

RAILWAY OCCURRENCE REPORT

DERAILMENT

VIA RAIL INC.

TRAIN NO. 15

MILE 86.07, MONTMAGNY SUBDIVISION

SAINT-FRANÇOIS, QUEBEC

23 FEBRUARY 1995

REPORT NUMBER R95Q0014

The Transportation Safety Board of Canada (TSB) investigated this occurrence for the purpose of advancing transportation safety. It is not the function of the Board to assign fault or determine civil or criminal liability.

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Summary

VIA Rail Inc. (VIA) passenger train No. 15 derailed car VIA 8709, a sleeper car, and sideswiped an empty boxcar at Saint-François, Quebec, Mile 86.07 of the CN North America (CN) Montmagny Subdivision. There were no injuries.

Ce rapport est également disponible en français.

Other Factual Information

VIA passenger train No. 15, destined for Montreal, Quebec, departed Halifax, Nova Scotia, travelling westward. As the train passed over the east crossover switch at Mile 86.07 (the switch), leading to a team track, the crew did not notice anything unusual. Shortly thereafter, the locomotive engineer was notified by an on-board service member that the last car in the train, VIA 8709 (the 11th car from the head end), had derailed. The locomotive engineer immediately applied the train brakes in emergency and the train came to a stop approximately 5,460 feet west of the switch. After conducting the necessary emergency procedures, the crew determined that VIA 8709 had derailed, and that a boxcar standing in the team track had been sideswiped by VIA 8709. The derailed car sustained extensive damage and the boxcar sustained minor damage. Approximately 5,460 feet of track experienced minor damage. The switches at both the east end and west end of the team track were extensively damaged. The seven passengers occupying the derailed car continued their trip in forward coaches.

The train consisted of one locomotive, four coaches, five sleeper cars, one diner car and one baggage car. There were 195 passengers and 13 on-board service personnel on the train. At the point of derailment, the subdivision was a single main track paralleled by a 1,016-foot team track. The authorized timetable speed is 80 mph for passenger trains and 60 mph for freight trains. The traffic in this area is controlled by the Centralized Traffic Control System authorized by the Canadian Rail Operating Rules (CROR) and supervised by a rail traffic controller posted in Montreal, Quebec.

The event recorder data indicated that the train experienced an in-train emergency brake application while it was travelling at a recorded speed of 86 mph.

The temperature was minus eight degrees Celsius. The skies were clear and the winds calm.

The track components were in good condition through the derailment area. The track was last inspected by Hi-rail on 22 February 1995 by the assistant track supervisor; no irregularities were noted. Wheel flange and wheel tread marks were evident on the ties of the switch.

It was noted that the switch points were unsecured and that the switch had broken at the bolt hole where the spindle connects to the switch handle. The spindle was sent to the TSB Engineering Laboratory for analysis. The analysis (LP 39/95) revealed that the spindle broke when a fatigue crack in the bolt hole grew to the extent (85 per cent of the fracture surface) that the spindle could no longer withstand normal operational loading. Corrosion pitting and multiple fracture origins consistent with torsional loading were observed on the inside bore surface. The crack had grown over a considerable

period of time. The area of the bolt hole was not observable until the switch stand spindle housing was removed.

There are no inspection procedures currently in place for testing the integrity of switch stand spindles which are enclosed in a housing and not readily accessible. It is estimated that the spindle had been in operation for 30 years.

The switch was used on 18 February 1995 by an eastward freight train which set off an empty boxcar onto the team track and on 22 February 1995 by a welding gang while clearing a train. On both occasions, the switch functioned as intended.

An inspection of VIA 8709 did not show any evidence of pre-derailment equipment defects. Similarly, no tie or rail markings were evident up to Mile 86.07.

Analysis

The train operation conformed to company instructions and government safety standards. The 6-mph overspeed is not considered causal to the accident.

Since the switch was functioning as expected when last used on 22 February 1995, it is believed that the spindle broke under train No. 15. Once the spindle broke, it allowed the switch points to move freely which resulted in the wheels of VIA 8709 following the diverging route towards the team track and derail.

The vibrations and lateral forces exerted on the bolt hole as the train passed over provided enough force to further a pre-existent fatigue crack to the point where the spindle broke free. A routine inspection (removing the housing of switch stands) would have revealed the deteriorated condition of the bolt hole and alerted maintenance crews of the weakness.

Findings

1. With the exception of a 6-mph overspeed, the train was operated in accordance with company instructions and government safety standards. The overspeed did not cause or contribute to the derailment.
2. No evidence of pre-derailment equipment defects was found.
3. The switch stand spindle fractured at the bolt hole where the spindle connects to the switch handle. The break permitted the switch points to move freely.
4. The train derailed when the switch points opened and the wheels on VIA 8709 travelled the diverging route.

5. The fracture area displayed fatigue cracks to approximately 85 per cent of the fracture surface which had progressed over a considerable period of time.
6. There are no inspection procedures established for inspecting the integrity of switch stand spindles.

Cause and Contributing Factors

The switch broke at the bolt hole at the connection between the switch handle and the spindle, allowing the switch points to move freely which resulted in VIA 8709 travelling the diverging route and derailling. The bolt hole displayed multiple fracture origins consistent with torsional loading, and the crack had grown over a considerable period of time.

Safety Action

On 25 May 1995, CN issued instructions to all district engineers to dismantle and inspect switch stands as part of their annual turnout inspections.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, Chairperson, John W. Stants and member Zita Brunet, authorized the release of this report on 27 October 1995, pending ratification by the full Board.