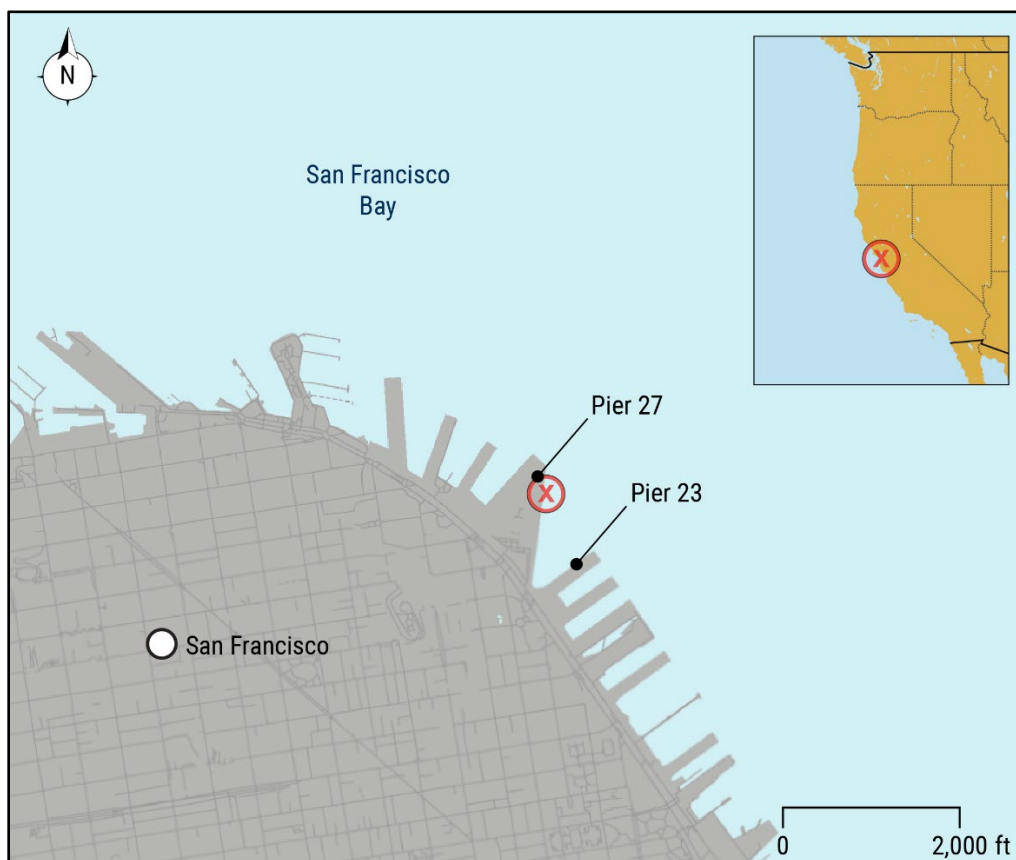


Figure 2. Area where the *Ruby Princess* contact occurred, as indicated by a circled X. (Background source: Google Maps)

1 Factual Information

On July 6, 2023, the 947-foot-long cruise ship *Ruby Princess* was inbound to San Francisco, California. At 0443, when the *Ruby Princess* was about 11 miles west of the Golden Gate Bridge, a San Francisco Bay pilot boarded the vessel. He and the master held a master/pilot exchange and discussed the planned docking maneuver for their anticipated berth at Pier 27.² During the exchange, neither the master nor the pilot expressed concerns about the vessel; they discussed the strong ebb current—calculated to be 2.8 knots—along the waterfront.

The ship had two 28,150-hp (21,000-kW) electric motor-driven main propulsion shafts with fixed-pitch propellers and three bow and three stern thrusters, with all six thrusters online and operating for the docking. Electrical power was provided by a combination of the vessel's six diesel-electric generators (three of its four larger generators and one of its two smaller generators).

