



National Transportation Safety Board

Marine Accident Brief

Allision of Container Vessel Rickmers Tokyo with Pier 11 at Port Richmond, Philadelphia, Pennsylvania

Accident no.	DCA-12-LM-004
Accident type	Allision
Vessel	<i>Rickmers Tokyo</i>
Location	Delaware River, Pier 11 at Port Richmond, Philadelphia, Pennsylvania 39°58.36' N, 75°6.58' W
Date	December 23, 2011
Time	1909 eastern standard time (coordinated universal time –5 hours)
Damage	<i>Rickmers Tokyo</i> : \$546,391 Pier: \$121,800
Injuries	None
Environmental damage	None
Weather	Clear, winds 9 knots northwest (310°), air temperature 48° F, skies 50% overcast
Waterway characteristics	Delaware River in accident area: approx. 1,900 feet wide with navigable channel 400 ft. wide
Current	Ebbing, from 1.5 knots when vessel got under way to 1.8 knots at time of allision

While transiting outbound in the Delaware River north of downtown Philadelphia, a river pilot conning the multipurpose container vessel *Rickmers Tokyo* missed the turn in the channel and allided with Pier 11 about 1909 on December 23, 2011. The pilot, who was not wearing his required corrective eyewear, lost situational awareness with regard to the vessel's location and did not use all available navigation equipment to fix its position.



The motor vessel *Rickmers Tokyo* under way with varied cargo.
(Photo by www.rickmers-linie.com)

The *Rickmers Tokyo* arrived in Philadelphia on December 22, 2011, and docked port side to the Tioga Marine Terminal, facing up the Delaware River. Upon completion of cargo operations at 1706 on December 23, the crew prepared to get under way to Antwerp, Belgium. Both a river pilot and docking pilot boarded the vessel, while the tug *Reid McAllister* was present to assist in undocking and rotating the ship for the outbound passage downriver. At 1848, the docking pilot directed the movement of the vessel away from the berth using both the bow thruster and tug to swing and then pivot the vessel around to the opposite heading in the river. The vessel sailed with a deep draft of 29 feet 8 inches, and no other ship traffic was in the area.

After the river pilot issued several rudder commands at 1907 that failed to adjust the vessel's heading for the first course change in the channel, which called for a 17.5° turn to port, the vessel left the navigation channel to starboard. Noticing a dark shape ahead, the pilot and then the master ordered port rudder commands to move the ship away from the right bank, but the *Rickmers Tokyo* struck Pier 11 about 1909. (A detailed description of the pilot's commands and the vessel's transit is provided in the box on the next page.)

Prior to and during the allision, both the bosun and the second officer were stationed on the foredeck near the anchors. The bosun assisted with the disembarkation of the docking pilot and returned to the bow before the allision. The bosun commented to the second officer that the vessel was approaching the shore too closely, and at about 50 meters from contact the second officer radioed the master with this warning. About the same time, the second officer heard the master command "hard port" over his hand-held radio as both he and the bosun moved to the port side of the bow for safety. The bosun noted that it "was so dark to starboard . . . you can't really see the shore," and the second officer said assessing the degree of hull damage was difficult when he began searching over the side because "that portion of the river is dark."

The river pilot alerted the Coast Guard Sector Delaware Bay Command Center via cell phone about 15 minutes after the accident that the vessel had allided with a pier downstream of Tioga Marine Terminal but said the vessel was undamaged.

By 1938 the crew reported to the master that the vessel had a large hole at the waterline and had ruptured a ballast tank. The master wanted to anchor, and the river pilot suggested the Marcus Hook Anchorage below downtown Philadelphia. At 2205, the vessel anchored at this location, approximately 22 miles from the allision, and the river pilot disembarked the vessel.

