[redacted]

NATIONAL TRANSPORTATION SAFETY BOARD

Office of Railroad, Pipeline and Hazardous Materials Investigations

WASHINGTON, D. C. 20594

CSX Transportation
Highway-Railroad Grade Crossing Collision with Motor Coach
Biloxi, Mississippi

March 7, 2017

NTSB Accident Number: HWY17MH010

Operations Group Factual Report

Tomas Torres, Group Chairman

1 Operations Group Members

Tomas Torres NTSB-Operations Group Chairman [redacted]	Gregory Drakulic FRA Safety Specialist Chief [redacted]
Jeremy Moats FRA Track Safety Inspector [redacted]	D.Merrell Porter, Jr. Rails Safety Inspector, Operating Practices [redacted]
Brad Spencer CSX Director of Train Accident Prevention [redacted]	Bob Windland Biloxi Police Department ,Crash Investigator Traffic Division [redacted]

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ACCIDENT SUMMARY

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

Events Prior to the Accident

The crew of the CSX Transportation (CSX) train included a locomotive engineer, and a conductor. The crew went on duty at 7:30 a.m. central standard time on March 7, 2017, at their away from home terminal at the CSX Gentilly Yard in New Orleans, Louisiana.[1]

The train consisted of three locomotives, 27 cars loaded with mixed freight, and 25 empty cars. The train length was 3164 feet long and weighed 3990 tons. The train was equipped with a two- way telemetry and end of train device.[2]

The train received an initial terminal train air brake test at the New Orleans terminal in New Orleans, Louisiana and departed at 7:50 am. Both the engineer and conductor had their statutory time off prior to going on duty at 7:30 am.[3]

[1] All times in this report are central standard time.

[2] Telemetry - The combination of a head-of-train device (HTD) on the controlling locomotive and an end-of-train device (EOT) mounted on the rear car of the train that has the ability to communicate train-related information to and from the controlling locomotive.

[3] Refer to 49 *Code of Federal Regulations* (CFR) Part 228 for additional information on Hours of Service requirements.

As the Northbound train approached the accident area, the locomotive engineer was seated at the controls of the leading locomotive. The conductor was seated on the conductor station of the leading locomotive.

In the area of the accident, there were several public highway-railroad grade crossings on tangent track with level grade in succession.[4] There was no vegetation or building structures obstructing the view of the train crew or the motor vehicle operator.

The CSX New Orleans &Mississippi Subdivision (NO&M) was on the Atlanta division and operated in a timetable north/south direction (east/west geographically direction). The CSX track structure through Biloxi, Mississippi consisted of single main track. The control point (CP) South End Ocean Springs was located on the north side of the Main Street highway-railroad grade crossing and CP North End Beauvoir was located on the south side of the crossing.[5]

The Accident

CSX Train Q606-07 North

The train speed at the time of the accident was 26 mph approaching the accident area with the trip optimizer engaged.[6]

[4] *Public highway-railroad grade crossing* is where a public highway, road, street, or pedestrian walkway crosses railroad tracks and is maintained on both sides by a public authority.

[5] A *Control Point* (CP) is a station designated in the timetable where signals are remotely controlled from the control or dispatch center.

[6] *Trip optimizer* is an intelligent, fuel-saving cruise control for a locomotive that optimizes fuel consumption based on a specific train's make up and the route traveled. The locomotive engineer must take charge of the train when encountering a signal with a less favorable indication than proceed, operate the train manually, and comply with signal indication requirements.

The locomotive engineer said during an interview:

> Come around clear signals through Beauvoir. Clear signal on a distant signal 727, which was approaching the accident. And as an engineer you always -- your vision, you're always looking ahead but you're focused on 1, 2, 3 crossings directly in front of you. I can't say that I seen the bus actually pull on the crossing. I know as we come around watching, and then it become obvious that we seen a bus up there.

