



# National Transportation Safety Board

Washington, D.C. 20594

## Railroad Accident Brief

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**Accident No.:** DCA-06-FR-003  
**Location:** Quantico, Virginia  
**Date:** January 5, 2006  
**Time:** 6:44 a.m. eastern standard time<sup>1</sup>  
**Railroad:** Virginia Railway Express train on CSX Transportation property  
**Damage:** \$425,000  
**Injuries:** 9  
**Fatalities:** 0  
**Type of Accident:** Derailment

### Accident

On January 5, 2006, about 6:44 a.m., a northbound Virginia Railway Express commuter train, 304-05, operating on CSX Transportation's (CSX's) RF&P Subdivision derailed three passenger cars and a locomotive at Possum Point near Quantico, Virginia. Seven passengers and two crewmembers required medical attention.

The train had originated in Fredericksburg, Virginia, and was destined for Washington, D.C. It was a scheduled commuter train with one locomotive and six passenger cars, and the train crew consisted of an engineer, a conductor, and an assistant conductor. According to the documentation and to the crewmembers, the crew had boarded the train at Fredericksburg, where they had inspected the locomotive, reviewed the paperwork, held a job briefing, and performed a brake test.

Before the accident, the train had stopped at several stations, including Quantico, the last station before the accident. The train was in "push-pull" operation. The engineer was operating the train from the cab control car, in the lead of the train. The locomotive was at the rear of the train. About 520 passengers were aboard.

After departing Quantico, the engineer increased the train's speed while traversing the turnouts at Quantico and traveling single track over a bridge. During the approach to Possum Point, the train's movement was governed by the signals at Quantico and at Possum Point. Both signals had displayed "limited clear." (A "limited clear" means the train's speed should not be more than 45 mph. According to CSX's timetable, the maximum authorized train speed for a

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<sup>1</sup> All times in this brief are eastern standard time.

commuter train that is operating through a turnout at either Quantico or Possum Point is 45 mph.) The train traveled over the bridge at 44 mph, and at Possum Point it took a diverging route over a power-operated switch onto No. 2 main.

The crewmembers said that the trip had been “uneventful” up to Possum Point. The engineer and conductor stated that they had not seen any track anomalies or felt anything unusual as they left the single main track and traversed the turnout. As the train was moving over the turnout, the fourth car derailed in the switch point area. Because of the resulting damage to the turnout and the misalignment at the frog<sup>2</sup> area, the fifth and sixth cars and the locomotive derailed when they reached it. The lead car stopped about 800 feet north of the switch point. The derailed equipment remained upright when it came to rest.

The crew immediately began communicating with the CSX dispatcher and a local 911 operator. Emergency responders arrived in about 15 minutes. Seven passengers and two crewmembers were injured. The crewmembers decided the passengers should shelter in place and wait for a rescue train.



**Figure 1.** Looking north at resting position of train.

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<sup>2</sup> A frog is a device on intersecting railroad tracks that permits wheels to cross the junction.

## Investigation

### Location of Accident and Description of Track

CSX engineering personnel are responsible for maintaining and inspecting the RF&P Subdivision, which includes the switch at Possum Point (milepost 79.7). The CSX estimated that for 2005 the gross tonnage for Possum Point was about 52 million, an amount that suggests high wear for switch components, especially for a reverse switch point.

The Possum Point turnout was made of continuous welded rail, 39-foot welded switch points, and stock rails fastened to wooden crossties with appropriate switch apparatus. Investigators found wheel markings that began about 22 inches from the end of the left switch point. The markings continued along the top of the stock rail and “fell down” between the field side of the left switch point and the gage side of the stock rail. The markings continued northward toward the frog. The investigators determined that the lead axle of the fourth passenger car derailed first and, in the process, damaged the track and caused the track structure to shift at the frog. Consequently, when the wheels of the trailing passenger cars and the locomotive reached the same spot, they also derailed.



**Figure 2.** Looking north at the reverse, or left, switch point, which was the point of derailment.

Before the accident, the left switch point was unusually chipped or worn, and several pieces of the top edge of the switch point were broken. Because the edge was broken, the left wheel of the fourth passenger car had “ramped up” onto the top of the stock rail. After the accident, investigators found that a much larger piece of the switch point, about 66 inches from the end of the switch point, was broken. However, they determined that the break had been caused by the accident; a derailed wheel had fallen between the switch point and stock rail.

## **Maintenance and Inspection History**

The turnout at Possum Point requires a monthly on-the-ground inspection. According to CSX’s track and switch inspection records, the turnout had been inspected as required. However, according to the engineering personnel and to the track inspection records, between February and October 2005, the turnout had been put under a slow order on four different occasions,<sup>3</sup> each time because the switch point needed welding.

The track inspector further explained that on two more recent occasions (December 19, 2005, and January 2, 2006), he had imposed a slow order because the reverse switch point was worn and/or chipped. On December 19, both he and the welder had told the roadmaster that several portions of the point were chipped, that extensive welding was necessary, and that the switch point and stockrail would have to be replaced. The roadmaster called the vendor and ordered a replacement switch point and stock rail. In the meantime, the welder repaired the switch point, and the slow order was removed.

On January 2, the track inspector placed a 10-mph slow order on the turnout because a piece of metal had broken out of the left point. After the point was repaired, he lifted the order. On January 3, the vendor told the roadmaster that the switch points would arrive in the next couple of days. On January 5, the day of the accident, the replacements arrived, but after the train had derailed.

The turnouts at Possum Point and Quantico are similar. At both places, the trains are routed in a similar fashion from a single track to multiple tracks. Both places are subjected to about the same amount of wear and tear. In spring 2005, the lead switch at Quantico had maintenance issues similar to those at Possum Point. The area was covered by a slow order until the turnout had been permanently repaired with a new switch point and stock rail.

Throughout 2005, maintenance personnel had had several indications that the Possum Point switch point was seriously worn. While the turnout problems at Quantico were adequately handled, the Possum Point turnout problems were not. The switch point at Possum Point was neither replaced nor protected adequately by a speed restriction.

## **Postaccident Actions**

Immediately after the accident, CSX verbally instructed its engineering personnel that all mainline switch point welding was prohibited. CSX also verbally instructed its roadmasters that

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<sup>3</sup> February 26, April 4, May 2, and October 17, 2005.

any deficient switch point should be kept out of service until its replacement could be installed. The company began stocking switch points at various key locations on its divisions so that deficient switch points could be replaced more quickly. On February 15, 2006, CSX formally updated its welding manual:

**Main track switch points are not to be repaired by any welding process.** In the event that it becomes necessary to repair a switch point in an emergency situation, a 10 mph speed restriction must be placed on the turnout until the point is replaced.

## **Probable Cause**

The National Transportation Safety Board determines that the probable cause of the January 5, 2006, derailment of Virginia Railway Express train 304-05 near Quantico, Virginia, was an excessively worn and chipped switch point, which caused the lead truck of the fourth passenger car to derail. Contributing to the accident was CSX's delay in replacing a switch point that had been repeatedly identified as deteriorating.

**Adopted: November 20, 2006**