



***Federal Railroad Administration
Office of Railroad Safety
Accident and Analysis Branch***

***Accident Investigation Report
HQ-2016-1112***

***CSX Transportation (CSX)
Marysville, OH
February 9, 2016***

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.

SYNOPSIS

Synopsis

On February 9, 2016, at approximately 9:55 a.m., EST, CSX Transportation (CSX) Train H71109 derailed two locomotives and three intermodal cars while traveling from CSX's Columbus Van Yard in Columbus, Ohio, to CSX's Marysville Honda in Marysville, Ohio. Train H71109 was traveling with an EC-1 granting authority on the Scottslawn Secondary in a timetable north direction with five intermodal double stacked cars. Approximately 15 miles into their trip, Train H71109 approached the south-end of the Scotts Fertilizer rail siding at Milepost QT 108.3 and encountered a misaligned switch, immediately directing the train into the industry where it struck a cut of five covered hoppers before derailling and coming to rest.

The impact resulted in derailment of both locomotives and three intermodal cars. Lead Locomotive CSX 3023 was derailed in the upright position and trailing Locomotive CSX 3135 was derailed on its right side, resulting in a minor lube oil leak that was quickly contained. The three intermodal cars derailed accounted for a total of 16 freight containers dislodged from their car bodies. There were no reported evacuations, no hazardous material leaks, and no hazardous materials within the train consist.

Train H71109 was traveling 39 mph when entering the industry track, and impacted at a recorded speed of 35 mph. Maximum authorized speed while operating on the main track on the Scottslawn Secondary is 49 mph (CSX Great Lakes Division Timetable). The method of operation is Track Warrant Control.

Two crew members were on the lead locomotive at the time of derailment and both were struck with debris coming through the windshield following the point of impact. Both crew members reportedly walked under their own ability to the ambulance and were then taken to a local hospital where they were treated for lacerations and bruising before being released.

The accident occurred during daylight hours, with weather conditions consisting of snow flurries and a temperature of 25 °F.

Monetary damages amounted to \$459,860 for equipment and \$189,045 for track, totaling \$648,905 in monetary damages.

The primary accident cause was (H702) "Improperly lined switch." The Savage Industrial Rail Services (SIRS) crew failed to return the 908-main line switch to its normal position in accordance with Title 49 Code of Federal Regulations (CFR) Section 218.105(b) which states, "The normal position of a hand-operated main track switch shall be designated by the railroad in writing and the switch shall be lined and locked in that position when not in use." Additionally, the failure of SIRS' crew to comply with 49 CFR § 218.105(c)(1), additional job briefing requirements for hand-operated main track switches, which states, "before a train or a train crew leaves the location where any hand-operated main track switch was operated, all crewmembers shall have verbal communication to confirm the position of the switch." A contributing factor to the derailment was (H405) "Train orders, track warrants, direct traffic control, track

bulletins, radio, error in preparation, transmission or delivery.” CSX’s Dispatcher failed to comply with CSX Operating Rule 608.9 by not getting the switch time and names of persons who operated switches in non-signaled territory before clearing the SIRS crew’s track authority.

This was not an Amtrak route and not a PTC route, however, it was a crude oil route.

TRAIN SUMMARY

1. Name of Railroad Operating Train #1 CSX Transportation	1a. Alphabetic Code CSX	1b. Railroad Accident/Incident No. 000156961
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GENERAL INFORMATION

