



National Transportation Safety Board

Marine Accident Brief

Breakaway of Containership *Helsinki Bridge* and Subsequent Allision with Black Falcon Cruise Terminal

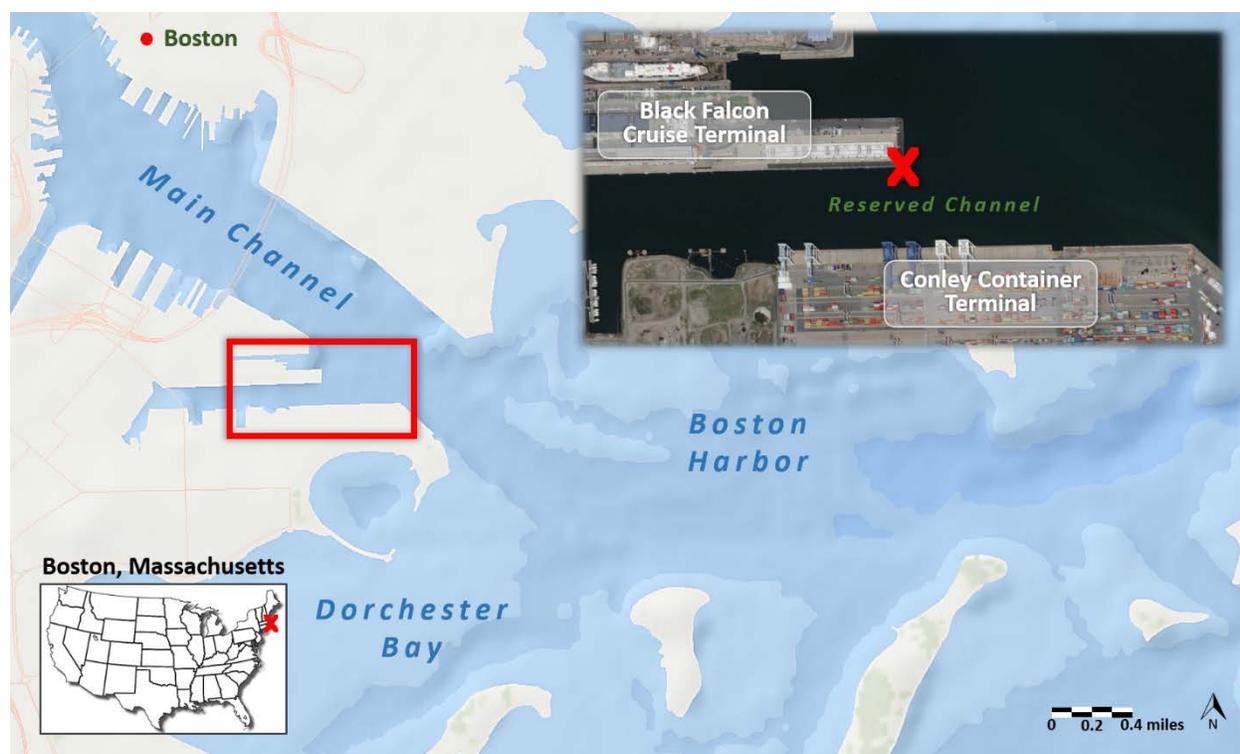
Accident type	Allision	No. DCA18FM006
Vessel name	<i>Helsinki Bridge</i>	
Location	Conley Container Terminal, Reserved Channel, Boston, Massachusetts 42°20.61' N, 71°01.32' W	
Date	December 6, 2017	
Time	0003 eastern standard time (coordinated universal time – 5 hours)	
Injuries	None	
Damages	\$610,500 est.	
Environmental damage	None	
Weather	Visibility 3 miles (less in rain showers), winds south at 24 knots with gusts up to 37 knots, air temperature 55°F, water temperature 49°F	
Waterway characteristics	The Reserved Channel in the Seaport District of South Boston connects with Boston Harbor. The width of the channel was approximately 600 feet, and the tidal range was 9.49 feet. High tide was at 0040.	