The engineer stated that he saw the motor coach in the distance but did not know that it was stuck on the crossing. He said that he was focusing on the crossings immediately in front of the train and any pedestrians or vehicles traveling on the adjacent roads. As the train neared the motor coach at milepost (MP) 726.6, the engineer asked the conductor if the coach, "was held up by traffic and whether the motor coach was going to move". The engineer said that the closer the train got to the Main Street crossing, he still expected the motor coach to clear the crossing. When the motor coach did not clear the crossing, the engineer told the conductor, "I'm going to "shoot" the brakes."[7] The train had slowed to 19 mph when the collision occurred. The locomotive event recorder of the lead locomotive, CSX 230, recorded the train speed before the emergency brake application and the speed at the time of the collision. (For more information, refer to the *Recorder Factor Report* in the docket.) The event recorder revealed that engineer was sounding the bell and whistle as it approached the accident crossing.

The engineer called "emergency" three times and stated "606 has hit a bus and it's bad, send help". The engineer then "toned" the train dispatcher on radio channel 94. The dispatcher responded immediately and the engineer told him about the accident. The conductor retrieved his personal cell phone from his case, turned it on, and called the CSX trainmaster. According to the

[7] *Shoot the brakes* is referring to making an emergency brake application.

conductor and engineer, the Biloxi Police Department arrived at the scene within minutes. Following notifications, the conductor got down on the ground to see how he could help or if the police needed anything from the train crew. The engineer stayed at the controls of the locomotive until he was relieved. Shortly after the police and emergency responders arrived, the conductor returned to the locomotive cab and stayed there until he was relieved. Once relieved, the train crewmembers were driven to CSX Yard in Mobile, Alabama where they went off duty.

Locomotive Safety Devices

The lead locomotive was equipped with a headlight, auxiliary lights, and the horn warning device required by Federal regulations. The lead locomotive was also equipped with a bell and positive train control, outboard facing digital video recorder, locomotive event recorder, and an alerter.[8]

The Federal Railroad Administration (FRA) motive power and equipment inspector tested these devices at the accident site. The FRA inspector also tested and inspected the train brakes and found them functioning as intended. The locomotive safety devices were in full compliance with Federal requirements.

Method of Railroad Operation

[8] 49 CFR Part 229 defines an *alerter* as a device or system installed in the locomotive cab to promote continuous, active locomotive engineer attentiveness by monitoring select locomotive engineer-induced control activities. If fluctuation of a monitored locomotive engineer-induced control activity is not detected within a predetermined time, a sequence of audible and visual alarms is activated so as to progressively prompt a response by the locomotive engineer. Failure by the locomotive engineer to institute a change of state in a monitored control, or acknowledge the alerter alarm activity through a manual reset provision, results in a penalty brake application that brings the locomotive or train to a stop.

The method of train operation was by signal indication of a traffic control system (TCS). The New Orleans and Mississippi is a timetable north-south direction (geographic east-west direction). [9]

The maximum authorized train speed on the CSX NO&M Subdivision was 60 mph for freight trains with permanent speed restrictions between posted timetable mileposts. The maximum authorized speed over the highway-railroad grade crossing at Main Street in Biloxi was 45 mph for both passenger and freight trains.

Train movements on the N&OM Subdivision were governed by operating rules, timetable instructions, and the signal indications of the traffic control system.

Following the accident, the NTSB, the CSX signal maintainer, and the FRA signal and train control inspector active warning devices were tested and found to function as intended. (For additional information, see the *Signal and Train Control Factual Report* in the docket.)

Track Structure

This portion of the CSX Railroad, the NO&M subdivision, consisted of single main track between MP 325.5 and MP 550.5 with nine passing sidings.[10] The track was maintained to Class 4 standers under 49 CFR 213.9 with a maximum speed of 60 mph for freight trains. Track that is maintained at Class 4 standards is required to be inspected twice weekly with at least a one-day interval regardless of passenger operations on that track. The segment of track proceeding the

[9] *Positive train control* (PTC) is defined in Title 49 United States Code (USC) section 20157(i)(3) as follows:[A] system designed to prevent train-to-train collisions, over-speed derailments, incursions into established work zone limits, and the movement of a train through a switch left in the wrong position.

