



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

***Accident Investigation Report  
HQ-2015-1041***

***Southwestern Railroad Company, Incorporated (SW)  
Chisum, NM  
April 28, 2015***

***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.***

**TRAIN SUMMARY**

1. Name of Railroad Operating Train #1 Southwestern Railroad Company, Incorporated	1a. Alphabetic Code SW	1b. Railroad Accident/Incident No. HQ-2015-1041
2. Name of Railroad Operating Train #2 Southwestern Railroad Company, Incorporated	2a. Alphabetic Code SW	2b. Railroad Accident/Incident No. HQ-2015-1041

**GENERAL INFORMATION**

1. Name of Railroad or Other Entity Responsible for Track Maintenance Southwestern Railroad Company, Incorporated	1a. Alphabetic Code SW	1b. Railroad Accident/Incident No. HQ-2015-1041
2. U.S. DOT Grade Crossing Identification Number	3. Date of Accident/Incident 4/28/2015	4. Time of Accident/Incident 6:24 AM
5. Type of Accident/Incident Head On Collision		
6. Cars Carrying HAZMAT 0	7. HAZMAT Cars Damaged/Derailed 0	8. Cars Releasing HAZMAT 0
		9. People Evacuated 0
10. Subdivision Carlsbad		
11. Nearest City/Town Chisum, NM	12. Milepost (to nearest tenth) 118.3	13. State Abbr. NM
		14. County CHAVES
15. Temperature (F) 45 °F	16. Visibility Dawn	17. Weather Clear
18. Type of Track Siding		
19. Track Name/Number Chisum Siding	20. FRA Track Class Freight Trains-60, Passenger Trains-80	21. Annual Track Density (gross tons in millions) .99
		22. Time Table Direction West

## OPERATING TRAIN #1

1. Type of Equipment Consist: Freight Train				2. Was Equipment Attended? Yes		3. Train Number/Symbol MCLOCRL127A							
4. Speed (recorded speed, if available) R - Recorded E - Estimated		Code R	5. Trailing Tons (gross excluding power units) 7045		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: _____													
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.)		FXE 4072	1	no			0	2					
(2) Causing (if mechanical, cause reported)		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		9	0	0	0	0	(1) Total in Equipment Consist		27	0	52	0	0
(2) Total Derailed		8	0	0	0	0	(2) Total Derailed		0	0	0	0	0
12. Equipment Damage This Consist 2100000			13. Track, Signal, Way & Structure Damage 286000										
14. Primary Cause Code H702 - Switch improperly lined													
15. Contributing Cause Code H499 - Other main track authority causes (Provide detailed description in narrative)													
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: 9 Mins: 54			Hrs: 9 Mins: 54		
Casualties to:		22. Railroad Employees		23. Train Passengers		24. Others		25. EOT Device?			26. Was EOT Device Properly Armed?		
Fatal		1		0		0		Yes			Yes		
Nonfatal		1		0		0		27. Caboose Occupied by Crew?			No		
28. Latitude 33.000000000				29. Longitude -104.000000000									

## OPERATING TRAIN #2

1. Type of Equipment Consist: Freight Train				2. Was Equipment Attended? No		3. Train Number/Symbol LSWC0021271					
4. Speed (recorded speed, if available) R - Recorded E - Estimated		Code E	5. Trailing Tons (gross excluding power units) 341		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: _____											
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.)		SW 3124	1	no			0	0			
(2) Causing (if mechanical, cause reported)		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		
		b. Manual	c. Remote	d. Manual	e. Remote		a. Freight	b. Pass.	c. Freight	d. Pass.	e. Caboose
(1) Total in Train	3	0	0	0	0	(1) Total in Equipment Consist	1	0	11	0	0
(2) Total Derailed	3	0	0	0	0	(2) Total Derailed	0	0	3	0	0
12. Equipment Damage This Consist 0			13. Track, Signal, Way & Structure Damage 0								
14. Primary Cause Code H702 - Switch improperly lined											
15. Contributing Cause Code H499 - Other main track authority causes (Provide detailed description in narrative)											
Number of Crew Members						Length of Time on Duty					
16. Engineers/Operators		17. Firemen		18. Conductors		19. Brakemen		20. Engineer/Operator		21. Conductor	
0		0		0		0		Hrs: 0 Mins: 0		Hrs: 0 Mins: 0	
Casualties to:		22. Railroad Employees		23. Train Passengers		24. Others		25. EOT Device?		26. Was EOT Device Properly Armed?	
Fatal		0		0		0		N/A		N/A	
Nonfatal		0		0		0		27. Caboose Occupied by Crew?		No	
28. Latitude 33.000000000				29. Longitude -104.000000000							

