Federal Railroad Administration
Office of Railroad Safety
Accident and Analysis Branch

Accident Investigation Report
HQ-2014-1049

CSX Transportation (CSX)
Vandalia, IL
October 30, 2014

Note that 49 U.S.C. §20903 provides that no part of an accident or incident report, including this one, made by the Secretary of Transportation/Federal Railroad Administration under 49 U.S.C. §20902 may be used in a civil action for damages resulting from a matter mentioned in the report.

U.S. Department of Transportation
Federal Railroad Administration

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File #HQ-2014-1049

TRAIN SUMMARY

1. Name of Railroad Operating Train #1	1a. Alphabetic Code	1b. Railroad Accident/Incident No.
CSX Transportation	CSX	000137001

GENERAL INFORMATION

1. Name of Railroad or Other Entity Responsible for Track Maintenance	1a. Alphabetic Code	1b. Railroad Accident/Incident No.
CSX Transportation	CSX	000137001
2. U.S. DOT Grade Crossing Identification Number	**3. Date of Accident/Incident**	**4. Time of Accident/Incident**
546495N	10/30/2014	6:49 PM

5. Type of Accident/Incident
Derailment

6. Cars Carrying HAZMAT	7. HAZMAT Cars Damaged/Derailed	8. Cars Releasing HAZMAT	9. People Evacuated	10. Subdivision
8	0	0	0	St Louis Line

11. Nearest City/Town	12. Milepost *(to nearest tenth)*	13. State Abbr.	14. County
Vandalia	Q172.3	IL	FAYETTE

15. Temperature (F)	16. Visibility	17. Weather	18. Type of Track
50 °F	Dark	Rain	Main

19. Track Name/Number	20. FRA Track Class	21. Annual Track Density *(gross tons in millions)*	22. Time Table Direction
Single Main	Freight Trains-60, Passenger Trains-80	28.1	East

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OPERATING TRAIN #1

1. Type of Equipment Consist:	2. Was Equipment Attended?	3. Train Number/Symbol
Freight Train	Yes	Q33230

4. Speed (recorded speed, if available) R - Recorded E - Estimated	Code	5. Trailing Tons (gross exluding power units)	6a. Remotely Controlled Locomotive? 0 = Not a remotely controlled operation 1 = Remote control portable transmitter 2 = Remote control tower operation 3 = Remote control portable transmitter - more than one remote control transmitter	Code
47 MPH	R	9989		

6. Type of Territory

Signalization:

Signaled

Method of Operation/Authority for Movement:

Signal Indication

Supplemental/Adjunct Codes:

Q

7. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)	8. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.	Alcohol	Drugs
(1) First Involved *(derailed, struck, etc.)*	UP5183	1			0	0
(2) Causing *(if mechanical, cause reported)*				9. Was this consist transporting passengers?		No

10. Locomotive Units (Exclude EMU, DMU, and Cab Car Locomotives.)	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End e. Remote	11. Cars (Include EMU, DMU, and Cab Car Locomotives.)	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Train	2	0	0	0	0	(1) Total in Equipment Consist	69	0	34	0	0
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	0	0	0	0	0

12. Equipment Damage This Consist	13. Track, Signal, Way & Structure Damage
100	8200

14. Primary Cause Code

M302 - Highway user inattentiveness

15. Contributing Cause Code

M305 - Highway user unawareness due to environmental factors (angle of sun, etc.)

Number of Crew Members

16. Engineers/Operators	17. Firemen	18. Conductors	19. Brakemen
1	0	1	0

Length of Time on Duty

20. Engineer/Operator	21. Conductor
Hrs: 3 Mins: 50	Hrs: 3 Mins: 50

Casualties to:	22. Railroad Employees	23. Train Passengers	24. Others
Fatal	0	0	4
Nonfatal	0	0	1

25. EOT Device?	26. Was EOT Device Properly Armed?
N/A	

27. Caboose Occupied by Crew? N/A

28. Latitude	29. Longitude
38.961540000	-89.097374000

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CROSSING INFORMATION

Highway User Involved		Rail Equipment Involved
1. Type: Auto		5. Equipment: Train (Units Pulling)
2. Vehicle Speed *(est. mph at impact)*: 5	3. Direction *(geographical)*: South	6. Position of Car Unit in Train: 1
4. Position of Involved Highway User: Moved over Crossing		7. Circumstance: Rail Equipment Struck Highway User
8a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials?: Rail Equipment		8b. Was there a hazardous materials release by: Neither