On December 6, 2017, at 0003 local time, the Panama-flagged containership *Helsinki Bridge* was moored in the Reserved Channel port side to the Paul W. Conley Container Terminal in Boston, Massachusetts. While the vessel was engaged in cargo operations at night during a period of moderate-to-high winds, a mooring bollard to which five of the vessel's head lines were secured failed. As a result of the bollard failure, the wind caused the vessel to drift away from the terminal and the remaining nine mooring lines to part. The vessel's bow then swung across the channel and struck the Raymond L. Flynn Black Falcon Cruise Terminal pier. There were no reports of pollution and no injuries among the 24 crewmembers and 10 longshoremen on board. The damage was estimated at \$570,000 for the vessel and \$40,500 for both terminals.



Preaccident photo of *Helsinki Bridge* under way.
(Photo by Matthias Boerschke at www.vesseltracker.com)

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Location of accident site where *Helsinki Bridge* broke away from its moorings at Conley Container Terminal in Boston, Massachusetts, and subsequently allided with Black Falcon Cruise Terminal pier. (Background and satellite image from NOAA ENC® Viewer)

Background Information

Construction of the Paul W. Conley Container Terminal, formerly known as the Castle Island Terminal, began in late 1979 and was completed in the fall of 1981. The terminal, owned and operated by the Massachusetts Port Authority (Massport), covered approximately 110 acres, with 1,950 linear feet of mooring availability at the waterside. At the time of the accident, the terminal was undergoing various maintenance and repair projects, including fender replacement.

The Conley Terminal was outfitted with six container cranes and moved 1.5 million tons of cargo each year. The terminal was located on the Reserved Channel in South Boston, approximately 10 nautical miles from the Broad Sound sea buoy in Boston Harbor. Directly across the channel from the container terminal to the north was the Raymond L. Flynn Black Falcon Cruise Terminal.

Accident Events

At 0931 on December 4, 2017, the *Helsinki Bridge*—a 1,097-foot-long containership flagged in Panama—departed the Global Container Terminal in Bayonne, New Jersey, for the voyage to the Port of Boston, Massachusetts. The following morning the vessel arrived outside Boston Harbor, where the harbor pilot boarded at 1000 to begin the inbound transit to the berth.

The docking pilot boarded the vessel at 1055, proceeded to the bridge, and shortly thereafter, near Castle Island, assumed the conn (control) of the *Helsinki Bridge* from the harbor

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pilot.¹ With the assistance of the tugboats *Freedom* and *Justice* positioned fore and aft, respectively, the docking pilot maneuvered the *Helsinki Bridge* into the Reserved Channel and docked the vessel port side to berths 11 and 12 at the Conley Terminal, based on the terminal's instructions provided to the pilot and vessel's agent. The vessel had called at the facility multiple times in the past.

The two berths used by the *Helsinki Bridge*, each 1,000 feet in length, had bollards spaced every 50 feet. The bollards were load-rated at berth 11 for a mix of 40 to 125 tons and at berth 12 for 80 tons.²

The mooring lines used on the *Helsinki Bridge* were placed into service in early 2012. The lines were double-braided, with the core composed of nylon fiber and the outer fibers composed of polyester. Each line was 70 millimeter in diameter and had a specified breaking strength of 941 kilonewtons (kN), approximately 106 tons-force (tnf).

According to the docking pilot's statement to investigators, he and the master discussed that winds in the area were expected to exceed gusts of 40 knots and agreed that, given the forecast, a total of 14 mooring lines were needed. The lines would be arranged as follows: five head (bow) lines, two spring lines from the bow, two spring lines from the stern, and five stern lines. This mooring arrangement exceeded the docking pilot's usual recommendation of 12 mooring lines, which would have been similar but with one less head line and one less stern line.

Once the vessel was in position, the crew began passing lines to the shoreside line handlers, fore and aft. The chief mate, who was on the bow, instructed the line handlers to place the first two head lines on a bollard just forward of the bow, which investigators found to be a 40-ton bollard (one of the lower-rated strength bollards) at berth 11.

The chief mate then directed the line handlers to place the next two head lines on the next bollard forward of the bow—west of the 40-ton bollard—beyond where construction crews had placed a temporary fence. However, the line handlers were informed by representatives from both the construction crew and Massport personnel, who were on site, that they were not allowed to use any bollards west of the temporary fence. Once the chief mate was informed of this restriction, the next two head lines were placed on the same bollard as the first two. A fifth head line was added to the same bollard, as a precaution for the high-wind forecast. The remaining spring and stern lines were placed on bollards in accordance with a more typical spacing arrangement, the five stern lines being separated among three dockside bollards.