**CROSSING INFORMATION**

<b>Highway User Involved</b>		<b>Rail Equipment Involved</b>	
1. Type		5. Equipment	
2. Vehicle Speed ( <i>est. mph at impact</i> )	3. Direction ( <i>geographical</i> )	6. Position of Car Unit in Train	
4. Position of Involved Highway User		7. Circumstance	
8a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials?		8b. Was there a hazardous materials release by	
8c. State here the name and quantity of the hazardous material released, if any.			
9. Type of Crossing Warning 1. Gates      4. Wig wags      7. Crossbucks      10. Flagged by crew 2. Cantilever FLS      5. Hwy. traffic signals      8. Stop signs      11. Other ( <i>spec. in narr.</i> ) 3. Standard FLS      6. Audible      9. Watchman      12. None		10. Signaled Crossing Warning	11. Roadway Conditions
12. Location of Warning		13. Crossing Warning Interconnected with Highway Signals	14. Crossing Illuminated by Street Lights or Special Lights
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
19. Driver Passed Standing Highway Vehicle		20. View of Track Obscured by ( <i>primary obstruction</i> )	
Casualties to:	Killed	Injured	21. Driver was
23. Highway-Rail Crossing Users		24. Highway Vehicle Property Damage ( <i>est. dollar damage</i> )	22. Was Driver in the Vehicle?
26. Locomotive Auxiliary Lights?		25. Total Number of Vehicle Occupants ( <i>including driver</i> )	
28. Locomotive Headlight Illuminated?		27. Locomotive Auxiliary Lights Operational?	
		29. Locomotive Audible Warning Sounded?	

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**

Site Photo



**SYNOPSIS**

Synopsis

On April 28, 2015, at 6:24 a.m., MST, a southbound Southwestern Railroad (SW) freight train, MCLOCRL127A, struck a standing freight train (LSWC0021271) head-on in the Chisum Siding, at Milepost 118.3, on the Carlsbad Subdivision near Chisum, New Mexico. The standing train was an unattended local train secured in the Chisum Siding. Eight of the nine locomotives derailed on the striking train and two locomotives and three empty hopper cars derailed on the struck train.

As the striking train approached the accident site just prior to impact, it was operating in track warrant control territory on the main track, at a recorded speed of 42 mph on a slight descending grade and slowed to 35 mph at the time of impact. Track speed on this subdivision is 49 mph. The striking train consisted of nine locomotives in the lead. The struck train was configured with two locomotives in the lead.

The collision resulted in fatal injury to the Engineer and severe injury to the Conductor on the striking train. Both men jumped prior to impact. There was no hazardous material release. Monetary damage to rolling equipment is \$2,100,000 and \$286,000 to track, signal, way, and structure for a total of \$2,386,000.

At the time of the accident, it was dawn, clear sky, with a light wind. The temperature was 45 degrees F.

The cause of this accident was a failure to insure the Chisum siding switch was lined for movement on the main track. FRA concluded the accident occurred because the local train Conductor failed to line the Chisum siding switch back to normal (cause code H702).

There are three contributing causal factors in this event. The first contributing factor was the local train Engineer and Conductor failed to positively confirm the correct switch position (cause code H499) before releasing the track warrant, departing the area, and going off duty. The second contributing factor was the striking train Engineer's blood concentration indicated he was using marijuana while on duty and responsible for the safe and compliant operation of the train. The blood concentration suggests a level of impairment (cause code H101) that would have reduced his performance level and contributed to the severity of the accident. The third contributing factor was the analysis of scientific fatigue information suggested that fatigue was probable for both train crews which supports the investigative results that both train crews had a diminished level of performance due to mental lapses in judgment and situational awareness (cause code H199).

**NARRATIVE**

Narrative

Circumstances Prior to the Accident

The crew of Train MCLOCRL127A (striking train) included a Locomotive Engineer and Conductor. They went on duty at 8:30 p.m., April 27, 2015, at the BNSF Yard in Clovis, NM. This was the home terminal for the striking train crew. They received more than the statutory off duty period prior to reporting for duty.

Their assigned freight train consisted of 9 locomotives, 27 loads and 52 empties of mixed freight. It was 4,395 feet long and weighed 7045 tons. The train was scheduled to travel from Clovis to Carlsbad, NM. The train received an initial terminal train air brake test and departed Clovis at approximately 10:30 p.m., April 27.

Timetable direction on the Carlsbad Subdivision is east to west from Clovis to Carlsbad, NM. The geographical direction runs north to south with the main track in the area of the accident angling northwest to southeast. Reference to direction in this report is geographic in most part with the exception being specific dialog referenced in interviews or specific names identified including track, signal or specific switches. In these references Timetable direction east will equate to geographical direction north and Timetable direction west will indicate geographic direction south.

The striking train crew stopped their train at East Restricted Limit Roswell, NM (Milepost (MP) 105.5), waiting for the local crew to finish industry work west of Roswell and release their track warrant.

The crew of train LSWC0021271 (struck train) included a Locomotive Engineer and Conductor. They first went on duty at 11:00 p.m., April 27, 2015, at the yard office in Roswell where their train was tied down. Clovis was the home terminal for the crew of the struck train; however, they were lodging at a hotel in Roswell the night before the accident occurred. The local train services industries from Clovis to just beyond Dexter.