8c. State here the name and quantity of the hazardous material released, if any.: N/A

9. Type of Crossing Warning	10. Signaled Crossing Warning	11. Roadway Conditions
1. Gates 4. Wig wags 7. Crossbucks 10. Flagged by crew 2. Cantilever FLS 5. Hwy. traffic signals 8. Stop signs 11. Other *(spec. in narr.)* 3. Standard FLS 6. Audible 9. Watchman 12. None 1, 3, 6	1, 1, 1	Wet

12. Location of Warning	13. Crossing Warning Interconnected with Highway Signals	14. Crossing Illuminated by Street Lights or Special Lights
Both Sides	No	Yes

15. Highway User's Age	16. Highway User's Gender	17. Highway User Went Behind or in Front of Train and Struck or was Struck by Second Train	18. Highway User
35	Female	No	Stopped and then proceeded

19. Driver Passed Standing Highway Vehicle	20. View of Track Obscured by *(primary obstruction)*
No	Other (Specify in Narrative)

Casualties to:	Killed	Injured	21. Driver was	22. Was Driver in the Vehicle?
			Killed	Yes
23. Highway-Rail Crossing Users	4	1	24. Highway Vehicle Property Damage *(est. dollar damage)*: 6500	25. Total Number of Vehicle Occupants *(including driver)*: 5

26. Locomotive Auxiliary Lights?	27. Locomotive Auxiliary Lights Operational?
Yes	Yes
28. Locomotive Headlight Illuminated?	29. Locomotive Audible Warning Sounded?
Yes	Yes

10. Signaled Crossing Warning

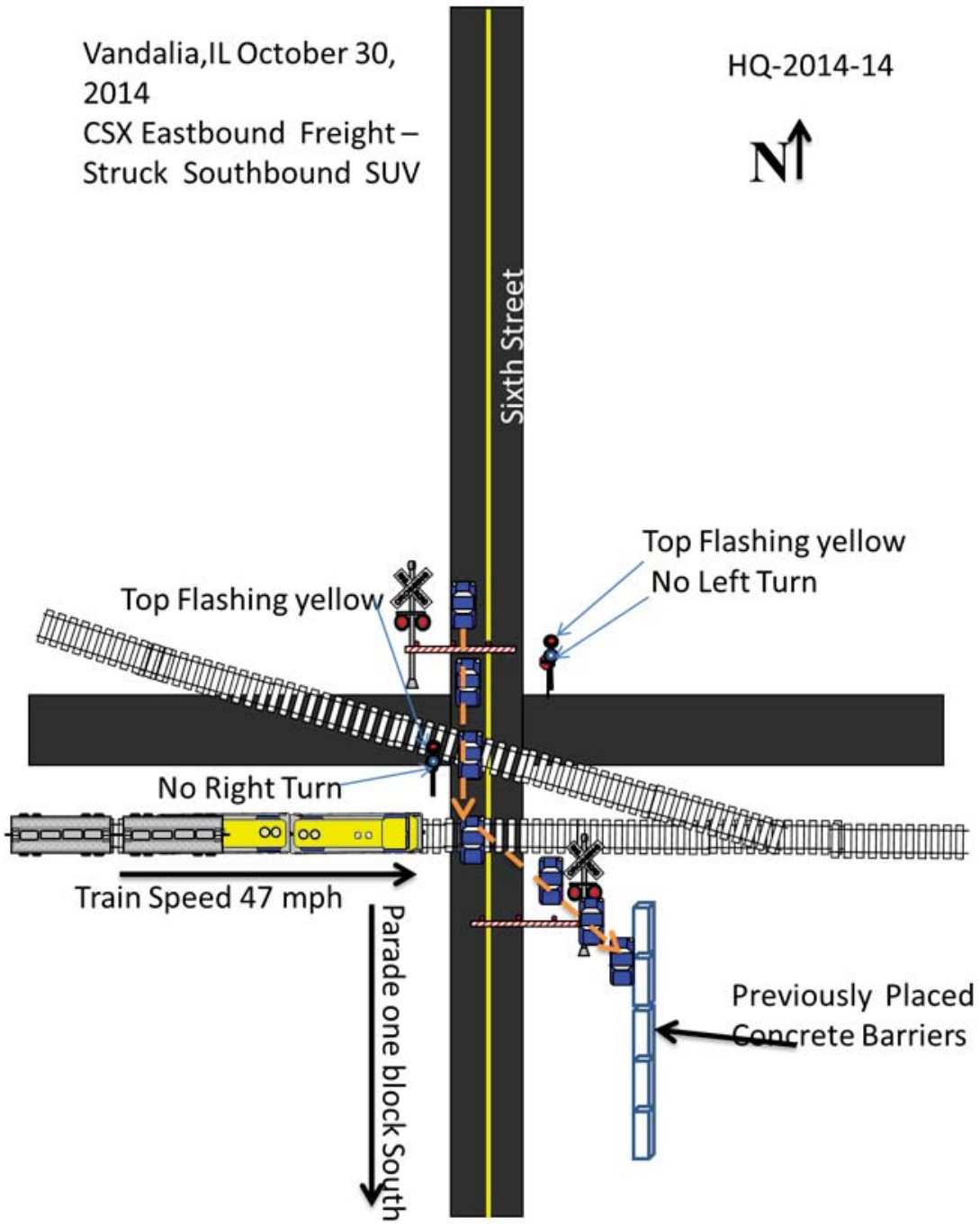
1 - Provided minimum 20-second warning
2 - Alleged warning time greater than 60 seconds
3 - Alleged warning time less than 20 seconds
4 - Alleged no warning
5 - Confirmed warning time greater than 60 seconds
6 - Confirmed warning time less than 20 seconds
7 - Confirmed no warning
N/A - N/A

