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

**Crossing collision between CSX freight train and SEPTA trolley with injuries in
Darby, Pennsylvania on
December 9, 2021**

RRD22LR004

(5 Pages)



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|---------------------------------------|---------------------------------|---|--------------------------------------|----------------------------------|------------------|
| DATE OF ACCIDENT 12/09/2021 | TIME (2400) 08:25 EDT | INVESTIGATOR-IN-CHARGE G. Scott | GROUP CHAIRPERSON G. Scott | CASE NUMBER RRD22LR004 | PAGE 2 |
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**NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF RAILROAD, PIPELINE & HAZ-MAT INVESTIGATIONS
WASHINGTON, D.C. 20594**

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

A. ACCIDENT

Type: Crossing Collision
Date and Time: December 9, 2021 at 8:25 a.m. EST
Location: Darby, Pennsylvania
Carrier: CSX Transportation and SEPTA
Train: Eastbound SEPTA 8104 (Trolley 9070) and Westbound CSX I03309 (Locomotive CSX 3008)
Fatalities: 0
Injuries: 8

B. SIGNAL & TRAIN CONTROL - INVESTIGATIVE GROUP

G Scott
Rail Accident Investigator
NTSB - RPH

B Johnson
Director Signal & Communication
CSX Railroad

R Dolbin
Transportation Specialist
Pennsylvania State Oversight

J Hurley
Inspector
Federal Railroad Administration

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. CSX Philadelphia Subdivision

1.1 Subdivision Characteristics

The Philadelphia Subdivision¹ extends from MP QA 4.3 to MP BAK 89.6 in a timetable east-west direction. The subdivision consists of single main and double main

¹ Philadelphia Timetable No. 2, effective November 1st, 2019



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tracks. Maximum authorized timetable speed is 50 mph for freight trains. The maximum speed for freight trains in the accident location is 30 mph.

1.2 Description of Signal and Crossing System

In the vicinity of the accident area, the CSX authorizes train movements with a Centralized Traffic Control (CTC). Train movements are coordinated by the BE train dispatcher located at Dispatch Center in Jacksonville, FL. Train movements on the Philadelphia Subdivision are governed by operating rules, special instruction, timetable instructions, and the signal indications of the traffic control system.

The signal system uses Electro Code track circuits for train occupancy detection at incident location. Wayside signals are colorlight signals for train movements in either direction.



Photo shows the multiple Electro Code units used to detect track occupancy for the signal system

The crossing investigated uses a unidirectional Safetran 3000 units along with two D.C. track relays to detect train occupancy for approaching trains. T1 of the Safetran unit looks west and T2 of the Safetran unit looks east. There are two D.C. relays that monitor the island circuit which happens to be a railroad diamond (crossing at grade) where the CSX freight line crosses the SEPTA trolley line.



Photo to the left shows Safetran 3000 unit. Photo to the right shows the 2 D.C. track relays



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1.3 CSX Signal System Data Logs

Field crossing data logs for control Main Street Road crossing (MP BAK 4.97 Philadelphia Sub) were reviewed on site. On site review of data logs showed a 27 second warning time of crossing during time of incident. Download of crossing data logs were unsuccessful.

1.4 Post-accident Crossing System Examination and Testing

The post-accident investigation found all crossing equipment and appurtenances at Main Street Road crossing were secured with no indications of tampering or vandalism.

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

The Main Street Road crossing was tested following the accident, by CSX with the FRA present and observing, with no exceptions taken and were in accordance with federal requirements.

1.5 CSX Crossing System Maintenance, Inspection and Test Records

Railroad crossing maintenance, inspection and test records for the past 12 months were reviewed for monthly, quarterly, and annual tests for Main Street Road crossing were in accordance with federal requirements.

1.6 CSX Incident Reports

CSX Incident logs for Main Street Road crossing (MP BAK 4.97 Philadelphia Sub) were reviewed. Review of data logs showed 17 incidents over the past 12 months. Of the 17 incidents 6 were CSX equipment working or traveling within the approach of the crossing, 6 were crossing gate arms being knocked off, and 5 were clear on arrival with no issue identified. None of the 17 issues pertained to SEPTA trolley traffic.

2. SEPTA Route 11

2.1 Route Characteristics

The SEPTA subway–surface trolley lines are a collection of five SEPTA trolley lines that operate on street-level tracks in West Philadelphia and Delaware County, Pennsylvania, and underneath Market Street in Philadelphia's Center City. The lines, Routes 10, 11, 13, 34, and 36, collectively operate on 39.6 miles (63.7 km) of route. Starting from its eastern end at 13th Street, Route 11 operates tunnel service until it surfaces at the 40th Street Portal where it then becomes a street running operation. It continues with street running operations until it ends at the Darby Transportation Center. The at-grade crossing along Main Street at the intersection of Sixth Street in Darby where it crosses a CSX Transportation railroad line at grade. This is one of a very few grade crossings between a light rail line and a major freight rail line in the United States and is know as the Darby Diamond.



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2.2 Description of Signal System

The SEPTA surface portion of the trolley line operates in a street running fashion at the accident location and is not governed by a signal system

SIGNAL & TRAIN CONTROL GROUP
END OF FACTUAL REPORT