The local crew received their statutory off duty period prior to reporting for duty. They were called to relieve the regularly assigned local crew who had expired on Hours of Service (HOS) an hour before the relieving local crew went on duty. The local Conductor normally used a company vehicle to do industry and train work for this job. The relief local crew was called to finish servicing DBS Commodities (DBS), MJM Trucking (MJM), and High Pro Feed at Dexter; industries near the Chisum siding.

The Engineer and Conductor obtained a track warrant at the Roswell Depot, by company cell phone, with authority granted between switches from Roswell Restricted limits (MP 110 to MP125). All Dispatcher communication on the Southwestern Railroad (SW) occurs via electronic device (company issued cell phone).

According to an interview with the local Conductor, they obtained their track warrant and paperwork, inspected the train and released the hand brakes. The Conductor said he looked at the train consist and determined that it was not blocked in the right order to switch the industries effectively. So they switched the train, blocking it in the correct order before leaving Roswell.

According to the local Conductor they departed Roswell southbound to DBS, shoved in, pulled five cars and set them on the main track then spotted five or six cars inside the DBS derail. Then the local train proceeded south toward Chisum and elected to pull through Chisum siding on the north end, cut off the cars they just pulled from DBS and take only what cars they needed for MJM and High Pro Feed out the south end of the siding. The Conductor stated he lined both north and south Chisum switches back for the main track and put the derails back on before departing for MJM.

The local crew spotted and pulled MJM and proceeded to High Pro Feed at Dexter, where they spotted the loaded grain cars for unloading; added the pick-up cars to their train, completed an air test and proceeded back to Chisum siding to secure their train and go off duty.

The local Conductor stated he arrived at Chisum siding north switch and waited on his train to arrive. While waiting, the Conductor stated a fuel truck arrived and the driver advised him that he was supposed to fuel the locomotives. Wherein the fuel truck drove down the service road beside the siding track and waited for the train. The Conductor stated he contacted the Engineer and advised him of the fuel truck.

The local train arrived and was stopped by the Conductor in the clear of the North Switch at Chisum siding but blocking the road crossing. The Conductor removed the End Of Train Device (EOT), lined the switch for the siding and was getting ready to remove the derail when he was distracted by an automobile that had pulled up to the road crossing blocked by the train. The Conductor instructed the Engineer to pull ahead to clear the crossing and let the vehicle pass.

After the vehicle passed, the Conductor removed the derail and instructed the Engineer to shove back into the siding before getting into the company vehicle and proceeding south to insure the siding track was clear for the shove. The Conductor stated that he saw another vehicle turning on the crossing as the rear of the train was shoving toward it. The Conductor stated he immediately instructed the Engineer to stop.

After the second vehicle passed, the Conductor instructed the Engineer to shove into the Chisum siding to make a coupling with the cars they had set out in the siding earlier. After making the coupling, the Conductor released the hand brakes on those cars and instructed the Engineer to shove the head end in the clear, behind the derail

According to interview transcript from the local Engineer, he cleared his train up in Chisum siding at approximately 4:30 a.m. He stated the local Conductor began tying hand brakes and advised the Engineer by hand-held radio what he was doing and that they were nearly finished. The Engineer replied that he would be tying hand brakes on the engines.

While securing hand brakes at the rear of the train the Conductor stated that he observed the fuel truck lights next to the locomotives about 10-15 cars to the north. The Conductor advised the Engineer via handheld radio that he installed the EOT device on the rear car and cut in the air.

According to the Engineer's written statement, while he was finishing the Class One air test and air slip paperwork, the Conductor contacted the Engineer and told him he was going to give up the track warrant. The Engineer stated he then voided his track warrant.

The local Conductor stated that the Engineer had contacted the crew of the MCLOCRL127A about a half-hour earlier, before returning from Dexter and advised them that the local train would be clearing up in the Chisum siding soon.

The local Conductor stated he contacted the Dispatcher and gave up the track warrant before returning to the head end of the train. According to a transcript of the joint NTSB and FRA interview the local Conductor stated: "And in my head I thought I lined everything back. Him shoving in, maybe I thought in my head that he had lined back, which doesn't happen very often, but it had. We had made a comment before to make sure -- we got on engines that were too close to the derail. So I was -- he was making sure we got past the derail or I had thought in my head when I lined earlier in the day, I had that in my head that that's what I had done. I'm not sure. I got up, gave up the warrant, drove up a few cars, waited for [name of engineer]."

According to a transcript of the joint NTSB and FRA interview, the local Engineer stated: "I walked back to the nose of the trailing locomotive, grabbed my grip, and walked over to the dirt road adjacent the tracks, where I waited for Conductor to pick me up. When I got in the vehicle, I again asked if the authority had been given up, and he said it had. I put my seatbelt on and we departed the area. Moments after departing, I asked [name of conductor] if he had contacted the westbound crew, and offered to do that for him. I called Westbound [name of conductor (ph.)] and let him know that we were in the clear and the track was his. [Name of local conductor] never confirmed with me that he had realigned the east switch for the main line or that he had put up the derail."