Explanation Code

A - Insulated rail vehicle
B - Storm/lightning damage
C - Vandalism
D - No power/batteries dead
E - Devices down for repair
F - Devices out of service
G - Warning time greater than 60 seconds attributed to accident-involved train stopping short of the crossing, but within track circuit limits, while warning devices remain continuously active with no other in-motion train present
H - Warning time greater than 60 seconds attributed to track circuit failure (e.g., insulated rail joint or rail bonding failure, track or ballast fouled)
J - Warning time greater than 60 seconds attributed to other train/equipment within track circuit limits
K - Warning time less than 20 seconds attributed to signals timing out before train's arrival at the crossing/island circuit
L - Warning time less than 20 seconds attributed to train operating counter to track circuit design direction
M - Warning time less than 20 seconds attributed to train speed in excess of track circuit's design speed
N - Warning time less than 20 seconds attributed to signal system's failure to detect train approach
O - Warning time less than 20 seconds attributed to violation of special train operating instructions
P - No warning attributed to signal systems failure to detect the train
R - Other cause(s). Explain in Narrative Description

SKETCHES

Sketch of Scene



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SYNOPSIS

On October 30, 2014, at 6:49 p.m., an eastbound CSX Transportation (CSX) freight train traveling on single main track, in train control system territory collided with an automobile at a highway-rail grade crossing. The accident occurred in Vandalia, Illinois, at Milepost (MP) Q172.3, on CSX's St. Louis Line Subdivision. The motor vehicle driver and three passengers were killed. One passenger survived and the automobile was completely destroyed. The U.S. DOT Crossing Number is 546495N and was equipped with gates and standard flashing lights. There were no injuries to the train crew. The leading locomotive sustained minor damage of about $100, and there was no derailment.

At the time of the accident, it was evening, dark, and light rain. The temperature was 50 degrees F.

The accident was caused by failure of the motor vehicle driver to yield to the train. The Primary Cause Code was determined to be M302- Highway user inattentiveness. The contributing Cause was identified as M305 - Highway user unawareness due to environmental factors (angle of sun, etc.)

NARRATIVE

Circumstances Prior to the Accident

The crew of CSX Transportation (CSX) Train Q33230 included a locomotive engineer, and a conductor. They first went on duty at 3:00 p.m., CST, October 30, 2014, at CSX's Rose Lake Yard Office in East St. Louis, Illinois. This was the away from home terminal for both crew members, and both received more than the statutory off-duty period prior to reporting for duty.