[10] *Main Track* is a controlled track designated in special instructions as a main track. Main tracks extend through yards and between stations.

accident location was tangent for one mile before the crossing and 1,584 feet after the crossing. There is a 0.26 percent descending grade, and the curve after the accident location is 0.30 degree to the left. Main Street was tangent for 1,102 feet from Howard Avenue to the crossing at MP 726.6 and for a considerable distance after the crossing. Traveling geographic south to north on the highway is almost level until you reach the crossing where the south approach raises from 14-1/2 inches to zero within 30 feet and the north approach drops from zero to 44 3/8 inches within 30 feet.

Investigators reviewed the CSX Atlanta Division NO&M Subdivision track inspection records for MP 726.6 to determine compliance with FRA regulations. The track inspection records reviewed were between the periods between December 1, 2016 and March 7, 2017 and covered the segment of track where crossing number 340185W MP 726.6 is located. The required weekly inspections were completed and no exceptions to the FRA standards were reported.

According to the NO&M Subdivision track inspection records the segment of track at MP 726.6 was last inspected on March 7, 2017 with no defects being identified and on March 2, 2017 with no defects being identified. The last defect reported in proximity to MP 726.6 was at MP 723.10 on February 14, 2017, for loose, worn, or missing frog bolts.

Prior to this incident the last FRA track inspection was on October 10, 2016, and no exceptions were noted for this segment of track.

The NO&M subdivision's average daily train count is 12 trains. During the date range February 1, 2017 to March 6, 2017, the CSX averaged 12 trains per days through the Main Street crossing.

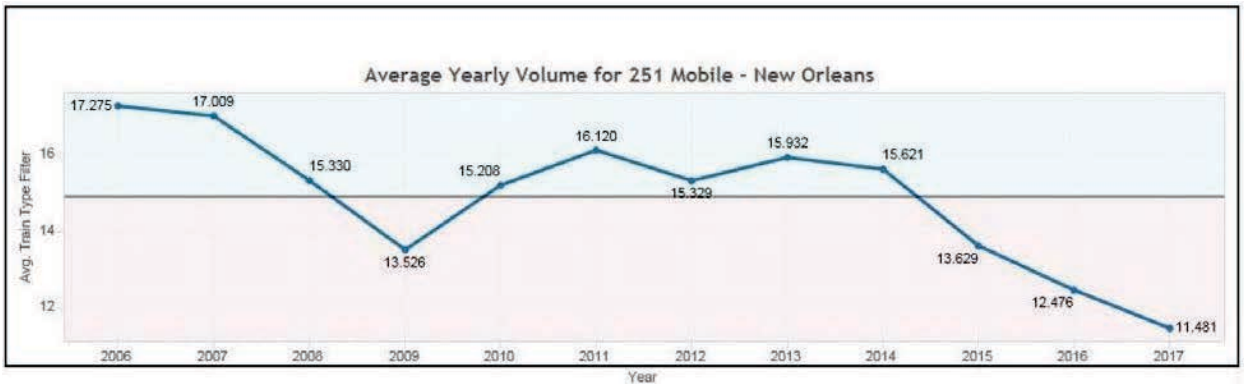

Figure 1. Graph provided by CSX. Average number of trains per day on the CSX NO&M Subdivision.

Method of Operations

Railroad Operating Documents

The CSX *Operating Rules*, the CSX *Special Instructions*, the CSX *NO&M Timetable*, and CSX specific rules governed the crews. This territory was part of the CSX Atlanta Division Area Timetable No. 1.