The *Rickmers Tokyo* had centerline cranes forward of the bridge. To allow for an unobstructed view directly forward, the bridge was offset to starboard, which partially obstructed the view to port but not to starboard. The bridge console included two radar/automatic radar plotting aid (ARPA) displays designated port and starboard and located directly to each side of the helm position. (See radar screen capture below.) The crew reported that from 1859 to the allision, the river pilot remained seated in front of the port radar display and navigated by looking out the bridge windows and using his personal piloting unit (PPU), a laptop computer loaded with navigational software. The pilot said the night was "pitch black and moonless" but also commented in an interview that "visibility was perfect."

Sequence of Events

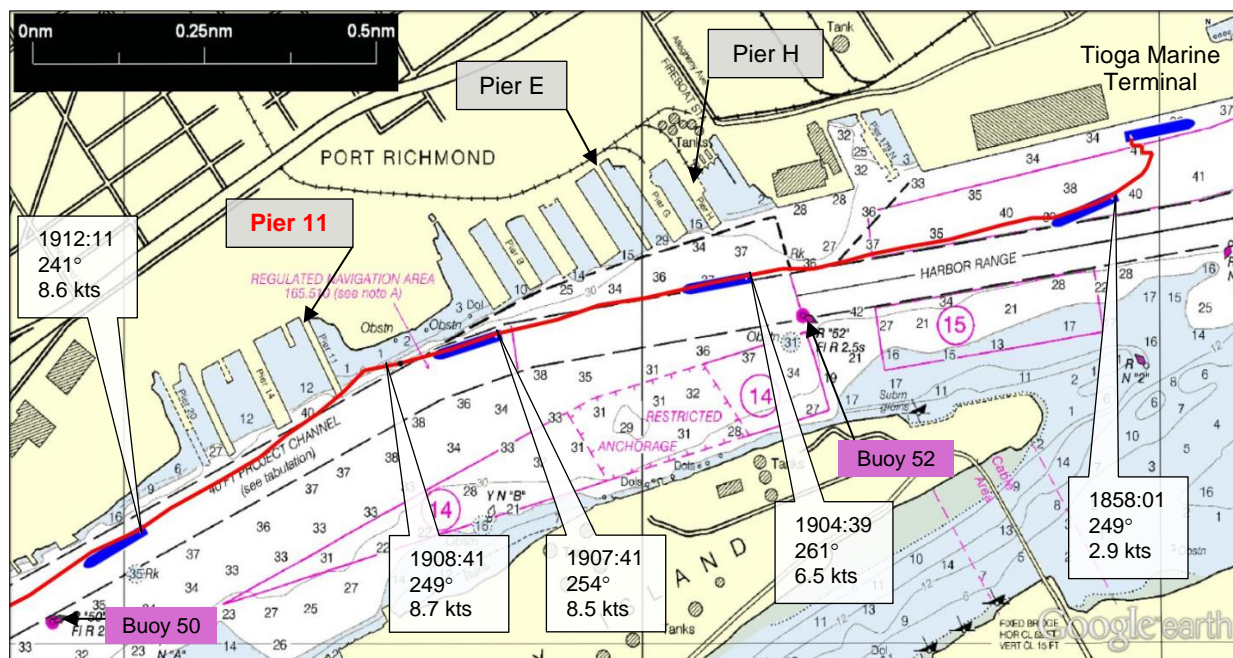
The *Rickmers Tokyo* voyage data recorder (VDR) included bridge audio tracks and speed and position data, which were included in the US Coast Guard report on the accident. The docking pilot said he transferred the conn to the river pilot at 1858:05 with “the bow of the ship . . . heading just inside buoy 52,” the rudder midships, the course steady at about 250°, and the engine at dead slow ahead. In talking with the docking pilot during turnover, the river pilot said he intended to stay to the right in the channel. The docking pilot exited the bridge and disembarked the vessel to the attending tug boat, which did not accompany the vessel for the remainder of the transit.

The chart below indicates the position of the *Rickmers Tokyo* and the time, heading, and speed of the vessel at selected points in its transit.