When the local train crew secured their train after finishing work, the train was made up with two locomotives, one load and 11 empties of mixed freight. It was approximately 800 feet long and weighed approximately 341 tons.

After departing Chisum siding in a company vehicle the local crew completed their HOS paperwork which stated they went off duty at 6:00 a.m., April 28, 2015 in Roswell.

The Accident

The striking train lead locomotive is FXE 4072, which departed Clovis with track warrant authority from Restricted Limit Clovis (MP 0.5) to Restricted Limit Roswell (MP105.5).

FXE 4072 was being operated at 42 mph approaching the accident area traveling geographical South. The train crew's view of the main track at Chisum siding was unobstructed. The main track approaching this location is tangent for more than two miles with a slight descending grade to the Chisum siding switch.

Following is a factual time line of event reconstruction according to dispatcher tape recording time stamps, track warrant "OK" times, locomotive event recorder analysis from both trains and interviews with the local train crewmembers:

04:24 a.m. April 28, 2015, According to analysis of the locomotive event recorder, FXE 4072 stopped at MP 102.82 just inside of Roswell Restricted limit MP 105.5, the limit of their track authority.

Note: The FXE 4072 crew waited for the Roswell local crew to finish industry work and clear up at Chisum siding so they could pass their location and proceed to Carlsbad. The striking train was stopped 15-plus miles from point of impact (POI).

04:40 a.m.: The local train Conductor (SW3124) contacted the American Rail Dispatching Center (ARDC) dispatcher via cell phone and released their track warrant authority from MP 110 to MP 125, verbally confirming the Chisum siding switch was lined and locked for the main track.

Note: According to a transcript of the joint NTSB and FRA interview the local Engineer stated: After the local Conductor released the track warrant the local Engineer contacted the FXE 4072 Conductor and advised him they had cleared up in Chisum siding sometime between 04:40 and 04:50 a.m..

04:48:35 a.m. - According to the locomotive event recorder, the Engineer of the FXE 4072 released the train's automatic brake while stopped at MP 102.82.

Note: The FXE 4072 Engineer was stopped for 24 minutes before he released the train's automatic brake and remained stationary.

04:51 a.m.: The ARDC dispatcher contacted the FXE 4072 Conductor via cell phone and advised him that the Roswell local had cleared up at Chisum; wherein, the FXE 4072 Conductor "rolled up" his track authority behind the train from Clovis to MP 101.

Note: The track warrant "roll up" releases the main track authority behind the FXE 4072 for movement of other trains, wherein the ARDC dispatcher voided the previous track warrant and issued a new Warrant from MP 101 to East Restricted Limit Artesia, (MP 142.3) which is approximately 24 miles west of the Chisum siding at MP 118.2.

05:30:15 a.m.: According to the FXE 4072 locomotive event recorder, the Engineer initiated train movement southward, after 41 minutes, 19 seconds of being stopped at MP 102.82 with the automatic brake released.

Note: According to event recorder analysis, FXE 4072 stopped at this location for 1-hour and 5 minutes total waiting on the local crew to clear the main track.

06:22:43 a.m.: FXE 4072 was traveling at 42 mph, throttle position three, 1841 feet from POI.

06:22:44 a.m.: (1-second) FXE 4072, train operator reduced to throttle position two, 42 mph.

06:22:46 a.m.: (2 seconds) FXE 4072 at Vista Largo Road crossing train horn board, train operator reduced to throttle position one, 42 mph, 1657 feet from POI.

06:22:47 a.m.: (3 seconds) FXE 4072, train operator reduced throttle to idle, 42 mph, 1596 feet from POI.

06:22:54 a.m.: (11 seconds) FXE 4072 initiates train horn sequence at MP 118.2 for Vista Largo Road crossing (DOT # 019920K, MP 118.26), 1168 feet from POI.

06:23:02 a.m.: (19 seconds) FXE 4072 throttle position idle, 41 mph approximately 255 feet from Vista Largo Road crossing (Chisum siding switch just beyond road crossing); FXE 4072 initiated an emergency brake application (from engineer control stand), 681 feet from POI.

06:23:15 a.m.: Train collision at MP 118.33, 35 mph in Chisum siding.

06:23:20 a.m.: FXE 4072 travels 193 feet beyond POI as SW 3124 locomotive consist rebounds backward.

06:26 a.m.: Emergency 911 call occurred. Roswell Police were first on scene and discovered severely injured Conductor and the deceased Engineer. First responders at the scene were: Chaves County Sheriff's Deputies, Roswell Fire Department Firefighters, Midway Fire Department Firefighters, Dexter Fire Department Firefighters, and Superior Ambulance Paramedics. Firemen shut down running locomotives by emergency fuel cutoff. Police and firemen searched both train's locomotive consists for more occupants.

