



National Transportation Safety Board

Marine Accident Brief

Breakaway of Tanker *Harbour Feature* from its Moorings and Subsequent Allision with the Sarah Mildred Long Bridge

Accident no.	DCA13LM014
Vessel name	<i>Harbour Feature</i>
Accident type	Breakaway from moorings; subsequent allision with bridge
Location	Piscataqua River at the Sarah Mildred Long Bridge, Portsmouth, New Hampshire 43° 05.1'N, 70° 45.6'W
Date	April 1, 2013
Time	1324 eastern daylight time (coordinated universal time – 4 hours)
Injuries	None
Damage	Ship: \$1 million; bridge: \$2.5 million
Environmental damage	None
Weather	Northwest winds at 5–10 knots; air temperature 55°F; visibility 10 miles
Waterway information	River waterway, known for rapid tidal currents and hazardous crosscurrents. At the time of the allision, the tide was flooding at 3–4 knots.

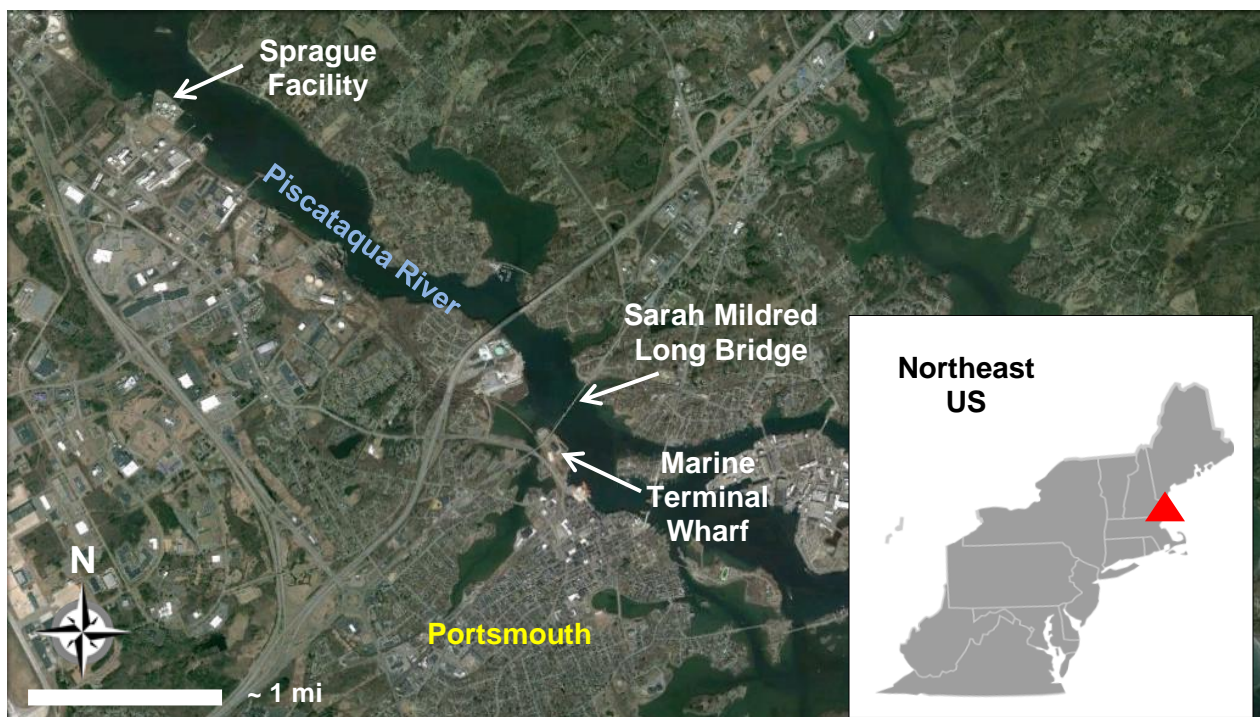
On April 1, 2013, at 1324 local time, the 473-foot-long tanker *Harbour Feature*, with 20 persons on board, allided with the Sarah Mildred Long Bridge in Portsmouth, New Hampshire, after the vessel broke free from its moorings at the New Hampshire State Port Authority, Marine Terminal Wharf. No injuries or pollution resulted from the accident. The bridge sustained \$2.5 million in damage; the *Harbour Feature* sustained \$1 million in damage.