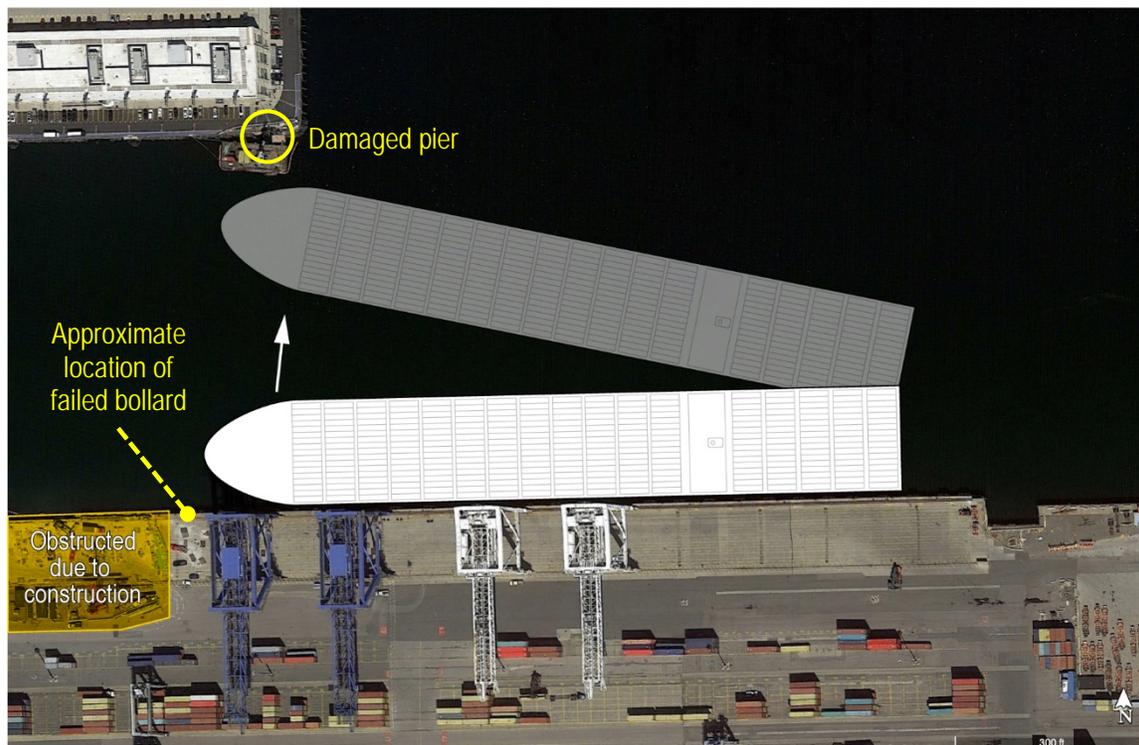
The three shoreside line handlers interviewed by investigators all stated that never before had they placed five lines on just one bollard, but they had no other option this time, since they were told not to use the bollards on the other side of the temporary fence. The chief mate also stated to investigators that typically they would not place more than three mooring lines on a single

¹ Vessels in foreign trade arriving at the Port of Boston in Massachusetts are required to have a state-licensed pilot on board to assist the crew with navigation. While state pilots can bring a vessel into port, a docking pilot is employed when the vessel requires the use of assist tugs during maneuvering and berthing or unberthing.

² Bollard and line strengths are provided in short tons (2,000 pounds).

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bollard but had to do so because of the ongoing construction at the terminal. He said that he had informed the master of the situation.



Approximate location and scale view of *Helsinki Bridge* alongside Conley Terminal and vessel's drift after breakaway. Also shown are area of terminal under construction and damaged pier at Black Falcon Terminal. Satellite image shows a work barge engaged in repair of pier. (Background from Google Earth)

The master stated that he did not consider shifting the vessel aft at the terminal to adjust the mooring arrangement because the mooring location was decided by the port authority. According to Massport's deputy port director of operations, the port authority only informs the vessel's master where to berth, not how to secure the vessel to the berth.

The safety management system for the vessel company specifically addressed the deployment and monitoring of mooring lines. The policy placed the responsibility on the master to have "familiarity with any specific shore requirements relating to shore mooring, passing traffic and tidal/weather conditions" and required him to identify any "unsafe conditions" and take "corrective actions" if possible.