Their assigned freight train consisted of 2 locomotives, 69 loaded, and 34 empty cars of several varieties. It was 6,806 feet long, and weighed 9,989 tons. The train was scheduled to travel to Indianapolis, Indiana. Records indicate the train originated on the St. Louis Terminal Railroad (TRRA) at Madison, Illinois, with 81 cars.. The Class I air brake test was performed by TRRA-qualified mechanical inspectors at Madison. The train traveled approximately 3 miles to CSX Rose Lake Yard in East St. Louis where cars were removed and added to the train. Records indicate the head 40 cars were set out at Rose Lake Yard and 59 cars were added to the head-end and 3 cars added to the rear-end of the train. Records indicate a Class I air brake test was performed on the rear 3 cars in Track Number E03 and a Class III air brake test and roll-by inspection of the entire train (103 cars) at Rose Lake Yard by a CSX-qualified mechanical inspector. The train consist was not changed after departing Rose Lake Yard.

As the eastbound train approached the accident area, the Locomotive Engineer was seated at the controls on the south side of the leading locomotive. The Conductor was seated on the north side of the cab of the leading locomotive.

In this area, the track is tangent approaching the 6th Street crossing. There is a 0.72-percent descending grade which reduces to 0.22 at or near the 6th Street crossing. Traveling eastbound there are two road crossings encountered before 6th Street and one after with-in an overall distance of 3,000 feet. CSX's track charts and wiring diagrams show this area to be double track and have not been updated since this has been reduced to single track. In this area of 6th Street, Main Street parallels the main line on the north side. Traveling north to south on 6th Street, the grade is slightly sloping upward and level after the crossing. Just east of the 6th Street crossing is a switch to the Vandalia Railroad Company (VRRC) which diverges in a northwest direction across 6th and Main Street. The 6th Street crosses two sets of track at this crossing.

The City of Vandalia was having a Halloween parade and celebration at this particular time and date which brought hundreds of people to the downtown district. CSX, nor the train crew, was notified of the celebration and was unaware of the crowded conditions and activities from this gathering. The 6th Street crossing is just one block north of the downtown business district where the parade was to take place. Numerous vehicles were parked parallel to the main line between Main Street and north of the main line. Numerous vehicles were also on Main Street facing east with their headlights on which is the same direction the train was traveling from. The north crossing gate and lights that protect the southbound 6th Street vehicle traffic is located at the northwest corner of 6th and Main Street. There are no gates, signs, or lights on the west side of 6th Street between Main Street and the main line track to protect 6th Street southbound traffic. The distance between the southbound crossing gate and the center line of the track leading to the VRRC is approximately 29 feet. The distance between the VRRC track and the center line of the main line is approximately 41 feet. Traffic on Main Street is protected by a signal pole with two lights and a stop sign mounted on it. The top light flashes yellow and the bottom illuminates "no right turn" (or "no left turn" for vehicles traveling westbound) when activated by an approaching train. All warning signals activate at the same time when a train approaches. There is also a yellow advanced warning sign on 6th Street 145 feet north of the crossing gate. There are not any painted warnings on the road. Vehicle traffic was heavy southbound on 6th Street and both directions on Main Street due to the city's parade.

This is single main track and train control system signal territory as indicated by railroad timetable. The railroad timetable direction of the train was east. The geographic direction was east. Timetable directions are used throughout this report.

The Accident

Train Q33230 East

The eastbound train was being operated at 47 mph with the dynamic brake in position Number 4 approaching the accident area. The train crews' view of the crossing was partially obstructed to southbound vehicle traffic by the vehicles on Main Street, west of 6th Street. The view was somewhat blurred from the light rain on the front windows and the lights from the vehicle traffic and warning devices. The Engineer and Conductor noticed the heavy traffic in the area and the Engineer started applying the horn more than usual to warn the pedestrians and traffic of their approach. As the train approached 6th Street, the silver Chrysler Pacifica SUV became visible to the crew from behind the traffic on Main Street and traveled south into the path of the train. The lead locomotive struck the vehicle on the passenger side. The Engineer immediately initiated a controlled stop by applying a full service brake application with the automatic brake valve. The speed was recorded by the event recorder of the controlling locomotive. The lead locomotive was equipped with an on board video camera which recorded the collision. The maximum authorized speed for this train was 60 mph, as designated in the current CSX Timetable Number 6.1.

