

RAILWAY OCCURRENCE REPORT

DERAILMENT

**CN NORTH AMERICA
FREIGHT TRAIN NO. A-411-21-20
MILE 16.5, CRAN SUBDIVISION
LA DORÉ, QUEBEC
21 JUNE 1995**

REPORT NUMBER R95D0093

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

At approximately 0030 eastern daylight time (EDT) on 21 June 1995, CN North America's (CN) northward freight train No. A-411-21-20 (train 411) derailed four locomotives and eight cars near La Doré, Québec, Mile 16.5 of the Cran Subdivision. Approximately 31,800 litres of diesel fuel was spilled from the derailed locomotives, most of which was recovered. There were no injuries.

Ce rapport est également disponible en français.

Other Factual Information

As train 411 was travelling at 36 mph in the vicinity of Mile 16.5 through a one-degree curve, the locomotive engineer noticed high water in the east ditch and that the ballast and subgrade had washed out approximately 200 feet ahead of the train. The locomotive engineer immediately applied the train brakes in emergency, but the lead locomotive passed over the washout and derailed before the train slowed. The train continued for approximately 600 feet before coming to a stop. After conducting the necessary emergency procedures, the crew determined that all four locomotives and eight cars (the 1st car to the 8th car from the head end) had derailed. Three cars were destroyed, and four locomotives and five cars were extensively damaged. Approximately 700 feet of main track was destroyed.

The train, powered by 4 locomotives, was hauling 3 loaded cars and 57 empty cars. It was approximately 3,800 feet in length and weighed about 2,300 tons.

In the area of the derailment, the subdivision is single main track. The authorized timetable speed is 30 mph for all trains. The traffic in this area is controlled by the Occupancy Control System authorized by the Canadian Rail Operating Rules and supervised by a rail traffic controller in Montreal.

Through the derailment area, the track consisted of 100-pound continuous welded rail manufactured and laid in 1970. The subgrade was constructed with fine sand. The ballast was crushed stone with 12-inch shoulders. All track components were in good condition. The ballast and subgrade had eroded, creating an approximate 20-foot-long gap under the track at Mile 16.5.

The assistant roadmaster inspected the track by Hi-rail on 20 June 1995; no irregularities were noted.

A southward freight train passed through the derailment area at approximately 2000 EDT on 20 June 1995. At that time, the crew had not noticed any track abnormalities.

The water on the east side of the right-of-way ditch was flowing from a breached beaver dam at the western tip of Sarry Lake, located approximately one kilometre northeast of Mile 16.5. The surface area of the lake had been approximately 50,000 square metres. The dam was approximately 60 metres long, 2 metres wide and 2 metres deep and had given way near the middle.

The last beaver dam inspection was carried out on 31 May 1995, when an opening, eight metres long by two metres high, was made in the centre of the dam to reduce the water level. The water level was successfully lowered without damage to the track. The opening had been reconstructed by beavers before the dam was breached.

The temperature was 15 degrees Celsius. The skies were clear and the winds calm.

Analysis

The train operation conformed to company instructions and government safety standards with the exception of the 6-mph overspeed. The overspeed is not considered to have caused or contributed to the derailment although it may have increased its severity.

The train derailed at a location where an unusually high volume of water flowing in the east ditch had eroded the ballast and subgrade under the rails. The rail of the unsupported track structure deflected and collapsed under the weight of the locomotive consist, derailing the train.

The surge of water that eroded the ballast and subgrade originated in Sarry Lake, approximately one kilometre northeast of the derailment site, and was a direct result of a breached beaver dam. The breached dam produced an instant water flow, which moved downhill along a creek towards the track and then flooded the ditch on the east side of the right-of-way. The eroded condition of the track had developed after the passage of a southward train four and one-half hours before the derailment.

Since the dam burst at the repair of the opening created to eliminate the risk posed by the lake, this effort proved to be counter-productive. It must, therefore, be recognized that such activity (creating openings in dams) may only provide temporary risk reduction and that other methods may be more effective in the long term.

Findings

1. The train was operated in accordance with company instructions and government safety standards except that the recorded speed exceeded the maximum permissible track speed by 6 mph just before the derailment.
2. The overspeed is not viewed as a causative factor but may have resulted in more cars being derailed and greater damage than if the train had been operated within the maximum permissible track speed.
3. The derailment occurred as the train passed over a 20-foot washed-out area along the track at Mile 16.5.
4. The washout was a result of water eroding the ballast and subgrade by a surge of water moving in the east ditch.

5. The surge of water in the ditch was a result of a breached beaver dam at the western tip of Sarry Lake, situated approximately one kilometre northeast of the derailment site.
6. The beaver abatement program only temporarily neutralized a dangerous source of water and inadvertently resulted in a dangerous condition.

Cause

The derailment was caused by a washout of subgrade and ballast resulting from a sudden surge of water from a breached beaver dam, located approximately one kilometre northeast of the track.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson, John W. Stants, and members Zita Brunet and Maurice Harquail, authorized the release of this report on 24 April 1996.