At 1200, when the mooring operation was completed, the docking pilot and the harbor pilot both departed the *Helsinki Bridge*. The docking pilot told investigators that he was not aware that the shoreside line handlers had put all five head lines to a single mooring bollard. At the time, the containership's true heading alongside the facility was 269 degrees.³

³ Navigational information is based upon electronic data from the *Helsinki Bridge*'s automatic identification system (AIS).

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At 1300, cargo operations began with three of the terminal's cranes. Massport personnel told investigators that they boarded the vessel several times during the operations to alert the crew of the need to tighten the lines, because there was a gap between the vessel and the pier.

Later that night, the forecasted high winds arrived. At 0003, the wind acting upon the vessel caused the bollard to which the five head lines were secured to be torn off its base.⁴ The *Helsinki Bridge* began to drift away from the container terminal in a northerly direction. The ordinary seaman on watch at the gangway noticed that the bow was drifting away and that the five head lines were in the water. He then observed the two forward spring lines part. The ordinary seaman alerted the mate on watch along with the rest of the crew.

In just a few minutes, the remaining seven lines also parted, in succession from forward to aft, as the *Helsinki Bridge* continued to be blown out into the channel to almost a 45-degree angle from its berth.



Remaining base of bollard that failed at Conley Terminal. (Photo courtesy of US Coast Guard)

In addition to the vessel's crew, 10 longshoremen were aboard the vessel. After learning of the breakaway, the master ordered all deckhands to their respective mooring stations. He also ordered the crew to "walk out" the starboard anchor to "one shackle above the water."⁵

By 0006, the *Helsinki Bridge*'s heading had swung from 269 to 296 degrees. At that time, the starboard portion of the bulbous bow of the *Helsinki Bridge* struck the eastern end of the Black

⁴ At 0011, the closest official reporting station for the National Weather Service (Logan International Airport) recorded winds from 190 degrees, with a peak wind gust of 40 knots. There was also a potential for the current to act upon the vessel at that location with the incoming tide.

⁵ The term *walk out* describes an anchor deployment in which the anchor is lowered to the seafloor under control of the anchor windless. *One shackle* (or shot) equals 90 feet of anchor chain.

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Falcon pier. The contact stopped the swing of the bow, but the vessel's drift to the east continued until the bow cleared the pier.

Once the bow of the *Helsinki Bridge* cleared the east end of the Black Falcon pier, the vessel continued drifting due to the effects of the wind and tide. Between 0012 and 0028, the vessel's true heading swung from 312 to 352 degrees, as the *Helsinki Bridge* moved northeast at approximately 0.4 knots. The master then called for the main diesel engine and both bow thrusters to be brought online. At 0029, his use of the main propulsion and bow thrusters, along with deployment of the starboard anchor, stopped the vessel's uncontrolled drift in the harbor.

The tugboat *Justice* arrived on scene at 0032 to assist the *Helsinki Bridge*, followed by the Massport fire rescue vessel *American United*, which arrived about 10 minutes later. The two vessels remained with the *Helsinki Bridge* until another docking pilot arrived on board at 0140. The docking pilot then maneuvered the vessel to anchorage to await US Coast Guard investigators and response personnel. The longshoremen on board were shuttled back to the Conley Terminal by pilot boat.



Damage to Black Falcon pier. (Photo courtesy of Coast Guard)

The allision resulted in damage to the Black Falcon pier's support pilings and concrete surface. The bulbous bow of the *Helsinki Bridge* and the starboard hull sustained minor damage, which was limited to paint scraping and some slight indentation of the steel plate. There were no punctures of the hull or distortion of the internal structural framing. During an examination of the vessel's propeller and rudder, one of the six adjustable blades was found to have a slight deformation on its tip, but that damage was determined to have been pre-existing.

Other Information

Investigators could not determine the manufacturer of the bollard that failed at berth 11, and there was no metallurgical test performed to determine whether the material used was steel or ductile iron, which have different compressive strength-yield properties. However, construction

drawings from late 1979 indicated that this bollard type had an estimated 40-ton horizontal pull strength.

Massport did not have records indicating that the bollards at the Conley Terminal had been subjected to load testing to determine their integrity and continued suitability for intended service. Investigators found no written policy or procedures addressing the frequency of inspections for the terminal's bollards.