The *Harbour Feature* under way. (Photo by dl3lat, at www.marinetraffic.com)

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The *Harbour Feature* had arrived in Portsmouth the previous day, March 31, 2013. With a Portsmouth pilot on board, the ship had transited up the Piscataqua River and docked at the Sprague Energy River Road Terminal Docking Facility, located about 3 miles upriver from the accident site, to load a cargo of tallow (an animal fat commonly used in candles and soap). The pilot had given the master the Portsmouth Pilots' *Recommendation to Master for Safe Mooring in Piscataqua River*, an information card that warned of "3–5 knots of current" in the waterway. The card also warned of the importance of skilled line tending when moored in the Piscataqua River, stating: "equal tension or equal weight on all ropes at all times; mooring winch brakes shall have a holding near the strength of the line; if uncomfortable with situation, call the Pilot. Leave existing lines alone. Put out more lines." In addition, the *United States Coast Pilot* for the Portsmouth area states that, "Due to strong ebb and flood tidal currents on the Piscataqua River, a mooring plan will be provided by the Portsmouth Pilots upon boarding for the intended terminal, and masters should be particularly vigilant in minding and tending to their vessel's moorings." Finally, the vessel's *Fleet Nautical Handbook* warned in general of mooring winch brake failures and the potential of the vessel breaking away from its berth in strong currents. Because of these warnings, the master decided to put out an extra line on the ship, for a total of 11, after the *Harbour Feature* was moored at the Sprague facility about 1130 on March 31.



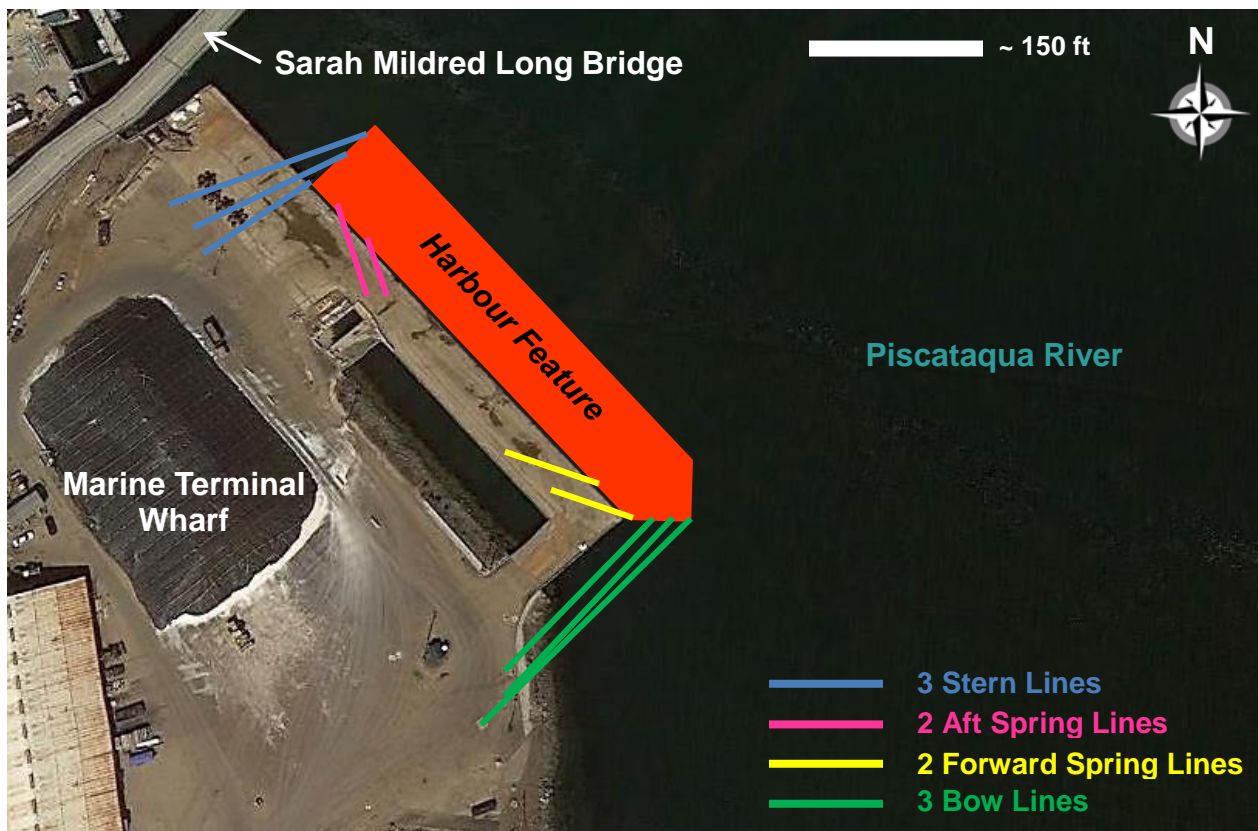
Aerial view of the Piscataqua River in Portsmouth. The Sprague Facility and the Marine Terminal Wharf, between which the *Harbour Feature* was shifted, are marked, as is the Sarah Mildred Long Bridge. (Background by Google Earth)

