



**SIGNAL & TRAIN CONTROL GROUP -
FACTUAL**

**Raking collision between Canadian Pacific train and Union Pacific
train impacting BNSF train derailment in
St. Paul, Minnesota on
August 25, 2021**

RRD 21 LR 014

(4 Pages)

**NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF RAILROAD, PIPELINE & HAZ-MAT INVESTIGATIONS
WASHINGTON, D.C. 20594**

**SIGNAL & TRAIN CONTROL GROUP-
FACTUAL REPORT OF INVESTIGATION**

A. ACCIDENT

Type: Raking Collision
Date and Time: August 25, 2021 at 5:08 p.m. CST
Location: St. Paul, Minnesota
Carrier: Canadian Pacific, Union Pacific, and BNSF
Train: Eastbound CP 296-23 (Locomotive CP 8737) and Westbound UP MSSDM25 (Locomotive UP 8264)
Fatalities: 0
Injuries: 0

B. SIGNAL & TRAIN CONTROL - INVESTIGATIVE GROUP

G. Scott
Rail Accident Investigator
NTSB - RPH

J. Fritz
AVP Signal & Communication BNSF
Railroad

J. Boots
Rail Safety Specialist – PTC Federal
Railroad Administration

K. Mullins
Director of Research Brotherhood of
Railroad Signalman

B. ACCIDENT SUMMARY

For summary of the accident, refer to the *Accident Summary Report* in the docket for this investigation

C. DETAILS OF THE INVESTIGATION

1. BNSF St. Paul Subdivision

1.1 Description of Signal System

The St. Paul Subdivision¹ extends from MP 410.58 St. Croix to MP 11.4 University in a timetable east-west direction. The subdivision consists of double main track. Maximum authorized timetable speed is 50 mph for freight trains and 70 mph for passenger trains. The maximum speed for freight trains in the accident location is 25 mph.

In the vicinity of the accident area, the BNSF authorizes train movements with a Centralized Traffic Control (CTC). Train movements are coordinated by the DS84 train dispatcher located at Dispatch Center in Fort Worth, TX. Train movements on the St. Paul

¹ Twin Cities Division Timetable No. 7, effective October 5th, 2016

Subdivision are governed by operating rules, special instruction, timetable instructions, and the signal indications of the traffic control system.

The signal system uses ElectroLogix track circuits for train occupancy detection. Wayside signals are colorlight signals with upper and lower signal heads capable of displaying green, yellow, and red aspects for train movements in either direction.

2. Signal System Data Logs

Field signal and train control data logs for control point 7th Street (MP 430.1 St. Paul Sub & MP 0.32 Midway Sub) and control point Division Street (MP 429.7 St. Paul Sub) were downloaded and listed in Table 2.

Table 1 - BNSF Field Signal Data Logs

Time	Signal Location	Event
16:53:59	Division Street	East approach track circuit is occupied by westbound UP 8264 with diverging approach on 2W signal
16:57:55	Division Street	2W signal goes to stop as westbound UP 8264 enters OS track circuit
17:00:14	7 th Street	3EB Signal displayed a diverging approach
17:06:30	7 th Street	3EB Signal goes to stop as east bound CP 8737 enters OS track circuit
17:08:08	Division Street	West approach track circuit is occupied by CP 8737
17:11:00 approx.		Collision reported to dispatch

3. Post-accident Signal System Examination and Testing

The post-accident investigation found all wayside signal equipment and appurtenances between control point 7th Street and control point Division Street locked and secured with no indications of tampering or vandalism.

The signal system did not receive any damage as a result of this incident. Signal malfunction reports for the previous six months were requested and reviewed.

4. Signal System Maintenance, Inspection and Test Records

Railroad signal maintenance, inspection and test records were reviewed for monthly, quarterly, locking, and relay tests for wayside signal locations for CP 7th Street and CP Division Street and were in accordance with federal requirements.

5. PTC Related Events

PTC was not active in CP striking train 296-23 (Locomotive CP 8737) at the time of the event. The timeline for this trains PTC cut out sequence is listed in Table 3.

Table 3 – CP Train 296-23 Locomotive 8737 PTC event sequence (Central Standard Time on August 25, 2021)

Time	PTC Cut Out Event
05:15	Train 296-23 with locomotive CP 8737 initialized the PTC system at MP 292.1 Carrington Subdivision.
08:58	Locomotive Interface Gateway (LIG): Lost Communication with PTC system transitioning PTC from Active to Failed state.
08:59	Crew called into PTC Help Desk, and crew was instructed to run Non-PTC.
09:00	Train was located at Mile 185 Elbow Lake Sub.
09:17	Ticket opened for Locomotive Interface Gateway (LIG) data invalid error.
	Train proceeded East to Glenwood, MN MP 120.3, where a new crew boarded the train.
11:53	New crew called PTC helpdesk to validate PTC defective locomotive and was informed the defect was still present and crew was authorized to operate non-PTC.
	Train travelled toward St. Paul which is the nearest designated PTC repair facility.
17:08	Prior to arrival at St. Paul Yard, the train was involved in a collision near the St. Paul yard.

Canadian Pacific Railroad records from the PTC Help Desk of all PTC issues for the past 30 days were requested and have been reviewed with no issues found.

**SIGNAL & TRAIN CONTROL GROUP
END OF FACTUAL REPORT**