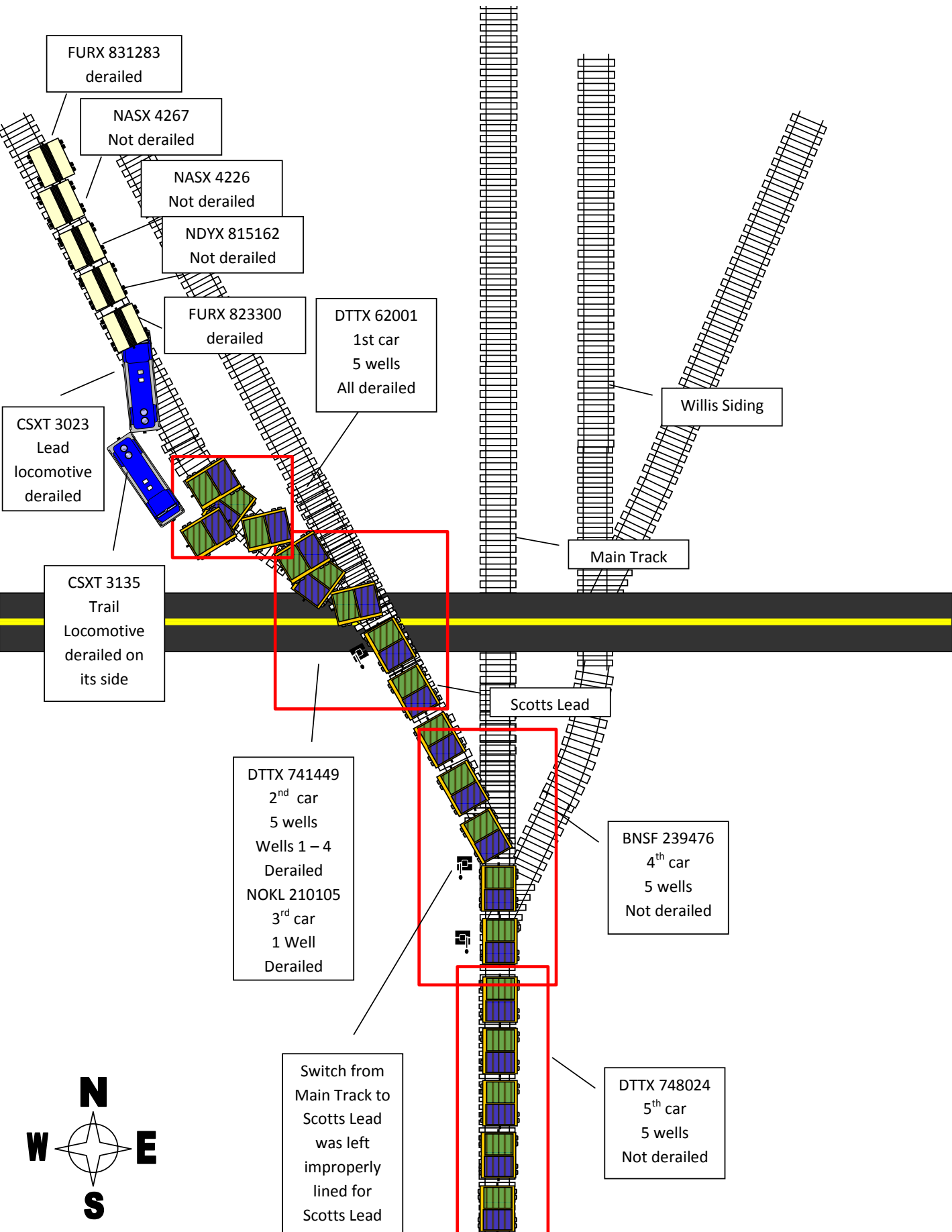
1. Name of Railroad or Other Entity Responsible for Track Maintenance Savage Industrial Rail Services, Inc.	1a. Alphabetic Code SIRS	1b. Railroad Accident/Incident No. Industry
2. U.S. DOT Grade Crossing Identification Number	3. Date of Accident/Incident 2/9/2016	4. Time of Accident/Incident 9:55 AM
5. Type of Accident/Incident Other (Describe in Narrative)		
6. Cars Carrying HAZMAT 0	7. HAZMAT Cars Damaged/Derailed 0	8. Cars Releasing HAZMAT 0
	9. People Evacuated 0	10. Subdivision Scotts Lawn Secondary (SB)
11. Nearest City/Town Marysville	12. Milepost (to nearest tenth) QT108.3	13. State Abbr. OH
		14. County UNION
15. Temperature (F) 25 °F	16. Visibility Day	17. Weather Snow
		18. Type of Track Industry
19. Track Name/Number 908	20. FRA Track Class Freight Trains-10, Passenger Trains-15	21. Annual Track Density (gross tons in millions)
		22. Time Table Direction North