The ship was at the northern edge (right side) of the channel and heading 258°, transiting a section of the Delaware River channel designated as the Harbor Range, which had an outbound course of 260.5°. The river pilot then had the helmsman steady up on course 257° and ordered an increase in speed to slow ahead. Beginning at 1906:29 the river pilot issued several rudder orders mixed with three course commands, 257°, 255°, and lastly 254° at 1907:33, to adjust the ship's heading.

Directly ahead was a 17.5° port turn at Port Richmond into the next outbound channel section to a course of 243°. Similar to the previous leg of the channel, this leg had numerous piers reaching as close as 50 feet from the right side of the 400-foot-wide navigation channel. By 1908:17 the river pilot had missed the turn, the vessel had departed the navigational channel to starboard, and the pilot noticed a black shape ahead of the vessel. At 1908:25 the river pilot ordered successive rudder commands of port 10° and port 20° to move the vessel away from the right bank.

At 1908:21 the master went to the starboard bridge wing to better ascertain the nature of grey “tree” shapes he saw ahead and at 1908:41, after the river pilot's port 20 command, ordered “hard to port” in an attempt to avoid hitting Pier 11. The river pilot next ordered half ahead to increase flow across the rudder. After the forward starboard side of the vessel struck the end of Pier 11 at approximately 1909, he issued a series of starboard rudder orders in an effort to prevent additional damage by swinging the vessel's stern away from the pier end. Once clear, the river pilot ordered an engine speed reduction back to slow ahead.