The pilot assumed the conn at 0452, when the vessel was west of the Golden Gate Bridge. At 0559, when the ship was southeast of Pier 27 and abeam of (perpendicular to) Pier 23 (the adjacent pier), control of the main propulsion and thrusters was transferred from the center console of the bridge to the port bridge wing. A minute later, at 0600, the master—who had docked at Pier 27 previously—assumed the conn for the final approach to Pier 27.³ As was required for docking when the ebb current is more than 1.5 knots, two tugs, the *Delta Linda* and *Valor*, were assigned to assist in docking the *Ruby Princess*. The *Delta Linda* had a line attached to its starboard bow, and the *Valor* was standing by off its port quarter (without a line attached).

With Pier 27 about 450 yards from the vessel's starboard quarter and the vessel heading of 139°, the master began the approach to Pier 27 (which was at a heading of 7°) in the ebb current, while the pilot managed the tugs. The master swung the bow to port using the vessel's main propulsion, rudders, three bow thrusters, and three stern thrusters. The master and pilot intended to maneuver the vessel slowly to the dock while turning 132° in the space between Piers 23 and 27. They intended to back enough of the ship into this area so that the "shadow" of

² A master/pilot exchange is required at the start of pilot transits and typically includes discussion of the vessel's navigational equipment, any limitations of maneuverability, available engine speeds, berthing maneuvers, intended course and speed through the waterway, anticipated hazards along the route, weather conditions, tides and/or currents that could affect the route, composition of the bridge team and deck crew both forward and aft including bow lookout, and so on.

³ According to the Board of Pilot Commissioners for the Bays of San Francisco, San Pablo, and Suisun, it was not unusual for Princess Cruises' masters to take the conn for docking.

Pier 23 would mitigate the effect of the 2.8-knot ebb current on the vessel's hull. Once the vessel was turned around and parallel to Pier 27, with Pier 27 on the ship's port side, the master and pilot would maneuver the vessel into its berth.

Contrary to the master and pilot's intentions, at 0604:28, the *Ruby Princess* was broadside to the ebb current, and, according to the master, outside of the shadow of Pier 23. At 0604:42, according to voyage data recorder (VDR) data, the vessel's heading was 047°, its port quarter was 165 yards from Pier 27, and its lateral movement toward the pier was 2.7 knots. The master attempted to use the main propulsion and stern thrusters to slow the vessel, and the vessel's lateral movement toward the pier slowed to 1.7 knots during the next 78 seconds. However, the vessel's lateral movement from the current could not be overcome, and the *Valor*, which had been positioned off the *Ruby Princess*'s port quarter, moved away from the vessel to avoid being caught between the vessel and dock. At 0606, the *Ruby Princess*'s port quarter contacted Pier 27 about 60 yards down from the head of the pier on its southeast side (see figure 3 and figure 4).