The crew began loading cargo about 1300 that afternoon and finished at 0542 on April 1, with 3,700 tons of tallow loaded onto the ship. Because refueling was not allowed at the Sprague facility, the sailing plan next called for the *Harbour Feature* to be shifted (moved) to the New Hampshire State Port Authority's Marine Terminal Wharf, about 3 miles downriver, for a brief stop to refuel the ship prior to departing for the United Kingdom. The shifting of the *Harbour Feature* from the Sprague facility to the Marine Terminal Wharf was timed so that the ship would be under way during slack water at 1153.

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The master told investigators that the *Harbour Feature*'s tides and current software calculated a maximum tidal current of 2.7 knots for the shift. About an hour later, at 1300, the maximum tidal current was to be 3.4 knots, according to the software calculation.

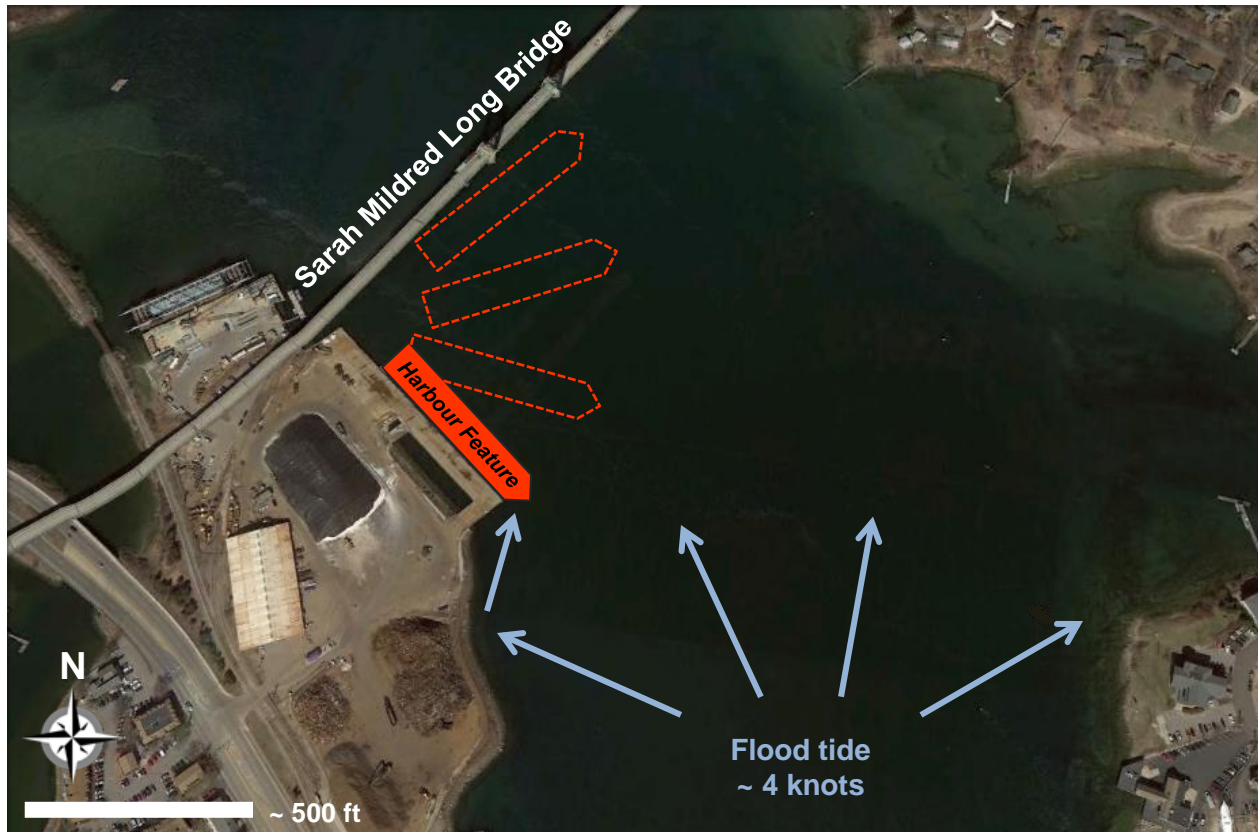
At 1115 on April 1, the same Portsmouth pilot from the previous day boarded the *Harbour Feature* to shift the vessel downriver. The 3-mile transit was uneventful, and at 1236 the *Harbour Feature* was moored starboard-side-to at the Marine Terminal Wharf. Ten of the ship's 23 total mooring lines were used: three bow and two spring lines forward; three stern and two spring lines aft. Each line was 5.5 inches in diameter and had a breaking strength of 40 tons. Because the *Harbour Feature* had a 29-foot draft at the stern and the wharf had a depth of only 30 feet at its west end, the pilot docked the ship farther down the wharf toward the east. The ship's bow extended 30 feet beyond the east end of the wharf and pointed downriver. The vessel's stern was positioned about 150 feet from the Sarah Mildred Long Bridge. The pilot disembarked at 1242.