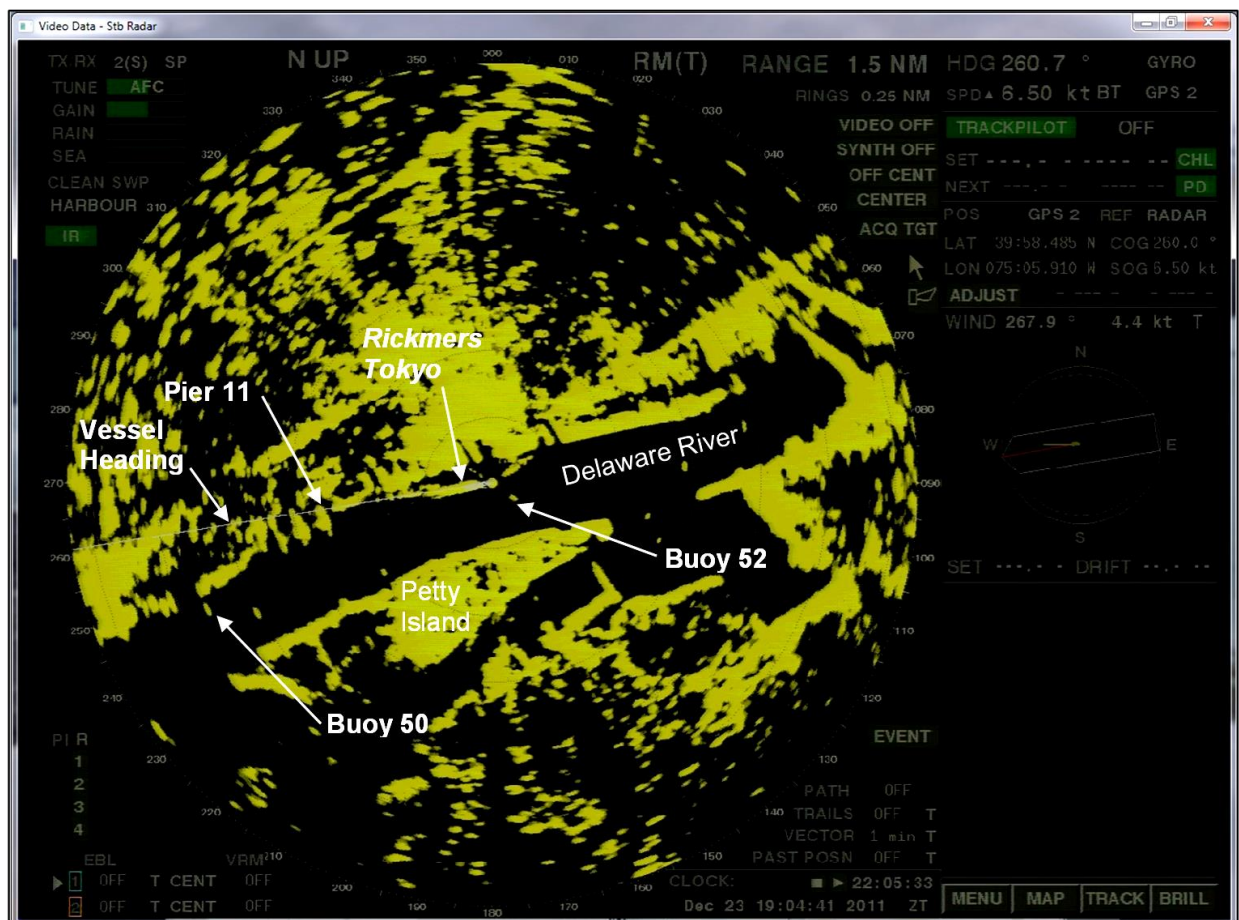


Portion of NOAA chart 12313, Delaware River, Philadelphia and Camden Waterfronts, including the allision location. Labels indicate the scaled *Rickmers Tokyo* in blue and the trackline in red as well as time, heading, and speed data for the vessel at selected points in its transit.

Both Pier 11 and adjacent piers were abandoned with no installed lighting. With the low level of ambient light, the piers lacked contrast with the river and the shore. Additionally, the city lights of downtown Philadelphia were directly behind this pier set when proceeding downriver, producing background lighting. With the exception of the trees on the pier, which the master noticed before taking evasive action, the piers had a relatively low profile against the city lighting.

The river pilot stated that the tidal current effect was greater than he had anticipated, but the recorded current was typical. He also questioned the accuracy of the port radar heading flasher to the master shortly after the allision, to which the master replied, "It is correct." The river pilot's subsequent written statement described the port radar heading indicator as being off approximately 6° to the right of the actual vessel heading. However, testing after the accident found it to be functioning properly to within 1°.

After taking the conn and transiting the Harbor Range at 260.5°, the river pilot issued only course changes to 254° before taking action to avoid Pier 11, but a change to at least 243° was required to begin the next channel leg. Radar images taken from the VDR clearly showed the vessel heading, river bank, piers and buoys along the channel minutes before the allision with Pier 11.



***Rickmers Tokyo* starboard radar VDR screen capture at 1904:41 with relevant landmarks, navigation aids, and geographic features identified.**

The river pilot's written statement indicated he intended to pass buoy 52 "close on the port side" and after passing it prepare to "turn to port in order to head for buoy 50." However, he was further to starboard in the channel than expected, and the allision occurred before the vessel turned to 243°. In the same statement, he said he believed the "finger pier which was struck had

formerly been known as Pier E.” Pier E is approximately 1,000 yards upriver from Pier 11. The master commented in an interview the day after the accident that he thought they struck Pier H, which was approximately 1,200 yards upriver from Pier 11. The pilot’s perception that the allision location was about 0.5 nautical mile from the actual accident site indicates a significant error on his part, especially considering that he was navigating a narrow channel within a constrained river.

The *Rickmers Tokyo* bridge crew at the time of the allision consisted of the river pilot, master, chief officer and a helmsman. The second officer and bosun were stationed on the bow. Following the accident, nine *Rickmers Tokyo* crewmembers, including the bridge and bow teams, and the river pilot were tested for illegal drugs and alcohol. All test results were negative.