06:28 a.m.: According to police reports the Roswell Police found the severely injured Conductor approximately 15 feet north of Vista Largo Road crossing on the Engineer (west) side of the train, in the right-of-way between State Road (SR) 2 and the Main Track, initially attended by Good Samaritan's. Paramedics triaged the injured Conductor and transported him to Roswell. He was diagnosed with severe injuries and flown to University Medical Center in Lubbock, Texas for further treatment.

06:30 a.m.: The deceased Engineer was also examined by two New Mexico State Police Officers. His body was located approximately 220 feet south of the Vista Largo Road crossing, beside the left hand ladder to the crew cab of BNSF locomotive 1063 (the fifth locomotive in the train consist). The Engineer's body was partially covered with track ballast. He was found with jeans, T-shirt, socks, no safety boots and belt undone. His safety boots were located in the FXE 4072 as confirmed by law enforcement.

The Federal Bureau of Investigation (FBI) elected to investigate this accident after being contacted by the Roswell City Police (LEA) and advised that they found a blue and clear plastic container containing Zig-Zag rolling paper with multiple separate baggies containing a green leafy substance that resembled marijuana, and two drug paraphernalia pipes. These items were located within FXE 4072's crew compartment. The green leafy substance was field tested as positive for marijuana by the Law Enforcement Agency (LEA). The FBI asked the New Mexico State Police (NMSP) to take over the investigation. The marijuana and other evidence found at the scene was confiscated by the NMSP and entered in their evidence vault in Roswell. Three cell phones were found at the scene by LEA and railroad management and turned over to the NTSB.

According to an SW railroad manager's written statement he was the first railroad manager contacted by the Roswell Police dispatcher and advised of the head-on train collision. He departed Carlsbad immediately and arrived at the accident scene at approximately 7:55 a.m. The SW manager did not know if the local train crew (struck train) was working at the time the accident was reported to him.

While driving to the scene the manager contacted the local train Conductor by company cell phone. He found out the local Conductor was off duty but heading back to the scene. According to the SW manager's written statement, he stated the local Conductor repeatedly said on the phone: "that he 'expletive deleted up,' I got us in the clear and I was going to line the switch back, but then there was a fuel truck there and I went to talk to him, and I didn't go back and line the switch."

After arriving at the scene, the SW manager was advised about and shown the location of the deceased Engineer. Then the manager surveyed the accident site and ordered locomotive fuel spill removal and other derailment clean-up coordination and contacted other railroad managers for assistance in the investigation.

The SW manager stated he observed the Chisum siding switch lined for movement into the siding and locked. He took photographs of the switch stand and conferred with the VP of Operations Western Group, the parent company of the railroad, about the local train crew's duty time and position of the siding switch. The Engineer and Conductor of the struck train went off duty prior to the accident at 6:00 a.m. and were not subject to Federal Railroad Administration Subpart C post-accident testing or FRA Subpart D reasonable cause testing.

The VP of Operations conferred with the Western Group Director Rules and Compliance manager and decided to order the local train crew back on duty for a company drug test. The crew was called back to duty at 1:00 p.m. on April 28 for testing. They were tested at 1:50 p.m.

There was no hazardous materials involvement in this accident except for locomotive diesel fuel leakage resulting from the collision. Two Oil and Recovery trucks were contacted to clean up the spilled oil and diesel fuel on the ground. There was no fire.

Analysis: A review of Locomotive inspection records revealed that the FXE 4072 Engineer failed to do a daily inspection of the train's locomotive consist.

Conclusion: This is a violation of Title 49 Code of Federal Regulations (CFR) Section 229.21 (b)(2): FAILURE TO MAKE WRITTEN REPORT OF MU DAILY INSPECTION: Each MU locomotive in use shall be inspected at least once during each calendar day and a written report of the inspection shall be made. A recommendation for violation was filed with FRA.

Conclusion: FRA's Inspector-in-Charge (IIC) was unable to obtain any direct information during an interview with the Conductor of the striking train. The effort to interview the Conductor occurred 30 days after the accident while he was still recovering from his injuries. The Conductor stated he sustained head trauma in the accident and could not remember anything from that tour of duty.

Fatigue Analysis: FRA obtained fatigue related information for the 10-calendar day period preceding this accident, including the on-duty/off-duty cycles for the Engineer and Conductor on both trains.

Conclusion: Analysis of the fatigue information revealed that fatigue was probable for both train crews. All four employees may have been working at a diminished level of effectiveness due to mental and/or physical attributes associated with fatigue, which may have contributed to the cause of the accident.

Analysis: This accident met the criteria for 49 CFR Section 219.201, Subpart C, Post Accident Toxicological testing for the striking train's Engineer and Conductor and the train dispatcher for which all three employees were tested under Federal authority. The Engineer and Conductor of the struck train were tested under company reasonable cause authority.