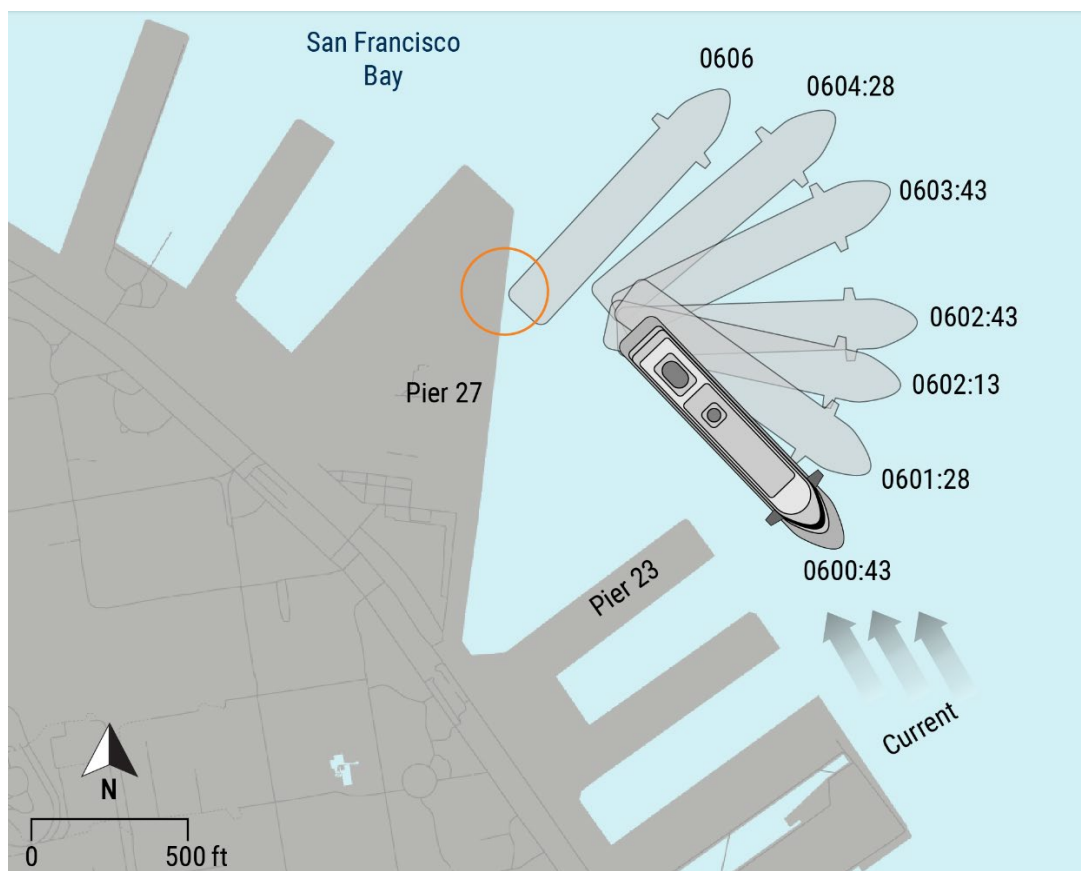


Figure 3. *Ruby Princess* positions as the master attempted to rotate the vessel counterclockwise to dock at Pier 27. Scale approximate; two assist tugs not shown. (Background source: Google Maps; vessel position source: *Ruby Princess* voyage data recorder)