Aerial view of the Marine Terminal Wharf, with an overlaid orange-red icon representing the *Harbour Feature*. Also overlaid are 10 colored lines, extending from the ship to the wharf, that represent the mooring line arrangement on the day of the accident. (Background by Google Earth)

During flood tide in the Piscataqua River, water rushes up the river and deflects off the river banks causing hazardous crosscurrents. Because the *Harbour Feature*'s bow extended beyond the eastern end of the wharf, the deflecting flood current pushed the bow away from the dock and increased the strain on the vessel's mooring lines.

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Aerial view of the Marine Terminal Wharf on the Piscataqua River. The overlaid blue arrows illustrate the direction of the strong flood current. The overlaid orange-red icons illustrate how the *Harbour Feature* moved toward the bridge after the mooring lines parted. (Background by Google Earth)

Shortly after 1300, one of the *Harbour Feature*'s able seamen was conducting a gangway watch as part of his roving patrol, and the mate-on-watch was on the bridge completing a pre-sailing message. At 1313, the gangway watch reported over the ship's radio that the forward mooring lines were tight. He then ran to the bow to investigate and saw a large amount of dust and smoke emanating from the brakes of the mooring line drums. On hearing the radio transmission, the chief officer and the boatswain proceeded to the bow while the master went to the bridge and was briefed by the second officer and the chief engineer. They then ordered via the vessel's public address system manning of the mooring stations forward and aft. The bridge team tried using the ship's bow thrusters to push the vessel toward the dock; however, this had no effect.

As the *Harbour Feature*'s bow was pushed into the river, the three mooring lines that were secured to the bits of the vessel (both of the forward spring lines and one of the aft spring lines) parted. As the mooring winch brakes slipped in place, all remaining mooring lines ran free off the drums and fell into the water.

By 1324, the bridge team had ordered both anchors deployed in an attempt to keep the ship at the dock. At this point, the crew at both the forward and aft mooring stations had reported that all of the 10 mooring lines had now run off the vessel and fallen in the water, and the ship was adrift in the river. The master tried to gain control of the ship by using the main engine and rudder. The anchors did slow the drift, but the *Harbour Feature* was carried by the current and at 1327, the vessel's port side struck the Sarah Mildred Long Bridge.