The river pilot began piloting on the Delaware River in 1970 and at the time of the accident was 69 years old. His sleep/wake/work history indicated his sleeping schedule was consistently between 2000 and 0800 the five nights before the accident. He had not been on duty during the 96 hours before his arrival at the pilot office in Philadelphia at 1500 on the day of the accident voyage. Given the length and regularity of his sleep opportunities, he was likely not fatigued at the time of the accident.

Although the river pilot had prescription corrective lenses for nearsightedness, both he and the bridge crew stated that he did not wear them at any time during the transit up to the allision. At the time of the accident, he was navigating under the authority of his state pilot license. He was required by his state pilot licensing authority, the Delaware Board of Pilot Commissioners, to hold a valid Coast Guard first-class pilot license and therefore was required to adhere to all Coast Guard medical requirements. His Coast Guard-issued federal pilot license required that he wear his corrective lenses while operating under the authority of that license. As the river pilot’s uncorrected vision was 20/50, not using his glasses when looking ahead reduced his ability to perceive distant visual cues on a dark night.



Starboard side damage to the *Rickmers Tokyo*, with inset image showing close-up of sheet steel piling stuck in the aft portion of the hull penetration.

The *Rickmers Tokyo* allision with Pier 11 caused the vessel’s shell plating to be torn open as the starboard side of the ship just above the waterline scraped along the southeast corner of Pier 11. Damages were as follows:

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- *Rickmers Tokyo*: Approximately 3-foot by 92-foot open tear to the starboard bow. Along this length the internal frames were damaged and the shell plate was set inward 3 feet, penetrating the no. 1 and no. 2 ballast tanks and leaving them open to the sea. Additional damage to the shell plate and internal frames in way of the starboard side water ballast tanks no. 4 and no. 5 above the waterline also occurred.
- Pier 11: 10-foot by 20-foot section of sheet steel bulkhead piling torn away.

According to the vessel operator, the initial repair cost for damage to the vessel was \$546,391. A surveyor's report estimated the damage to the pier was \$121,800.



Birdseye view of Pier 11 vicinity with inset image showing the damage to the southeast corner of Pier 11's corrugated steel pilings. The area on the right side of the pier that appears white is damage due to the allision.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the allision of the multipurpose container vessel *Rickmers Tokyo* with Pier 11 in the Delaware River was the river pilot not executing the turn at Port Richmond due to his lack of situational awareness regarding the vessel's position in the channel and his inadequate use of all available navigation equipment. Contributing to the allision was the river pilot's failure to wear his corrective eyewear, which was required and would have assisted with distant visual cues on the dark evening.

Vessel Particulars

Vessel	<i>Rickmers Tokyo</i>
Owner/operator	Rickmers Tokyo Schiffahrtsgesellschaft mbH & Cie. KG
Flag state	Marshall Islands
IMO number	9235995
Builder	Xiamen Shipbuilding Industry, China
Year built	2002
Construction	Steel
Length overall	632.9 ft. (192.9 m)
Breadth	91.2 ft. (27.8 m)
Depth	50.9 ft. (15.5 m)
Draft	36.8 ft. (11.2 m)
Displacement	30,116 long tons (30,599 metric tons)
Gross tonnage (ITC^a)	23,119
Propulsion type	Direct, Slow-speed Diesel, Single Screw
Main engine	MAN B&W 7S60MC-C
Main engine power	21,168 hp (15,785 kW) at 105 rpm
Service speed	18 knots
Bow thruster	1,224 hp (900 kW)
Container capacity	1,864 20-foot equivalent units max.
Crew complement	27

^a Tonnage according to International Tonnage Convention.

For more details about this accident, visit <http://www.nts.gov/investigations/dms.html> and search for NTSB accident ID DCA12LM004.

Adopted: May 28, 2013

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 provided by the US Coast Guard from its informal investigation of the accident. The NTSB did not conduct its own on-scene investigation.