Conclusion: FRA Post-Accident Forensic Toxicology Result Report for the Engineer of the striking train indicated toxicological testing results of the urine and blood revealed concentrations of marijuana which suggested he was impaired, perhaps significantly, at the time of the accident. The blood concentration clearly indicated the Engineer was using marijuana while on duty, within a few hours of the accident, and while responsible for the operation of the train. Blood concentration of parent THC (delta-9-tetrahydrocannabinol) was 36.3 ng/ml; the carboxyl metabolite (delta-9-tetrahydrocannabinol-9-carboxylic acid, or THCA) was 149.4 ng/ml. His urine concentration of THCA was 1,291 ng/ml.

FRA Post-Accident Forensic Toxicology Result Report for the Conductor of the striking train indicated toxicological test results from blood specimens collected 33 hours after the accident was reported to FRA as positive for codeine (29.9 ng/ml). Urine was not collected from the surviving Conductor. After documenting and making all reasonable effort to contact the Conductor, neither the Medical Review Officer (MRO) nor the railroad Designated Employer Representative (DER) was able to make contact with the employee to discuss the confirmed positive test result from the laboratory.

Note: The standard regulatory procedure is for the MRO to contact an employee with a positive laboratory result in order to determine if the employee has a verified prescription or had received any medications during his transportation to and while receiving treatment at the medical facility. Since there was no contact made, the MRO verified the test result as a positive.

Conclusion: The Engineer and Conductor of the standing train went off duty prior to the time of the accident. They were not subject to Federal Railroad Administration Subpart C post-accident testing but were returned to duty for company testing which determined negative results.

Conclusion: FRA Post-Accident Forensic Toxicology Result Report indicated the train dispatcher employed by American Rail Dispatching Center had a negative test result.

Analysis: LEA found a blue and clear plastic container containing Zig-Zag rolling paper with multiple separate baggies containing a green leafy substance that resembled marijuana, and two drug paraphernalia pipes. These items were located within Locomotive FXE 4072 crew compartment. The green leafy substance was field tested as positive for marijuana by LEA.

Conclusion: This is a violation of 49 CFR Section 219.101 (a)(1). NO EMPLOYEE MAY USE OR POSSESS ALCOHOL OR ANY CONTROLLED SUBSTANCE WHILE ASSIGNED BY A RAILROAD TO PERFORM COVERED SERVICE. Employee violates prohibitions: On April 28, 2015, SW experienced a head-on collision with fatality at Chisum siding near Dexter. During the investigation, it was determined that a member of the crew had marijuana in his possession. A recommendation for violation was filed with FRA.

Analysis: SW management failed to have forensic toxicology tests conducted on the Conductor of the FXE 4072 for 33 hours after the accident occurred.

Conclusion: This is in violation of 49 CFR Section 219.203 (b)(1): DELAY IN OBTAINING SPECIMENS DUE TO FAILURE TO MAKE EVERY REASONABLE EFFORT; Post-Accident Toxicological Test Results; Re: Southwestern Railroad (SW) at Roswell on April 28, 2015. A review of the paperwork and the laboratory trouble report indicates the following paperwork and/or collection problems: Specimens collected more than 4 hours after accident for Sample Set ID 319949. A SW manager was instructed to meet the injured employee at the hospital in Lubbock, TX and was half a day late in departing. A recommendation for violation was filed with FRA.

Analysis: SW management failed to collect and handle toxicology specimen of the striking train Conductor.

Conclusion: This is a violation of 49 CFR Section 219.205(a): FAILURE TO OBSERVE REQUIREMENTS WITH RESPECT TO SPECIMEN COLLECTION, MARKING AND HANDLING; Post-Accident Toxicological Test Results; Re: Southwestern Railroad (SW) at Roswell on April 28, 2015. A review of the paperwork and the laboratory trouble report indicates the following paperwork and/or collection problems: SW managers failed to collect and handle Specimen in accordance with Federal regulations. Title 49 CFR Section 219.205(a) states: that urine and blood specimens must be obtained, marked, preserved, handled, and made available to FRA consistent with the requirements of this subpart, and the technical specifications set forth in Appendix C. A recommendation for violation was filed with FRA.

Analysis: SW management failed to provide properly prepared forms with specimens.

Conclusion: This is a violation of 49 CFR Section 219.205(b): FAILURE TO PROVIDE PROPERLY PREPARED FORMS WITH SPECIMENS; Post-Accident Toxicological Test Results; Re: Southwestern Railroad (SW) at Roswell on April 28, 2015. A review of the paperwork and the laboratory trouble report indicates the following paperwork and/or collection problems: Section 219.205 Specimen collection and handling. Title 49 CFR Section 219.205(a), accordingly the railroad representative must complete the information required by Form FRA 6180.73 (revised) for shipping with the specimens. Each employee subject to testing must cooperate in completion of the required information on Form FRA F 6180.74 (revised) for inclusion in the shipping kit and processing of the specimens. A recommendation for violation was filed with FRA.

