NATIONAL TRANSPORTATION SAFETY BOARD OFFICE OF RAILROAD, PIPELINE & HAZARDOUS MATERIALS INVESTIGATIONS WASHINGTON, D.C. 20594

RAILROAD SIGNAL & TRAIN CONTROL GROUP FACTUAL REPORT OF INVESTIGATION

Highway-Rail Collision
Amtrak P09806 Silver Meteor
25TH St. West Palm Beach Fl.

July 6, 2016

DCA16FR009

Contents

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A. ACCIDENT

Type: Highway Grade Crossing Highway-Rail Collision
Date and Time: July 6, 2016 9:59: am
Location: West Palm Beach Fl. 25th St. MP SX968.32 DOT# 628116P
Carrier: South Florida Regional Transportation Authority
Train: Northbound Amtrak #P09806 / Silver Meteor
Fatalities: 0
Injuries: 1 injury

B. SIGNAL & TRAIN CONTROL - INVESTIGATIVE GROUP

Niles Blaize
General Manager of Maintenance of Way
VTMI

Kalu Kelly Emeaba
Investigator/ Electrical Engineer
NTSB

R. Page
Railroad Accident Investigator
NTSB Office of Railroad, Pipeline, and Haz-Mat Investigations

Russell Hunter
Signal &Train Control Inspector
US Department of Transportation
Federal Railroad Administration

Michael W. Cyr
Senior RR Signal Inspector
South Florida Regional Authority
EAC Consulting, Inc.

Timothy Tarrant
Brotherhood of Railroad Signalmen

Figure-1 depicts vehicle that was struck by Amtrak 98 Silver Meteor in Northeast quadrant of 25th Street Highway Grade Crossing, West Palm Beach Florida, July 6, 2016, 9:59 am.

C. ACCIDENT SUMMARY

For a summary of the accident, refer to the Accident Summary report, within the docket.

D. DETAILS OF THE INVESTIGATION

1. Description and Method of Operation of the South Florida Regional Transportation Authority (SFRTA)

Trains on #1 and #2 track through this area have authority to move under Traffic Control System[1] from the South Florida Regional Rail Transit Authority, (SFRTA) Dispatcher located in Pompano, FL with a timetable speed of 55 mph for all trains, Passenger, Tri Rail, and Freight. Amtrak provides dispatcher services for SFRTA[2].

SFRTA, Amtrak, and CSX utilize this area.

- SFRTA operates fifty weekday revenue trains and thirty weekend revenue trains.
- Amtrak operates four revenue trains per day.
- CSX operates approximately four freight trains and runs roughly one local through this area a day.

2. 25th St. Highway Grade Crossing Warning System

25th St, DOT 628116P, M.P. SX 968.32 Highway Grade Crossing is located in West Palm Beach, FL. is on the northern end of the 72-mile South Florida Regional Transit Authority rail corridor. It is positioned between Control Point Coral milepost (SX 968.7) and Control Point Gator MP (SX 966.7). Three tracks traverse the grade crossing in a North/South direction. The tracks are designated from East to West as main track #2, #1, and Industry Track (U & Me). 25th Street is a four lane undivided road at the highway rail-grade crossing. 25th St. traffic travels in an east-west direction with a speed limit of 30 mph. 25th Street is marked with RR warning stop lines and

1 A block signal system under which train movements are authorized by block signals whose indications supersede the superiority of trains for both opposing and following movements on the same track.
2 Amtrak provides dispatching services for SFRTA out of Pompano FL. SFRTA dispatching facility.

advance warning signs. There are stop bars painted on the road along with "do not stop on track" signs. The construction of the road is standard asphalt. The Highway Grade Crossing Warning System is equipped with four quadrant gates, lights, bells and two cantilever structures for over lane lighting. There are four quadrant gates at the location because this portion of track is an approved quite zone. All flashing light units at this highway rail-grade crossing are twelve-inch lights equipped with Light Emitting Diodes (LEDS). Exit gates are located at the southeast and northwest quadrants. The signal bungalow is located at the southeast quadrant. It is an 8X8 steel house. A Safetran Grade Crossing Predictor GCP-3000 D2 unit was utilized as the primary warning control for both main tracks and was programmed to a frequency of 156 HZ.

This unit was in the primary mode upon entering the crossing. The standby unit was fully functional. There was no internal recorder module in the unit, but an external North American Signal (NAS) recorder was on-site. Upon inspection, it was observed that the NAS external recorder was in the off position, in maintenance mode, and the CPU circuit board was missing.