Highway Vehicle

The motor vehicle was traveling north to south on 6th Street and occupied by the driver and four passengers. According to three witnesses, the vehicle was waiting in traffic on 6th Street at the intersection of 6th and Main Street and the railroad tracks. As traffic cleared ahead of the vehicle, the crossing gates and lights were activated at U.S. DOT Crossing Number 546495N by the approaching train. The gate at the northwest corner of 6th and Main Street came down behind the vehicle. The vehicle then backed up in a north direction to the gate and stopped. As the train approached the crossing, the vehicle started to move south at a slow rate of speed and was struck by the train. The speed limit for south traffic at this location is 30 mph. The speed limit is not posted, but governed by City Ordinance 10.08.010.

The lead locomotive struck the right side toward the rear of the motor vehicle. The vehicle then spun clockwise as it separated from the train. The front passenger portion of the vehicle then struck the signal post/crossing gate at the southeast corner of the crossing. The vehicle continued to spin clockwise until it came to rest facing southwest with the driver's side rear tire pinned against a concrete barrier. During the impact with the crossing gate/signal pole, the male seated in the driver's side third row seat was ejected through the rear window and landed approximately 60 feet south of the tracks and against the concrete barrier. The crossing gate/signal post broke and came to rest on top of the vehicle.

After the collision, the Engineer immediately made an emergency call to the Dispatcher and explained what had happened. The head-end of the train came to rest east of the Kaskaskia River Bridge, approximately 1-mile from the collision at MP QS171.3. The Engineer stated he made a controlled stop instead of placing the train into emergency due to the scattered placement of cars carrying hazardous materials throughout the train and he did not want to risk derailing the train in downtown Vandalia with all the pedestrians around. The Conductor walked the train back about 25 cars to the river bridge and took no exceptions to the train. He was unable to walk any further due to unsafe passage over the bridge. The locomotive received slight damage to the hand rail which was repaired prior to departure. The crew remained on the lead locomotive until they were relieved by another crew. While waiting for the relief crew, the crew was interviewed by CSX's Trainmaster, and local police officers. Once the crew was relieved, they were taken to their home terminal of Indianapolis via taxi/van.

The accident scene was assisted and investigated by local Vandalia Police, CSX Police, Illinois State Police, Vandalia Fire Department, Fayette County Ambulance, and Fayette County Coroner. A CSX track inspector was also assisting who was also a witness to the accident. The Track Inspector was watching the parade off duty when he witnessed the accident one block north of where he was standing. He immediately went to the vehicle after the crash and concluded he could not do much with the victims. The Track Inspector then crossed through the stopped train and asked for someone to give him a ride home to obtain his company truck and radio to assist with the train crew. Three of the passengers were pronounced dead at the scene. The driver was taken to St. Louis University Hospital in St. Louis, Missouri and died at 12:25 p.m. the next day. The passenger seated behind the driver was the only survivor and was taken to Children's Hospital in St. Louis for a broken arm and other, non-life threatening injuries.

Damages were estimated at $100 to the locomotive, $6,500 to the vehicle, and $8,200 to the crossing gate/signal post. A third vehicle also sustained slight damage to the left front corner from flying debris with an unknown damage amount. This vehicle was parked on the east side of 6th Street, south of the main line and unoccupied at the time of the accident.

Analysis and Conclusions

Analysis - Toxicological Testing: There were no toxicological tests performed on the driver or passengers of the vehicle. There were no toxicological tests performed on the train crew. Federal Railroad Administration (FRA) does not require such testing for this type of accident.

Conclusion: N/A.

Analysis - Highway-Rail Grade Crossing (Active Warning Devices): The highway-rail crossing at grade is equipped with warning lights, bells, and gates. There is an advance warning sign posted about 145 feet north of the crossing. There are not pavement markings at this crossing. The view of the railroad to the west is unobstructed.