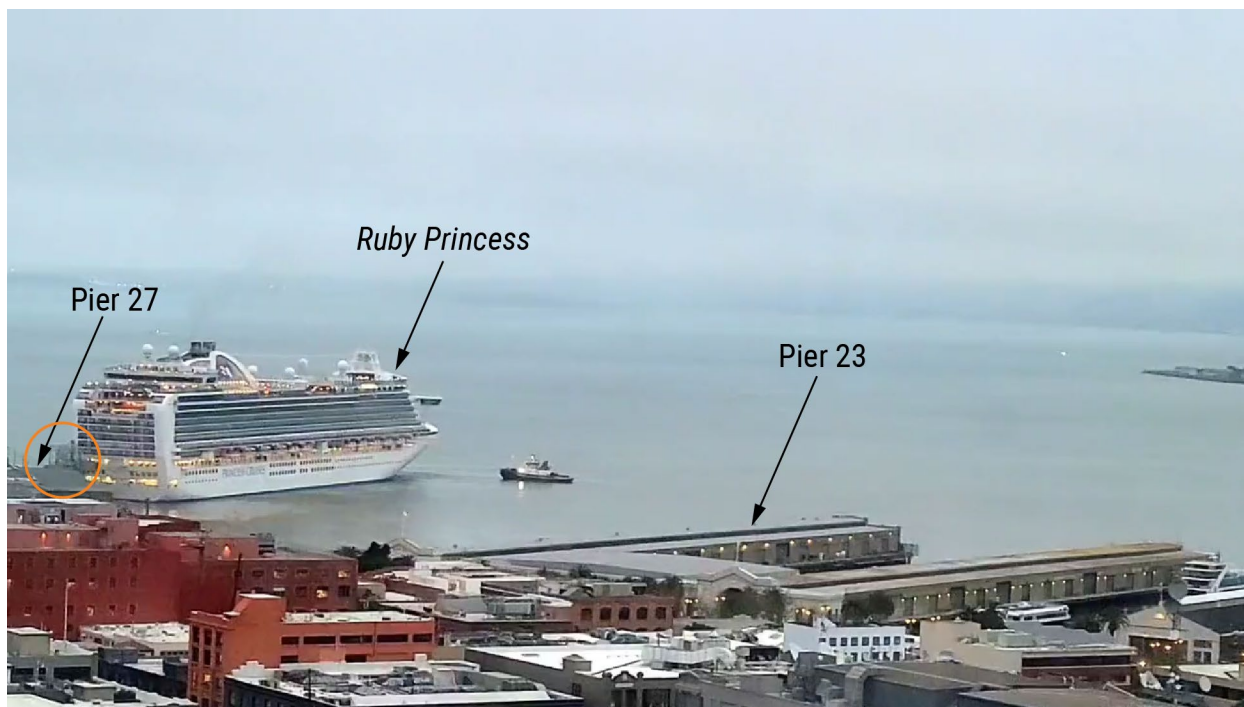


Figure 4. *Ruby Princess* at time of contact (circled) with Pier 27. (Background source: CMPTL Family on X)

The master moved the *Ruby Princess* off the pier and into San Francisco Bay, then reapproached Pier 27. This time, the *Valor* had a line attached to the stern centerline chock and was positioned off the starboard quarter. (The VDR propeller shaft data [rpm] showed similar rates of change during each of the two approaches.) The master turned the vessel around and backed toward Pier 27 while the *Valor* and *Delta Linda* pulled the vessel's starboard quarter and bow away from the dock. The *Ruby Princess* was successfully docked, port side to the pier, at 0705.

The contact resulted in the penetration of the *Ruby Princess*'s hull, and the vessel sustained internal structural damage in a heeling tank about 33 feet above the waterline. On Pier 27, a metal fender and the face of the pier in the immediate area of the fender were damaged (see figure 5). Repairs to the ship were estimated to cost \$200,000, and repairs to the pier were estimated to cost up to \$1 million.