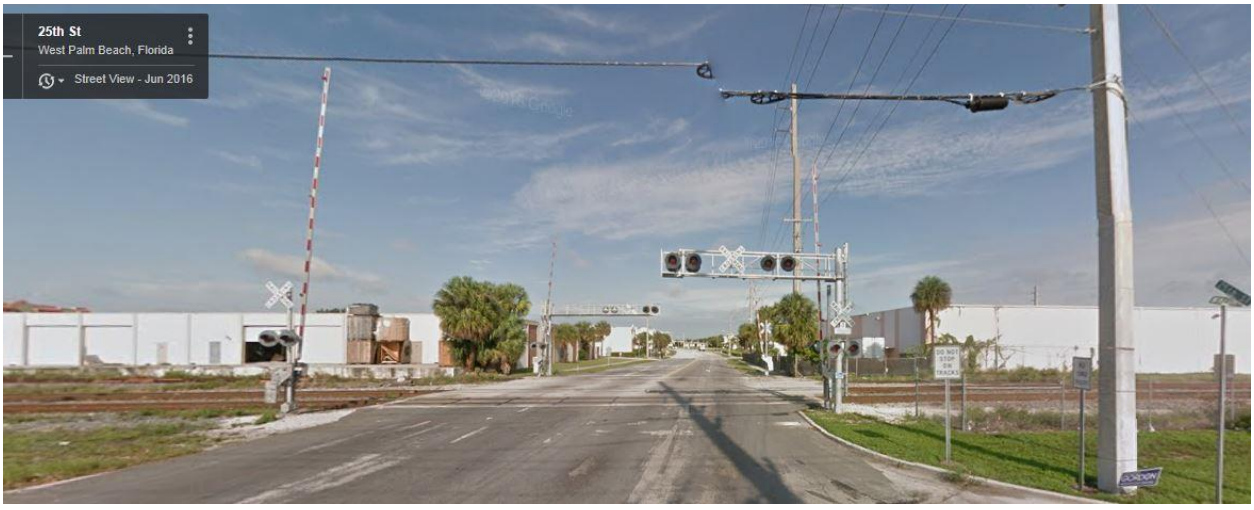

Figure-2 depicts view traveling west on 25th street, same as driver was traveling.

The approaches to the highway-rail grade crossing utilizes a Down Stream Adjacent Crossing (DAX) circuit on both ends. The northbound approach on both the number one and two tracks is approximately 2500 feet from the edge of the road to the termination. At that point a DAX circuit completes the northbound approach with another 1600 feet to the termination shunt. On the southbound approach the circuit travels approximately 3200 feet from the edge of the road to the termination and then another 2900 feet of DAX circuit. The industry track has no approach and was operated with a single ring-ten island circuit. All other functions of the Highway Grade Crossing Warning System are accomplished utilizing electro-mechanical relays in conjunction with the GCP.

3. Highway Grade Crossing Signal Event Recorder

The Highway Grade crossing bungalow located at 25th St. had a North American Signal event recorder. The recorder monitors some of the electro-mechanical relays, the grade crossing warning device operation, and island relay input voltage. This process of recorded events includes crossing activation, light activation, light flash rate, gate movement, train occupancy of the crossing and crossing warning time. However, the NAS recorder does not monitor the control relay output of the Grade Crossing Predictor (GCP). The event recorder was found in the off position and in maintenance mode at the time of the post-accident inspection. Additionally, the CPU card was missing. A second CPU card was obtained and programmed. The data on the event recorder was still in the system and was retrieved. The time on the retrieved data was off by 3 hours and 26 minutes. The inaccurate recorder time was compared and corrected using data from Amtrak P09806, dispatcher event console, and signal data downloaded from CP Coral. The data from the NAS event recorder documented the accident time as 06:33:07 07/06/2016. The corrected time was 09:59:07 07/06/2016. The NAS recorder displayed that the crossing warning time for the accident was one second.