The railroad has a whistle post in place about 3,363 feet west of the crossing. This whistle post is marked for multiple crossings. Both crew members said the Locomotive Engineer began sounding the horn when the train neared this post. Numerous witnesses said they heard the train horn being sounded as the train approached the crossing. This was later validated by analysis of the event recorder data.

The active warning devices were tested by a CSX signal maintainer on October 31, 2014, with no exceptions taken. The active warning devices were tested again by a CSX signal maintainer in the presence of an FRA Chief Inspector and an Illinois Commerce Commission Signal Inspector on November 18, 2014. The warning devices worked as intended. The distance between the crossing and the crossing termination shunt was also measured at this time and measured 2,663 feet. This would give a 30-second activation warning for a train traveling at 60 mph.

Conclusion: The crossing is in relatively good condition. The warning devices functioned as intended.

Analysis - Locomotive Safety Devices: The leading locomotive was equipped with a headlight, the auxiliary lights, and the audible warning devices required by Federal regulations. Witnesses said they heard the horn, bell, and saw the lights of the locomotive. A photograph was taken by a CSX employee after the accident which illustrates that the lights on the locomotive were operational.

Lead Locomotive Number UP 5183 received a complete sound level test of the horn at Avon Yard in Indianapolis, Indiana on November 10, 2014, by DMR & Associates, Incorporated. The results of this test were below the required sound level of 96 decibels as required by the Code of Federal Regulations (CFR) Section 229.129(a).

Conclusion: The locomotive horn was not in full compliance with Federal requirements.

Analysis - Locomotive Engineer Operating Performance: The locomotive was equipped with a speed indicator and an event recorder, as required. The relevant event recorder data was downloaded by the trainmaster at the accident site and analyzed by CSX and FRA.

Conclusion: The Locomotive Engineer was in compliance with all applicable railroad operating and train handling requirements.

Fatigue Analysis: FRA obtained fatigue-related information for the 10-day period preceding this accident/incident, including the 10-day work history (on-duty/off-duty cycles) for all of the employees involved.

Conclusion: Upon analysis of that information, FRA concluded fatigue was not probable for any of the employees.

Analysis - Train inspection: The train was inspected by CSX-qualified mechanical inspectors on October 31, 2014, at Avon Yard. No cars were bad ordered from this inspection.

Conclusion: No defective conditions were found by CSX inspectors at Avon Yard.

Analysis - Outbound air brake test and pre-departure inspections: The air brake slip required under CFR § 232.205(e) was requested and not provided by CSX. CSX responded that there are no retention requirements to maintain that document. Further investigation revealed the train originated on the TRRA and the TRRA had a copy of the original air slip which was obtained. Further investigation revealed the trains' consist was changed at Rose Lake Yard by removing a block of cars from the head-end of the train and adding two blocks of cars. One block of 59 cars was added to the head-end of the train and a block of three cars were added to the rear. This was determined by comparing the inbound and outbound (Automatic Equipment Identification (AEI)) scans of the train. Review of the train's inspection records at Rose Lake Yard revealed a Class I air brake test was performed on three cars and a Class III air brake test and a roll-by inspection on 103 cars.

Conclusion: The train departed Rose Lake Yard without the required inspections: CFR § 232.205(a), Class I air brake test, and CFR § 215.13(b), Pre-departure inspection of 59 cars.

Analysis - Accident Reconstruction: The Illinois State Police formed an accident reconstruction team and reconstructed the accident. The results of this reconstruction are not available at the time this report was written and will be available when completed. The average time to complete this investigation and final report is 6 months.

Conclusion: The report will be available through the Illinois State Police in Springfield, Illinois, when completed.

Probable Cause and Contributing Factors: FRA concluded that the accident occurred because the driver of the motor vehicle failed to stop at the highway-rail grade crossing and yield to the train. Heavy traffic ahead of the southbound vehicle, parked vehicles on Main Street west of the intersection, the added glare from headlights of the vehicles, and the design of the intersection with the current warning devices may have been a contributing factor.

The accident was caused by failure of the motor vehicle driver to yield to the train. The Primary Cause Code was determined to be M302- Highway user inattentiveness. The contributing Cause was identified as M305 - Highway user unawareness due to environmental factors (angle of sun, etc.).