OPERATING TRAIN #1

1. Type of Equipment Consist: Freight Train					2. Was Equipment Attended? Yes		3. Train Number/Symbol H71109				
4. Speed (recorded speed, if available) R - Recorded 35 MPH E - Estimated		Code R	5. Trailing Tons (gross excluding power units) 1511		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 0	
6. Type of Territory Signalization: <u>Not Signaled</u> Method of Operation/Authority for Movement: <u>Other Than Main Track</u> Supplemental/Adjunct Codes: <u>T</u>											
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 <i>(derailed, struck, etc.)</i>		CSXT3023		1		no				0	0
(2) Causing <i>(if mechanical, cause reported)</i>		0		0		no		9. Was this consist transporting passengers?			No
10. Locomotive Units (Exclude EMU, DMU, and Cab Car Locomotives.)	a. Head End	Mid Train		Rear End		11. Cars (Include EMU, DMU, and Cab Car Locomotives.)	Loaded		Empty		e. Caboose
		b. Manual	c. Remote	d. Manual	e. Remote		a. Freight	b. Pass.	c. Freight	d. Pass.	
(1) Total in Train	2	0	0	0	0	(1) Total in Equipment Consist	5	0	0	0	0
(2) Total Derailed	2	0	0	0	0	(2) Total Derailed	3	0	0	0	0
12. Equipment Damage This Consist 459860			13. Track, Signal, Way & Structure Damage 189045								
14. Primary Cause Code H702 - Switch improperly lined											
15. Contributing Cause Code H405 - Train orders, track warrants, direct traffic control, track bulletins, radio, error in preparation, transmission or delivery											
Number of Crew Members						Length of Time on Duty					
16. Engineers/Operators		17. Firemen		18. Conductors		19. Brakemen		20. Engineer/Operator		21. Conductor	
1		0		1		0		Hrs: 2 Mins: 27		Hrs: 2 Mins: 27	
Casualties to:		22. Railroad Employees		23. Train Passengers		24. Others		25. EOT Device?		26. Was EOT Device Properly Armed?	
Fatal		0		0		0		Yes		Yes	
Nonfatal		2		0		0		27. Caboose Occupied by Crew?			N/A
28. Latitude 40.236448600				29. Longitude -83.367143200							

SKETCHES

SKETCH



NARRATIVE

Circumstances Prior to the Accident*Savage Industrial Rail Services Train Crew Z500*

The crew of Savage Industrial Rail Services' (SIRS) Train Z500 began their shift at 6:00 a.m., EST, on February 9, 2016, at Scotts Lawn Fertilizer Plant, their home terminal and regular on-duty location, in Marysville, Ohio. The crew consisted of an engineer, conductor, and brakeman. The Federal Railroad Administration (FRA) was unable to determine if any crew member had received the statutory off-duty period prior to reporting for work due to the lack of hours of service (HOS) records maintained by SIRS.

The crew had worked 9 days in a row performing covered service. Following the yard sweep, the crew conducted a job briefing and went over their bulletins, then began switching operations at approximately 7:00 a.m. The crew began their work on the east side of the plant, using Locomotives SVGX 8609-SVGX 7104.

In the accident area, a single main track owned by CSX Transportation (CSX) was designated as the Great Lakes Division, Scotts Lawn Secondary Subdivision, with a maximum authorized speed (MAS) of 49 mph. The Scotts Lawn Secondary Subdivision is non-signaled track that utilizes a Track Warrant Control (TWC-D) system for occupancy of the main track and sidings. Authority is given, and documented in the form of an East Coast Movement Instruction (EC-1). The accident occurred at MP QT 108.3, approximately 3.5 miles southeast of downtown Marysville. CSX's main track runs geographically from southeast to the northwest, but is railroad timetable "north"; for the purposes of this memorandum timetable direction "north" and "south" will be utilized.

The Scotts facility is bisected by CSX's main track with Scotts industrial track on both the east and west side of the main track with a MAS of 10 mph. To the immediate south of the Scotts facility is Scotts Lawn Road which extends eastward and westward crossing CSX's main track and industrial track. Traveling north on the single main track towards the accident site there is a siding track (Willis Siding) beginning 350 feet south of Scotts Lawn Road. Willis Siding parallels the main track on the east side.