The CSX operating rules and supplements were as follows:

- *CSX Operating Rules*, Sixth Edition, effective January 1, 2014
- *CSX System Special Instructions*, effective April 1, 2015
- *CSX Atlanta Area Timetable No.1,* effective October 1, 2015
- *CSX Safety Rules*, effective July 1, 2012
- *Airbrake and Train Handling Rules,* effective April 1, 2010

Train Crew **Work/Rest** Information

Table 1. Locomotive Engineer Certification Record

Last Certification Date	12/31/2015
Certification Expiration Date	12/31/2018
Last FRA Hearing and Vision Exam	03/05/2015
Last Territory Physical Characteristic Exam	01/29/2015
Last Skills Evaluation	01/27/2016
Last Rules Exam	03/31/2015

Table 2. Conductor Certification Record

Last Certification Date	12/31/2015
Certification Expiration Date	12/31/2018
Last FRA Hearing and Vision Exam	05/12/2015
Last Territory Physical Characteristic Exam	03/31/2015
Last Skills Evaluation	01/08/2016
Last Rules Exam	03/31/2015

Table 3. Locomotive Engineer 10-Day Work/Rest Schedule

Previous Time Off	On Duty- Date/Time	Off Duty- Date/Time	Total Time On Duty
16 hrs. 45 minutes	03/01/17-5:00 pm.	03/02/17-12:49 am.	7 hrs. 49 minutes
15 hrs. 26 minutes	03/02/17-4:15 pm.	03/02/17-11:35 pm.	7 hrs. 20 minutes
15 hrs. 26 minutes	03/03/17-1:30 pm.	03/04/17-1:58 am.	12 hrs. 58 minutes
51 hrs. 02 minutes	03/06/17-5:00 am.	03/06/17-5:59 pm.	12 hrs. 59 minutes
14 hrs. 31 minutes	03/07/17-8:30 am.	03/07/17-8:50: pm.	12 hrs. 20 minutes

Table 4. Conductor 10-Day Work/Rest Schedule

Previous Time Off	On Duty-Date/Time	Off Duty-Date/Time	Total Time On Duty
15 hrs. 46 minutes	02/21/17-7:00 pm.	02/22/17-7:07 am.	12 hrs. 07 minutes

11 days, 21 hrs. 53 minutes	03/06/17-5:00 am.	03/06/17-6:01 pm.	13 hrs. 01 minutes
14 hrs. 29 minutes	03/07/17-0830	03/07/17-8:49 pm	

Highway Vehicle

The motor coach (tour bus) was travelling geographically south to north on Main Street. The train struck the left side of the motor coach (tour bus) as it was traveling geographically south to north on Main Street. The tour bus was carried railroad north along the track for about 203 feet before coming to rest on the track. (For additional information, see the *Survival Factors Factual Report* in the docket.)

Highway-Rail Grade Crossing

Main Street crosses the tracks in a geographical north and south direction and intersects with Esters Boulevard, adjacent to the tracks. The posted highway speed limit was 25 mph.

The highway-railroad grade crossing was a low ground clearance crossing and was equipped with warning lights, bells, and gates. Low ground clearance warning signs were located on each side of the crossing. The highway-railroad grade crossing was asphalt with rubber flangeway approximately 36 feet in length. The railroad tracks are equipped with continuous welded rail on both sides of the crossing. (For additional information, see the *Signal Factual Report* in the docket.)

I have read and approve the details in this Factual Report.

Tomas R Torres – NTSB //s// 01/09/2018

_____ Date _____

Greg Drakulic -FRA //s// 06/19/2017

_____ Date _____

Jeremy Moats– FRA //s// 06/19/2017

_____ Date _____

D.Merrell Porter, Jr //s// No Reponse

_____ Date _____

Bob Windland- Biloxi Police Dept. //s// 06/21/2017

_____ Date _____

Brad Spencer //s// 01/09/2018

CSX Director of Train Accident Prevention

_____ Date_____