Analysis: SW management failed to promptly and properly forward specimens.

Conclusion: This is a violation of 49 CFR Section 219.205(d): FAILURE TO PROMPTLY OR PROPERLY FORWARD SPECIMENS; Post-Accident Toxicological Test Results; Re: Southwestern Railroad (SW) at Roswell on April 28, 2015. A review of the paperwork and the laboratory trouble report indicates the following paperwork and/or collection problems: 219.205(d) Specimen Collection and Handling; states that if a courier pickup is not available at the medical facility where the specimens are collected or for any other reason prompt transfer by the medical facility cannot be assured, the railroad must promptly transport the sealed shipping kit holding the specimens to the most expeditious point of shipment via air express, air freight or equivalent means. The railroad must maintain and document secure chain of custody of the test kit from release by the medical facility to delivery for transportation, as described in Appendix C. SW railroad failed to use due diligence to comply with this requirement. A recommendation for violation was filed with FRA.

Analysis: Train FXE 4072 stopped at MP 102.82 approximately 15+ miles from the POI for this accident waiting on the local train crew to finish industry work in the Chisum siding area. According to event recorder data analysis the train stopped at 04:24 after the operator applied graduated brake pipe reductions to 20 pounds. FXE 4072 remained stationary for 24 minutes with the brake applied when the operator released the automatic brake while remaining for another 41 minutes, before moving the train.

Conclusion: The release of the train brakes while stationary is not in compliance with SW's Air Brake and Train Handling (ABTH) rules. The Southwestern uses BNSF rules.

Conclusion: The release of the train brakes while stationary is not in compliance with SW's Air Brake and Train Handling (ABTH) rules. The Southwestern uses BNSF rules. The train operator's action is a violation of SW's General Code of Operating Rules (GCOR) Rule 103.6.4: Stopping, Level or Descending Grade with Dynamic Brakes Available, Slack Bunched ... make a final brake pipe reduction and allow the locomotive brakes to apply.

Note: FXE 4072 stopped at MP 102.82 for 1-hour and 5 minutes. Industry standard practice for a train stop would have followed the rule by applying a 20 pound brake pipe reduction and leave the train brakes set until departing. The FXE 4072 released the automatic brake after being stopped for 24 minutes. The train remained stationary 41 minutes with the brakes released before moving the train.

Analysis: Vista Largo Road crossing is located at MP 118.26. The train operator initiated train horn sequence approximately 317 feet before the crossing. The train operator waited seven seconds after passing the Vista Largo Road crossing train horn board before sounding the train horn.

Conclusion: SW General Code of Operating Rule 5.8.2 (7) Sounding Whistle states: When approaching public crossings at grade with the engine in front, sound signal as follows: ...At speeds of 45 mph or less, start signal at least 15 seconds, but not more than 20 seconds, before entering the crossing. Title 49 CFR Section 222.21 (b)(2) states... the locomotive horn shall begin to be sounded at least 15 seconds, but no more than 20 seconds, before the locomotive enters the crossing. The Engineer initiated train horn sounding less than 1-second before placing the train into emergency brake application.

Analysis: According to a review of the NTSB and FRA interview transcript with the local train Engineer and Conductor and review of the ARDC dispatcher recordings; the Conductor released the track warrant while he was at the rear of the train before he drove to the head end to pick up the Engineer. The local Engineer stated he voided his track warrant after receiving a radio call from the Conductor notifying the Engineer he was releasing the Warrant.

Analysis: The local train Conductor failed to line the Chisum siding switch back to normal and confirm the correct switch position with the Engineer before releasing the track warrant, departing the location and going off duty.

Conclusion: This is a violation of three SW GCORs:

Rule 14.7: Reporting Clear of Limits... In addition, a train using a hand-operated switch to clear the main track must comply with requirements outlined in Rule 8.3 (Main Track Switches) before reporting clear of the limits.

Rule 8.3: Main Track Switches... The normal position of a main track switch is for main track movement, and it must be lined and locked in that position. Before leaving the location where a hand-operated main track switch was operated: Crew members must confirm the position of the switch with each other.

Rule 8.2: Position of Switches: The employee operating the switch or derail is responsible for the position of the switch or derails in use... When possible, crew members on the engine must see that the switches and derails near the engine are properly lined.

Conclusion: The local train Conductor failed to line the Chisum siding switch back to normal and confirm the correct switch position with the Engineer before releasing the track warrant, departing the location and going off duty.

Conclusion: This is a violation of Federal regulations; Title 49 CFR Section 218.103 (b)(3): HAND-OPERATED SWITCHES, INCLUDING CROSSOVER SWITCHES: Employee failed responsibility for the position of the switch in use. A recommendation for violation was filed with FRA.