Approximately 110 feet north of the south-end Willis Siding switch is a main track switch, the 908 switch, that is located on the west side of the main track. The 908 switch (Scotts Lead switch) provides access to the industrial yard portion of the Scotts facility, located on the west side of the main track. Both switches are located to the south of the Scotts facility and south of Scotts Lawn Road. SIRS' crew is required to contact CSX's Dispatcher for main track authority to cross over from the east side to the west side of the facility. SIRS sometimes keeps that main track authority for switching head room.

At the time of the accident, weather conditions were light snow with sustained winds of 14 mph and wind gusts of upwards to 20 mph from the west.

At 7:36 a.m., Train Z500 contacted CSX's Dispatcher for permission onto Willis Siding, and at 7:39 a.m., they received EC-1 Number 75846 granting authority from North-End Willis Siding to South-End Willis Siding with permission for continuous switching movements. The Engineer copied the EC-1, recording the Conductor's initials, but failed to transmit the EC-1 to the Conductor. The crew switched on the east side until approximately 8:30 a.m.

At 8:33 a.m., Train Z500 received EC-1 Number 76012 for limits between Willis Main Track and Fladt

Main Track with permission for continuous switching movements, again copied by the Engineer and relayed to the Conductor. They operated the first CSX main line switch at 8:36 a.m., opening up the South Lead Switch (coming out of the East Yard southward onto CSX's main line). There are two other CSX main line switches at the south-end of the plant, the 911 (furthest north) and 908. Both switches are located north of the South Lead Switch and grant access to the west side of the plant. Train Z500 operated the 911 switch at 8:43 a.m., and the 908 switch at 8:48 a.m., then began switching in the West Yard, utilizing CSX's main track until approximately 9:45 a.m.

At approximately 9:35 a.m., Train Z500 was operating on CSX's main track with two engines and three cars south of the South Lead Switch en route to the east side of the plant. The Brakeman placed the derails back in the derailing position for the 908 and 911 switches and locked them. He then lined the 911 switch back to normal (main track movement) and locked it, reporting the time (9:36 a.m.) to the Engineer for the Switch Position Awareness Form (SPAF).

No matter who operates the switch, the "Engineer for the day" records the "Conductor for the day," as the person having operated the switch, regardless of whether it was the Brakeman or the Conductor. The Brakeman then walked toward the east side of the plant to get into position to protect the shove north into the east side of the plant, as well as protect the highway rail grade crossing (Scotts Lawn Road). The Brakeman did not operate the 908 switch back to the normal position because it was further away from his position and closer to that of the Conductor, who was operating the south-end lead switch. Train Z500 shoved northward into the east side of the plant and cleared the crossing at Scotts Lawn Road, stopping north of the derail for the lead. The Conductor operated the south-end lead switch at approximately 9:47 a.m. (recorded erroneously as 9:50 a.m. on the SPAF) and the derail for the switch, then locked them both. He then told the Engineer to clear their mainline authority, unaware that the 908 switch was still lined for movement into the industry.

At 9:48 a.m., Train Z500's Engineer released their Main Track Authority EC-1 Number 76012 between Willis and Fladt. The Engineer failed to check the SPAF (by admission), and CSX's Dispatcher failed to get the switch times and operating employee name from the SPAF before clearing the authority (audio and transcripts attached). The transmission resulted in the EC-1 being successfully released while the SPAF still indicated the 908 switch had not been lined back to normal, and for main track movement.

Following the release of their authority and reporting clear of the main line, since this was non-signaled territory, there was no alternative way of knowing the 908 switch was still lined for movement into track 908 on the west side of the industry.

CSX H71109 North

The crew of Train CSX H71109 was on duty at their home terminal, Columbus Van Yard, at 7:00 a.m.