Massport did produce records from 2007 through 2017 for infrastructure assessments performed by a professional engineering firm for all its maritime facilities, including the Conley Terminal. Also provided was a report of a survey addressing the condition of the terminal conducted in August 2013 by various professional engineering firms.

The survey stated that the condition of berth 11 was “overall fair” and berth 12 was “overall satisfactory.”⁶ The mooring bollards at these berths were determined to be in “fair condition with some scaling.” The concrete around the base of several bollards was found to show signs of “spalling,” which was common in colder climates where moisture in the concrete freezes and then causes delamination or fragmenting of the surface area.

The 2017 assessment of the Massport maritime facilities determined that they “continue to be in generally fair condition overall, unchanged from the FY16 inspection.”⁷ However, that assessment stated “additional deterioration observed” at several locations, including the Conley Terminal, specifically berths 11 and 12. Both berths were classified as being in “poor” general condition, but the report did not mention the conditions of the mooring bollards.

Analysis

The master of the *Helsinki Bridge* was responsible for ensuring that the vessel was safely and securely moored upon its arrival and during cargo operations at the terminal. If he had any reservations about the berth or the safety of his vessel while moored there, he could have made arrangements to shift the vessel. Due to the construction on the pier, only moving the vessel aft would have accommodated the repositioning of the head lines. The master would have had to ensure, nonetheless, that moving aft would have allowed for a suitable lead on the stern lines.

Although the master was not responsible for knowing the condition or load rating of the bollards, he was aware that all five head lines had been placed on one bollard. Distributing the lines to more than one bollard, as the crew intended, would have been the preferred arrangement. However, the placement of the temporary fence on the pier prohibited access to the bollards forward of the vessel's bow. If the berthing arrangement did not meet the master's satisfaction, it was still his responsibility to take some mitigating action, especially considering the onset of

⁶ The term *fair* in the survey describes the following: “All primary structural elements are sound, but minor to moderate defects or deterioration is observed. Localized areas of moderate to advanced deterioration may be present but do not significantly reduce the load-bearing capacity of the structure. Repairs are recommended, but the priority of the recommended repairs is low.” Pare Corporation, *Inspection Findings Report, Conley Terminal, Berth 11–12* (September 2013).

⁷ The terms *good*, *fair* and *poor* describe the general condition of these facilities at the time the inspections were completed. The term *poor* indicates “that major repair or major rehabilitation is required.” HNTB Corporation, *FY17–Massport Facilities Annual Report of Conditions*.

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roughly 40-knot winds forecasted during cargo operations. Such action could have included dropping an offshore anchor underfoot, bringing the bow thrusters online, or calling for tug assistance.

The container facility, Massport, was responsible for furnishing a berth suitable for the vessel, with unobstructed access to a sufficient number of mooring bollards. Having known prior to the containership's arrival the particulars of the vessel (length, beam, tonnage, cargo load/offload) as well as the issues concerning the ongoing construction at the pier, Massport could have consulted with the vessel's representatives and explored whether suitable or alternative mooring arrangements were necessary.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the breakaway of the containership *Helsinki Bridge* and subsequent allision with the Black Falcon Cruise Terminal was the failure of Massachusetts Port Authority to provide suitable berthing arrangements during ongoing construction at the Conley Container Terminal, which resulted in the overloading and failure of a single mooring bollard. Contributing to the accident was the lack of preparation by the vessel's master, who was aware of the less than suitable mooring arrangements and the deteriorating weather forecast but took no mitigating action to address the situation.

Vessel Particulars

Vessel	<i>Helsinki Bridge</i>
Owner/operator	Daisy Ship Holding, S.A. / “K” Line Ship Management (Singapore) PTE, LTD.
Port of registry	Panama City, Panama
Flag	Panama
Type	Containership
Year built	2012
IMO number	9588081
Classification society	NK (Nippon Kaiji Kyokai)
Construction	Steel
Length	1,097 ft (334.6 m)
Draft (average)	34 ft (10.5 m)
Beam/width	150 ft (45.6 m)
Gross/dead-weight tonnage	96,801/96,980
Engine power; manufacturer	96,875 hp/72,240 kW; MAN B&W 12K98ME
Persons on board	34 (24 crewmembers, 10 longshoremen)

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

For more details about this accident, visit www.ntsb.gov and search for NTSB accident ID DCA18FM006.

Issued: November 15, 2018

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).