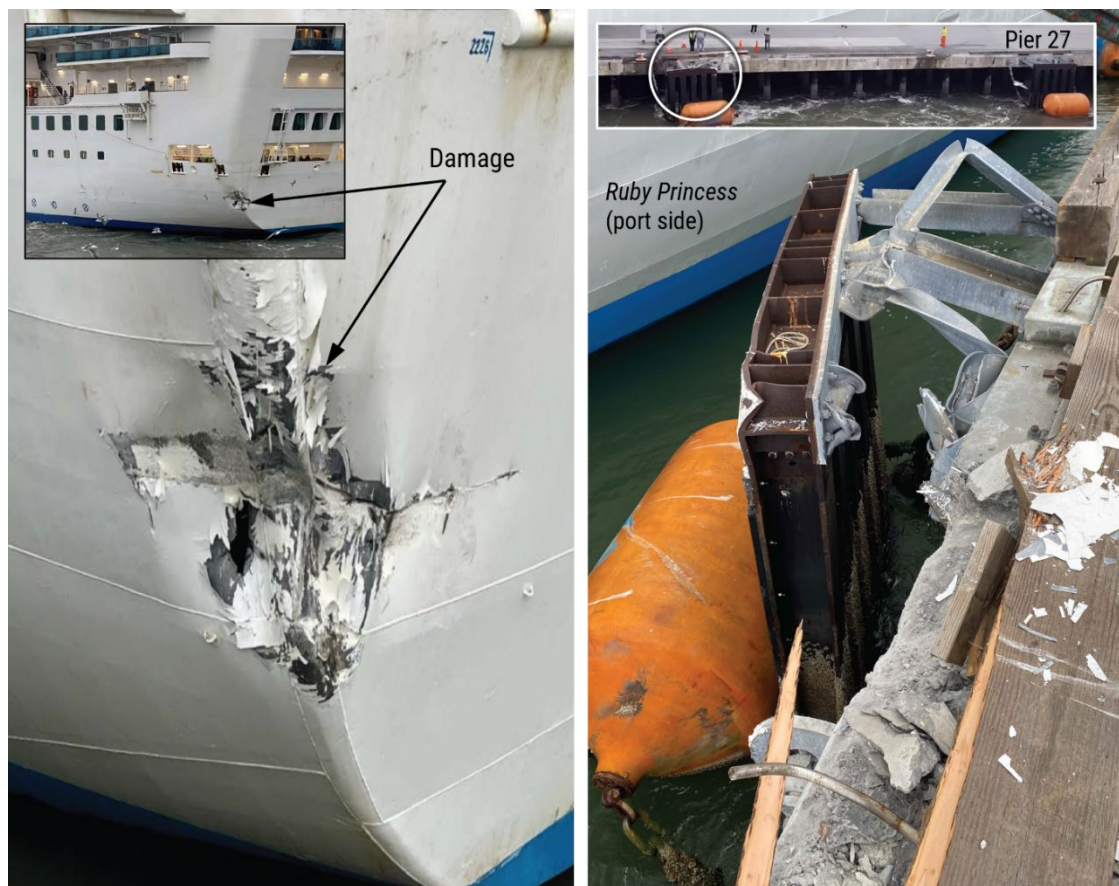


Figure 5. Left to right: *Ruby Princess* damage and Pier 27 damage (circled in inset) on July 6, 2023. (Source: US Coast Guard (left); Coast Guard and KRON4 (inset) (right))

2 Analysis

As the *Ruby Princess* approached Pier 27, the master assumed the conn from the pilot. Anticipating that the strong ebb current near Pier 27 would affect docking, the master and pilot planned an approach that involved rotating the vessel into a position where Pier 23 would block the current. However, when the master began to rotate the vessel, it wasn't positioned far enough down from the head of Pier 23, leaving the vessel's starboard side exposed to the strong current. The 2.8-knot current accelerated the vessel's lateral movement northward (to port) toward Pier 27, overwhelming the master's ability to maintain control of the vessel's approach to the dock and forcing the *Valor*, which had been positioned off the *Ruby Princess*'s port quarter, to move away from the vessel and dock to avoid contacting the pier. Because the master did not carry out the *Ruby Princess*'s approach as planned (not backed far enough in to be protected from the current by Pier 23), the vessel's stern approached the pier too quickly as the master rotated the vessel. The master attempted to use the vessel's propulsion and stern thrusters to avoid striking the pier; however, the vessel's

lateral movement from the current could not be overcome, and the *Ruby Princess* struck Pier 27.

After the contact, the master and pilot took additional measures (reconfigured an assist tug's positions) before again attempting to dock. With these measures in place, they successfully docked the vessel.

3 Conclusions

3.1 Probable Cause

The National Transportation Safety Board determines that the probable cause of the contact of the cruise ship *Ruby Princess* with Port of San Francisco Pier 27 was the master not carrying out the approach to the dock as planned to account for the anticipated current.

Vessel Particulars

Vessel	<i>Ruby Princess</i>
Type	Passenger (Cruise Ship)
Owner/Operator	Princess Cruise Lines Ltd (Commercial)
Flag	Bermuda
Port of registry	Hamilton, Bermuda
Year built	2008
Official number (US)	N/A
IMO number	9378462
Classification society	Lloyd's Register
Length (overall)	946.8 ft (288.6 m)
Breadth (max.)	118.3 ft (36.0 m)
Draft (casualty)	27.4 ft (8.4 m)
Tonnage	113,561 GT ITC
Engine power; manufacturer	4 x 12,600 kW (16,890 hp); Wartsila 12V46CR generators 2 x 8,400 kW (11,260 hp); Wartsila 8L46C generators

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

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For more detailed background information on this report, visit the [NTSB Case Analysis and Reporting Online \(CAROL\) website](#) and search for NTSB accident ID DCA23FM040. Recent publications are available in their entirety on the [NTSB website](#). Other information about available publications also may be obtained from the website or by contacting—

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