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The *Harbour Feature* pressed against the Sarah Mildred Long Bridge after the allision. Two responding towing vessels, the *Mary M. Coppedge* and the *Drum Point*, can be seen on the ship's forward starboard side. (Photo by the Coast Guard)

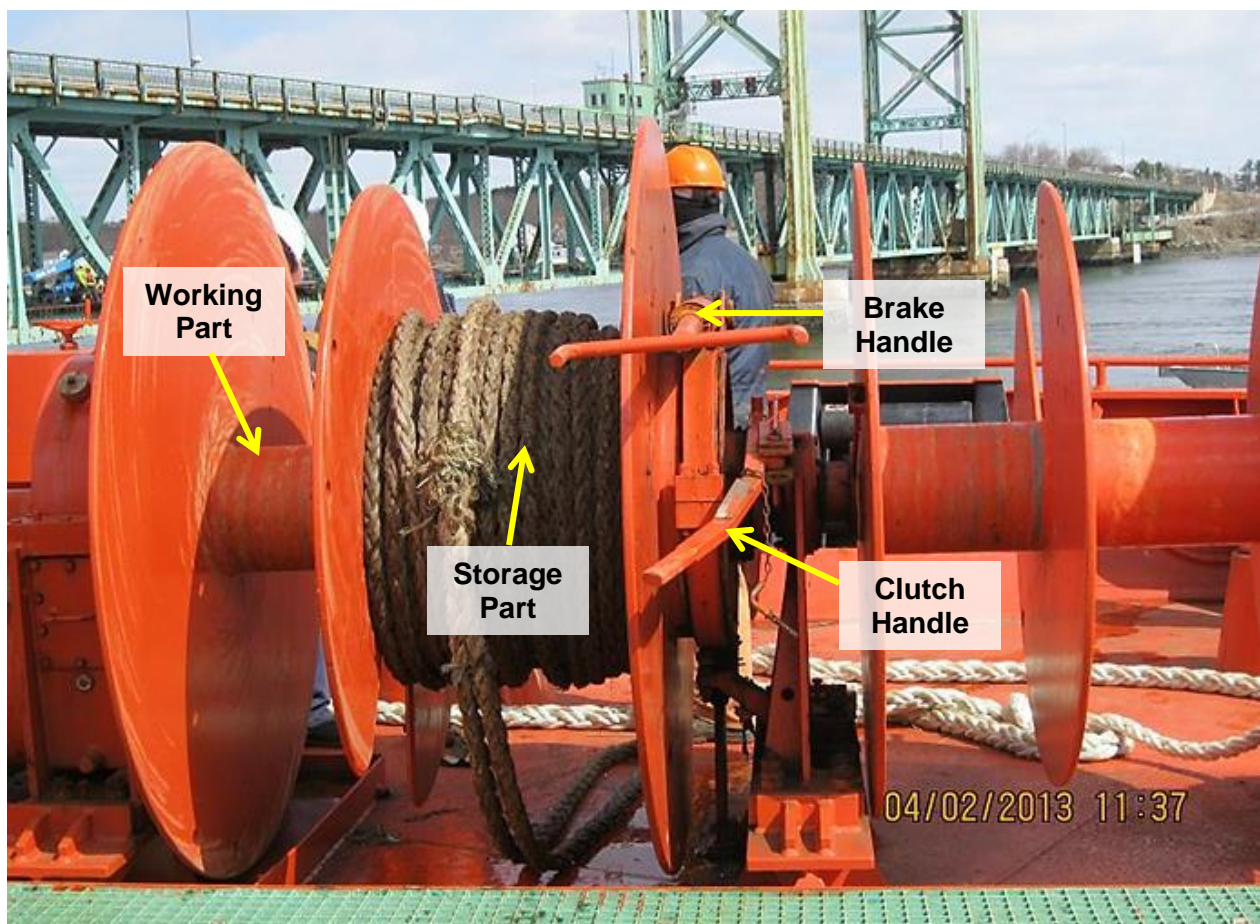
The crew began sounding tanks to check for flooding. At 1337, the bridge tender notified the United States Coast Guard that the ship had drifted into the bridge and that two towing vessels were in route to assist. At 1345, the first towing vessel arrived on scene with the pilot who had assisted the ship over the past couple of days. The pilot noted that the strong flood current was pressing the fully loaded ship firmly against the bridge and that the vessel was not in danger of moving at that time. Shortly thereafter, the Coast Guard and the pilot boarded the *Harbour Feature* and discussed salvage plans with the master. Until the current relented, the ship would be firmly pressed against the bridge and unable to be moved. That day, high water was at 1604 and high water slack was at 1749. At slack water, the anchors were heaved in and the vessel got under way with the two assisting towing vessels. At 1842, the ship was re-moored port-side-to (bow pointed upriver) at the Marine Terminal Wharf using 18 mooring lines: four bow, three breast, and two spring lines forward; five stern, two breast, and two spring lines aft, and a tug boat on the starboard side pushing the ship against the wharf.

