RAILWAY OCCURRENCE REPORT

COLLISION

CANADIAN PACIFIC RAILWAY
TRAIN NO. 401-17 AND TRAIN NO. 996-19
MILE 25.9, THOMPSON SUBDIVISION
SAVONA, BRITISH COLUMBIA
20 AUGUST 1995

REPORT NUMBER R95V0174

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Summary

At approximately 0420 Pacific daylight time (PDT), Canadian Pacific Railway (CPR) train No. 401-17 (train 401) collided with CPR train No. 996-19 (train 996) at Mile 25.9 of the Thompson Subdivision in Savona, British Columbia. As a result of the collision, 3 locomotives and 10 cars derailed from train 401 and 14 cars, from train 996. The conductor and locomotive engineer on train 401 were injured. The derailed cars did not contain dangerous goods.

Ce rapport est également disponible en français.

Other Factual Information

Westward train 401 departed Kamloops, British Columbia, at approximately 0307 and travelled westward between Kamloops and Savona without incident. The train was powered by 3 locomotives and was handling 41 loaded cars. It was about 5,800 feet in length and weighed approximately 4,800 tons. The train crew, consisting of a locomotive engineer, conductor and head-end trainman, was ordered for 20 August 1995 at 0220 at Kamloops to operate train 401 to North Bend, British Columbia.

At Savona, westward train 401 encountered eastward train No. 992-19 (train 992) stopped in the siding at the east end at Signal 246D (Mile 24.6). Two crew members from this train were positioned on the ground on either side of the main track and inspected train 401 as it passed by. Further west, train 401 encountered eastward train 996 closing up behind train 992 in the siding. Train 401 then received a positive report of the passing inspection from the crew of train 992 and continued west, rounding several curves approaching the west end of the siding. The crew members of train 401 observed Signal 259 (Mile 25.9) governing train movements at the west siding switch displaying a stop indication. They also observed the remainder of train 996 entering the siding just beyond the signal. The locomotive engineer placed the train brakes in emergency and slowed from 38 mph to 24 mph before his train collided with the rear portion of train 996. The collision resulted in the derailment of 3 locomotives and 10 cars on train 401 and 14 cars on train 996. The derailed locomotives struck a support abutment for the Trans-Canada Highway overpass and rolled over onto their sides. The locomotive engineer and conductor of train 401 sustained serious injuries. The trainman, who was located in the second locomotive, suffered minor injuries.

The method of train control on the Thompson Subdivision is Centralized Traffic Control (CTC), authorized by the Canadian Rail Operating Rules (CROR) and supervised by the rail traffic controller (RTC) located in Vancouver, British Columbia. Train movements are governed and authorized by signal indications. There is currently no form of automatic intervention, associated with this method of train control, capable of stopping a train or enforcing speed requirements. There is no form of passive warning system to indicate a train's proximity to areas of restriction associated with this method of train control. CTC has been in use in its present form in Canada for approximately 45 years and was installed on the Thompson Subdivision in 1967.

The signal governing westward movements approaching the east siding switch at Savona, Signal 221, was displaying a Clear Signal, indicating proceed. As train 401 approached the signal at Savona, Signal 245, located just east of the east siding switch, the conductor was completing a pay ticket from a previous trip and the locomotive engineer was reclined in his seat completing a crossword puzzle. The train was travelling at approximately 28 mph. The interior cab light was on above the locomotive engineer to illuminate the crossword puzzle. The locomotive engineer looked up and observed the first train in the siding and the two crew members on the ground. He does not recall observing the signal indication at Signal 245. The throttle was in the No. 8 position. The conductor recalls seeing something green in the direction of Signal 245 but does not recall where on the signal the green was located. He also recalls seeing train 992 and the crew members on the

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[1] All times are Pacific daylight time (Coordinated Universal Time (UTC) minus seven hours) unless otherwise stated.

ground for the inspection. He then looked back down at the ticket he was completing. Some time later, he looked back up in an attempt to confirm his first observation regarding the signal; however, his train had passed Signal 245 and was going over the east siding switch. The trainman recalls seeing a Clear Signal at Signal 245.

Signal 245 is a high-mast, three-aspect signal. A Clear Signal indication is displayed when the top aspect is green and the two aspects underneath it are red. Testing performed on the signal system after the occurrence indicated that the system was functioning as intended. The system is designed to default to a more restrictive signal indication than operating conditions require, in the event of a malfunction. If a signal is observed improperly displayed, crews are to obey the signal as if it were displaying the most restrictive indication that can be displayed by that signal (CROR Rule 27). In the case of Signal 245, the most restrictive signal indication possible is a Stop Signal (CROR Rule 429 - three aspects displaying red).

The presence of train 996 entering the siding at the west end of Savona would not have permitted the signal system to display a more favourable signal than Clear to Stop (CROR Rule 410) on Signal 245 as train 401 approached the east end of Savona. The indication of a Clear to Stop Signal is "Proceed, preparing to stop at next signal." A Clear to Stop indication is displayed on this signal with the top aspect yellow and the two aspects underneath red.

The locomotive engineer had been qualified for his position for approximately 18 years and had been operating on the Thompson Subdivision for approximately nine years. The conductor had been qualified for his position for approximately 17 years and had been working on the Thompson Subdivision for approximately 18 years. Both crew members met established rest and fitness requirements before reporting for duty.

At the time of the collision, the skies were clear and there were calm winds with good night visibility. The temperature was eight degrees Celsius.

Analysis

There is no evidence to suggest that the signal system malfunctioned. Therefore, it is reasonable to conclude that Signal 245 was displaying a "Clear to Stop" signal indication for train 401.

As train 401 approached Signal 245 at the east end of Savona, the locomotive engineer and conductor were engaged in activities unrelated to the operation of their train. As a result, neither observed the signal indication at Signal 245. The trainman, who was posted in a trailing locomotive, remains adamant that he observed a Clear Signal even though there is no evidence to suggest that the signal system was malfunctioning. Consequently, train 401 was operated at 38 mph approaching the west end of the siding and could not be stopped before striking train 996 at approximately 24 mph.

All crew members share the responsibility for the safe operation of the train, yet no crew member questioned what the other was doing. Further, no single crew member chose to heighten his own vigilance in the absence of the other's full concentration.

Each crew member relies on other crew members on a constant basis. It is possible that, on this occasion, each crew member made the assumption that the other crew members were vigilant, therefore making it safe to devote their attention to something else for a few moments.

CTC has been the method of train control in use on the Thompson Subdivision for 29 years. The system does not allow for intervention to stop a train or control train speed in the event that it becomes necessary to do so. A train control system capable of intervention to stop a train or a passive warning may have prevented this collision.

Findings

1. Train 996 was being operated in accordance with government safety standards and company procedures.

2. The crew members of train 401 did not observe the indication of Signal 245 and continued to operate their train at a speed that did not permit stopping before striking the side of train 996.

3. The signal system was functioning as intended.

4. There is no means of intervention capable of stopping or slowing a train currently associated with CTC and no passive warning system associated with CTC that would alert a crew of their proximity to points of restriction.

Causes and Contributing Factors

The collision occurred when the crew members of westward train 401 did not observe the indication of Signal 245 and continued to operate their train at a speed that did not permit stopping before the eastward train.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson, Benoît Bouchard, and members Maurice Harquail and W.A. Tadros, authorized the release of this report on 09 October 1996.