The crew consisted of an engineer and conductor, both of which had been off duty for 17 hours and 22 minutes, well-exceeding their required statutory off-duty time prior to reporting for duty. The crew received a job and safety briefing from the Yardmaster, then boarded their train, consisting of five loaded well cars at 1,353 feet and weighing 1,511 tons. The train did not require an initial terminal air brake test as the entire train consisted of a solid block of cars and two locomotives arriving on Q14608, which was previously tested and not off-air for a period exceeding 4 hours. At 9:04 a.m., Train H71109 departed the Van Yard onto a brief stretch of track controlled by Norfolk Southern Railway before receiving authority (EC-1 No. 76137 recorded at 9:09 a.m.) to enter the Scotts Lawn Secondary (TWC-D) between Darby

and Fladt. At 9:37 a.m., while traveling northbound towards Marysville, Train H71109 stopped short of Station Fladt due to the presence of SIRS' crew working ahead. At 9:50 a.m., Train H71109 received EC-1 Number 76326 granting authority from Fladt to Gar and the train proceeded north. As Train H71109 approached the accident area, the Engineer was seated at the engine controls on the east side of the locomotive, and the Conductor was seated on the west side of the leading locomotive. CSX intermodal Train H71109 was traveling timetable north (geographic northwest) on tangent track from Columbus to Marysville when they approached the derailment location. Track charts indicate a 0.12-percent descending grade (on the main track) in the direction of travel for 4 miles prior to the derailment location. This grade levels off after the Pocket Track switch at the Scotts plant and begins an ascent of 0.15-percent prior to the improperly lined 908 switch.

The Accident

Train CSX H71109 operated at 43 mph approaching the accident area. The MAS for the main track is 49 mph per CSX's Great Lakes Division Timetable, while the MAS to the other-than-main track Scotts Lead is 10 mph.

At 9:54 a.m., the Engineer placed the train into emergency after observing the 908 Scotts Lead switch was not lined for the main track. At 9:55 a.m., Train H71109 traveled through the misaligned switch at 39 mph, as recorded on the event recorder of the lead locomotive, and entered the Scotts Plant striking five covered hoppers loaded with potash in track 908 at 35 mph, sending part of the first covered hopper through the cab of the lead locomotive. The impact derailed lead Locomotive CSX 3023 upright and overturned second Locomotive CSX 3135, along with the first two five-pack stack cars in the train, loaded with Honda Motor parts. The Engineer and the Conductor of Train H71109 received injuries due to the impact.

At 9:55 a.m., the Engineer of Train Z500 observed the collision and called CSX's Dispatcher to report that Train H71109 had collided with standing cars in the plant, and explained that the crew of Train Z500 had unintentionally left the switch open. The Engineer and Conductor of Train CSX H71109 reportedly both walked under their own ability to the ambulance and were transported to the local hospital where they were treated for lacerations and bruising before being released the same day. They have been unavailable for comment to the Federal Railroad Administration (FRA) and CSX at the time of this report.

There was a minor lube oil leak of less than 5 gallons from the overturned locomotive which was quickly contained. There were no evacuations. Known responders to the accident included the Marysville Fire Department and emergency medical technicians, the Union County Sheriff's Office, the Ohio State Highway Patrol, the Marysville Police Department, the Ohio Environmental Protection Agency, and the Union County Emergency Management Agency. FRA's Operating Practices, Track, and Mechanical Inspectors investigated the accident.

Analysis and Conclusions

Analysis-Toxicology Testing: Post-Accident Toxicology testing was conducted on all three SIRS employees.

Conclusion: Test results were negative for the Engineer, Brakeman, and Conductor.

Analysis-Fatigue: FRA obtained fatigue-related information for the 10-day period preceding the derailment including the 10-day work history (on duty/off duty cycles for the Engineer and Conductor).

Conclusion: FRA concluded that fatigue of the train crew was not a contributing factor in the derailment.

Analysis-Locomotive Event Recorders: The relevant event recorder data was downloaded by CSX's Road Foreman of Engines and analyzed by CSX officials. Recorded train speed at the time of impact was 35 mph. MAS for Train H71109 on the main track was 49 mph per division timetable.

Conclusion: The locomotive was equipped with a speed indicator and event recorder as required by Federal regulations. CSX Train H71109 was traveling at a speed under the MAS for the Scotts Lawn Secondary main track.