Table 1 depicts the crossing warning time of one second at the time of the accident.

```
07/06/16 06:33:26 LOG   GATE 1 MOVEMENT TIME DOWN (sec) 015
07/06/16 06:33:26 LOG   AGDPR RELAY POSITION UP
07/06/16 06:33:20 LOG   GATE 2 MOVEMENT TIME DOWN (sec) 009
07/06/16 06:33:20 LOG   BGDPR RELAY POSITION UP
07/06/16 06:33:11 LOG   XPPR RELAY DELAY (sec) 005
07/06/16 06:33:11 LOG   XPPR RELAY POSITION DOWN
07/06/16 06:33:07 ALARM  CROSSING WARNING TIME (sec) 001
07/06/16 06:33:07 LOG   ISL2 RELAY POSITION DOWN
07/06/16 06:33:06 LOG   XR1 RELAY POSITION DOWN
07/06/16 06:33:06 LOG   GPPR RELAY POSITION DOWN
07/06/16 06:32:38 LOG   ALL GATES MOVEMENT TIME UP (sec) 010
07/06/16 06:32:38 LOG   GPPR RELAY POSITION UP
07/06/16 06:32:32 LOG   BGDPR RELAY POSITION DOWN
07/06/16 06:32:29 LOG   XPPR RELAY POSITION UP
07/06/16 06:32:28 LOG   XR1 RELAY POSITION UP
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4. Post-Accident Signal System Examination and Testing.

4.1 Highway Grade Crossing Warning System

Upon arrival, a stop and flag protection order was placed on both main lines and the crossing signal bungalow was sealed. Post-Inspection began with obtaining the information contained within the GCP-3000 display panel. The warning time of the last ten trains that included the accident train were recorded and photographed. The warning time of the GCP that was recorded in the display module for the accident train was 39 seconds {F-3 pg-9}. The NAS recorder indicated actual warning time of the control relay to be only one second {table 1 pg-8}. Post-accident testing continued with shunt tests on both main tracks and recording the results of each test. The termination shunts were removed to ensure proper operation and approach distance. Battery and ground tests were performed on the highway rail-grade crossing. Trains were observed in both directions on both tracks at track speed to verify warning times. All applicable tests were

performed referenced by Code of Federal Regulation Title 49 Part 234 Subpart D Maintenance, Inspection, and Testing. There were no exceptions noted during the Post-Accident Inspection of the Grade Crossing Warning Device or signal appurtenances associated with the Highway Grade Crossing Warning System. Additionally, the NAS event recorder was tested at the manufacturer's test facility in Gainesville FL. on August 23, 2016 by NTSB, FRA and National American Signal technicians with no exception taken.

Figure-3 depicts warning time of the Grade Crossing Predictor to be 39 seconds

4.2 Wayside Signals

Inspection was performed of the absolute and intermediate signals in the accident area. Those locations equipped with data loggers were downloaded. Signal aspects were verified and ground tests were performed. Post-Accident signal lamp voltage measurements were recorded. There were no defects noted during the examination of the signal system or the associated signal appurtenances. This area does not have Positive Train Control (PTC) installed. However, it is scheduled to be implemented by December 2018.

4.3 Post-Accident Train Simulation

On July 9, 2016, an Amtrak train was dispatched to simulate the accident and to measure sight distances warning time. Two simulations were performed. The first simulation measured sight distance from the locomotive to the crossing, warning system detection, and island relay detection. The second simulation was performed at accident speed to obtain warning time, gate descent, light verification, and bell activation. No exceptions were taken with either simulation train.

5. SFRTA Highway Grade Crossing Warning System Trouble/Remedy Tickets

Highway Grade Crossing Warning System trouble/remedy tickets logged by the SFRTA PSCC (Public Safety Coordination Center) for the 25th St Highway Grade crossing Warning System were requested and were reviewed for the 12-month period preceding the accident. There were no exceptions taken with the trouble/remedy tickets.

6. SFRTA Railroad Maintenance Records

Railroad maintenance, inspections and tests records were provided for monthly, quarterly, annual, 4-year, and 10-year inspections. No exceptions were taken with the reports.

7. Damages

There were $16,305.00 damages to the Amtrak locomotive. No other damage was done to the SFRTA signal system or track because of this Highway-Rail collision.

8. Dispatcher Audio Files

SFRTA dispatcher audio files in connection with this accident were obtained from the Pompano FL. SFRTA office. The audio file at 09:23:10 am 07/06/2016 reflects that Signal Inspector Alberto Perez called the dispatcher and informed him that he would be performing relay tests at 25th St. Highway Grade Crossing. At 09:59:10 a.m., 07/06/2016 Amtrak train P09806 engineer reported to the dispatcher that they had struck an automobile. Additionally, the engineer of Amtrak P09806 reported that the crossing gates at 25th St. did not activate.

9. Interviews

An eyewitness, Amtrak Crew members, VTMI managers and employees gave interviews. All interviews have been entered into the docket and once released may be viewed. An eyewitness stated, "When I noticed that the guard, the man working on the train guards was standing in the booth there at the doorway, and he was waving cars on". A subpoena to testify was issued to the Signal Inspector involved in the accident. On Wednesday August 10, 2016. The Signal Inspector declined to comment on the accident. He stated, "On the advice of counsel, I refuse to answer any question and exercise my rights under the 5th Amendment, to the United States Constitution."

END OF FACTUAL REPORT

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Party to the Investigation - Acknowledgment Signatures

The undersigned designated *Party to the Investigation* representatives attest that the information contained in this report is a factually accurate representation of the information collected during the investigation, to the extent of their best knowledge and contribution in this investigation.

_____ Date 12-27-2016

Niles Blaize, VTMI/s/

_____ Date 12-27-2016

Tim Tarrant, Brotherhood of Railroad Signalmen /s/

_____ Date 12-27-2016

Russell Hunter, Federal Railroad Administration /s/

_____ Date 12-27-2016

Ricky Page, NTSB/s/

_____ Date 12-27-2016

Kalu Kelly Emeaba, NTSB /s/

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_____ Date 12-27-2016

Michael W. Cyr, EAC Consulting, Inc.

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