Drug and alcohol testing was completed on all pertinent crewmembers; the results were negative. Damage to the *Harbour Feature* was estimated at \$1 million and included total destruction of the freefall lifeboat, penetration with flooding into a port wing ballast tank, extensive damage to the frames in several portside compartments, and a hull breach above the waterline into the inert gas generator room. Damage to the Sarah Mildred Long Bridge was estimated at \$2.5 million and caused the bridge to be closed to vehicle traffic for 6 weeks while

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emergency repairs were being made to three structural members. No injuries or pollution resulted from the accident.

The *Harbour Feature* was equipped with eight non-auto-tension split mooring winches, four forward and four aft, with the mooring lines on the winch drums set on the brake. The winch brakes are designed to hold 80 percent of the mooring lines' minimum breaking load (MBL) but are operationally set to hold 60 percent of the MBL. A satisfactory test of the *Harbour Feature*'s mooring winch brake holding capacity (BHC) had been conducted on February 26, 2013. During the BHC test, the chief officer had inspected each mooring brake band and noted that about 3 millimeters of the asbestos brake lining remained. The manufacturer's operations manual stated that the brake lining should be replaced when worn down to 3 millimeters. However, the brake lining had not been replaced when the accident occurred, indicating that the mooring winch BHC may have been less than the operational setting. The heat that resulted from the mooring lines' rapidly paying out disintegrated the brake lining, and it could not be determined how thick the brake lining was before the accident.



The *Harbour Feature*'s mooring line winch and storage drum assemblies photographed the day after the accident. The Sarah Mildred Long Bridge is visible in the background. (Photo by the Coast Guard)

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Probable Cause

The National Transportation Safety Board determines that the probable cause of the breakaway of the *Harbour Feature* from its moorings and subsequent allision with the Sarah Mildred Long Bridge was the inadequate mooring arrangement made by the master and the pilot for the vessel's location and the prevailing tidal conditions.

General Tips for Safe Mooring

When mooring a ship at a dock, pay close attention to the following factors:

- Tidal currents – their scheduled peak time, direction, and speed
- Weather conditions, both present and forecasted
- Amount and type of vessel traffic in the area
- Ship's position at the berth – does the bow or stern extend past the dock?
- Anticipated changes in draft or trim of vessel while alongside dock
- Number, strength, and general condition of mooring lines/wires, winch brakes, and dockside bollards
- Interval of mooring patrols, based on the factors listed above

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Vessel Particulars

Vessel	<i>Harbour Feature</i>
Owner/operator	TB Marine Shipmanagement GmbH & Co. KG
Port of registry	Madeira
Flag	Portugal
Type	Tanker (chemical/products)
Year built	2011
IMO number	9473092
Construction	Double steel hull
Length	473.1 ft (144.2 m)
Draft	29.5 ft (9 m)
Beam/width	75.5 ft (23 m)
Gross and/or ITC tonnage	11,880 ITC tons
Engine power; manufacturer	8,448 hp (6,300 kW); Diesel; Maschinenbau Kiel GmbH (MaK)
Persons on board	20 crewmembers

For more details about this accident, visit www.nts.gov/investigations/dms.html and search for NTSB accident ID DCA13LM014.

Adopted: November 12, 2014

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 49 *United States Code* 1131. 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.” 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. 49 *United States Code*, Section 1154(b).