Analysis-HOS: CSX carrier records were obtained for both train crewmembers and both dispatchers and all employees were rested before going on duty.

SIRS' train crew did not keep any HOS records for their crewmembers; they kept only timesheets. The crew indicated that they had worked 9 days in a row prior to the incident.

Conclusion: SIRS' train crew members were in violation of Federal HOS record keeping regulation, Title 49 Code of Federal Regulations (CFR) Part 228.

Analysis-Crew Interviews: CSX's employees were unavailable for interview. Their PI-1 CSX injury forms are attached. SIRS' crew members were interviewed.

Conclusion: SIRS' crew accepted responsibility for the incident, their reports of interview and crew statements are attached.

Analysis-CSX Dispatcher Training and Experience: CSX's Dispatcher that cleared the EC-1 for SIRS' train crew had 7 years' experience as a dispatcher and was qualifying on the IE desk on February 9, 2016, with a qualified dispatcher who had over 15 years' experience. Records indicated that the dispatchers had been trained on the requirements of Title 49 CFR Section 218.105.

Conclusion: CSX's Dispatcher's failure to comply with railroad operating rules resulted in a contributing factor to this accident. Required employee names and switch times were not documented before releasing Train Z500's EC-1 authority.

Analysis-SIRS Train Employee Training and Experience: SIRS' Engineer had been working for 12 years as a locomotive engineer and conductor exclusively for SIRS where the incident occurred. The Conductor had been working for 10 years as a locomotive engineer and conductor exclusively for SIRS where the incident occurred. The Brakeman had been working for 15 years as a locomotive engineer and conductor (also Operations Manager) exclusively for SIRS where the incident occurred. The entire crew had worked together for at least 10 years. Records indicated that the employees had been trained on the requirements of Title 49 CFR § 218.105.

Conclusion: FRA determined the SIRS train crew's failure to comply with railroad operating rules and Federal railroad safety regulations was the primary cause of this accident.

Overall Conclusion

Railroad employees for both CSX and SIRS failed to comply with Federal safety regulations and railroad operating rules causing this accident. Train Z500 SIRS crew failed to line a mainline switch back to the normal position before releasing an EC-1 authority to the dispatcher. CSX's Dispatcher failed to get the required names and times regarding the mainline switch (908) before releasing Train Z500's EC-1 authority and granting authority for movement to Train H71109. Train H71109's crew was in compliance with CSX standards and applicable Federal regulations.

Probable Cause and Contributing Factors

The primary accident cause was determined to be H702-Switch Improperly Lined. The accident was a result of the failure of SIRS' crew to return the 908-mainline switch to its normal position in accordance with Title 49 CFR § 218.105(b), *Designating switch position*. "The normal position of a hand-operated main track switch shall be designated by the railroad in writing and the switch shall be lined and locked in that position when not in use." Additionally, the SIRS crew failed to verbally confirm the position of the switch in compliance with Title 49 CFR § 218.105(c)(1), *Additional job briefing requirements for hand-operated main track switches*. "Before a train or a train crew leaves the location where any hand-operated main track switch was operated, all crewmembers shall have verbal communication to confirm the position of the switch."

A contributing factor to the accident was H405-Train orders, track warrants, direct traffic control, track bulletins, radio, error in preparation, transmission or delivery. The CSX Dispatcher's failure to comply with CSX Operating Rule 608.9 by not getting switch times and names of persons who operated switches in non-signaled territory before clearing Train Z500's track authority resulted in the 908 switch being left open with the appearance and assumption that all switches were lined for main track movement. This action violated Title 49 CFR

§ 218.105 which reads, in part:

Each railroad shall adopt and comply with an operating rule which complies with the requirements of this section. When any person including, but not limited to, each railroad, railroad officer, supervisor, and employee violates any requirement of an operating rule which complies with the requirements of this section, that person shall be considered to have violated the requirements of this section.

CSX's Dispatcher also violated Title 49 CFR § 218.105(d), which states that after the release of a main track authority where a hand-operated switch was used to clear the main, the dispatcher shall repeat the reported switch position information to the employee releasing the limits and ask whether that is correct.