Conclusion: This is a violation of Federal regulations; Title 49 CFR Section 218.105 (c)(1): ADDITIONAL OPERATIONAL REQUIREMENTS FOR HAND-OPERATED MAIN TRACK SWITCHES: Job briefing-failure of one or more crewmembers to have a verbal communication to confirm switch position. A recommendation for violation was filed with FRA.

Analysis: According to a review of the joint NTSB and FRA interview transcript, the local Engineer stated: "...I put my seatbelt on and we departed the area. Moments after departing, I asked [name of conductor] if he had contacted the westbound crew (geographic south), and offered to do that for him. I called westbound [name of conductor on striking train (ph.)] and let him know that we were in the clear and the track was his..."

Conclusion: The local Engineer called the Conductor of the striking train and advised him "that we were in the clear and the track was his." The local Engineer's phone call gave the crew of the FXE 4072 a presumption that the Chisum siding switch was lined for the main track when in fact was not.

Analysis: The NTSB and FRA conducted a sight distance test to determine preview and visibility of the switch target at MP 118.26, the east switch at Chisum siding. The NTSB, FRA, New Mexico Public Regulatory Commission, an SW manager and an SW train crew participated in the test.

A reenactment was conducted May 1, 2015, at approximately the same time of day and weather as the time of the accident on the SW's Carlsbad Division between MP 116.0 and MP 119.43. Sunrise on the day of the test was at 6:11 a.m. The test was conducted as close to 6:24 a.m. as possible.

For safety consideration, the switch target was moved from its normal location on the switch stand pole indicating lined for the Chisum siding to the position on the switch stand pole with the switch actually lined for normal movement on the main track. The Test run began at about MP 117.08 operating on the main track proceeding geographically southward. The Engineer and Conductor were asked to notify the on-board observers when the switch target was clearly visible.

Upon sight of the switch target, two methods of marking the sighting location were used: (1) the Engineer sounded the horn to mark the event recorder data and (2) a "flour bag" marker was simultaneously "dropped" outside the locomotive window to trackside. Measurements were taken, the flour cleaned up, and the test was run a second time.

Conclusion: The sight distance from the "drop" to the switch target was determined to be 2,239 feet for a normal view of the Chisum siding switch targets indicating lined for the siding. According to analysis of the event recorder data on the FXE 4072, beginning approximately 2200 feet from the POI, the train was traveling at 42 mph in throttle position three. The train operator reduced throttle from position three to two, to one, to idle, 1-second apart while maintaining 42 mph on a slightly declining grade. The train continued at 42 mph in throttle idle for 15 more seconds approaching the Chisum siding switch without either crewmember recognizing the switch target indicated the switch was lined for movement into the siding. FXE 4072 slowed to 41 mph as it approached the Vista Largo Road crossing. The train operator began initiating train horn sounding within the same second he initiated emergency brake application at the Vista Largo Road crossing. The siding switch is just beyond Vista Largo Road.

Overall Conclusion:

The weather on the morning of the collision was daylight, clear sky, northeast light wind with a temperature of 45 degrees F. Sunrise was at 5:54 a.m. The collision occurred at 6:24 a.m., 30 minutes after sunrise. At the accident location the Sun rises above the celestial equator in the spring in the northeast, follows a long, high arc north of the celestial equator, and sets in the northwest. The geographic direction of the main track approaching the Chisum siding is northwest to southeast. The train was traveling southeast with the train operator seated on the west side so it is reasonable to assume the sunrise would not have been a distractor to the vision of the Engineer or Conductor. The effect of the sunrise was examined and confirmed by the SW train crew and investigating participants during the sight distance re-enactment.

The Conductor jumped from the train and was found approximately 15 feet north of the Vista Largo Road crossing on the west side of the main track (engineer's side of the locomotive cab), severely injured. The Conductor's location is in the same vicinity where the emergency brake application occurred. The deceased Engineer was found approximately 220 feet south of the Conductor beside the fifth locomotive in the consist, without his safety boots on and his leather belt undone. The IIC could not clearly establish who was operating FXE 4072 at the time of the accident.

The train event recorder data revealed that the operator's train handling actions leading to the collision did not comply with industry standard for Rule and Regulatory compliance suggesting that the train operator handled the train improperly.

The first non-standard action occurred when the train operator stopped at MP 102.82 for 1-hour and 5 minutes. After stopping with the brake set for 24 minutes the operator released the automatic brake for 41 minutes, before moving the train. Industry standard for a train stop would have followed GCOR Rule 103.6.4, applied brake pipe reduction and left the train brakes applied until departing. The train operator failed to follow this standard.

The second non-standard train handling action occurred when the train operator failed to sound the train horn within a reasonable standard of GCOR Rule 5.8.2 or Title 49 CFR Section 222.21 when the train approached the Vista Largo Road crossing. The event recorder data revealed the train operator took no action after passing the train horn

CFR Section 222.21 when the train approached the Vista Largo Road crossing. The event recorder data revealed the train operator took no action after passing the train horn sign for the Vista Largo Road crossing which was 1657 feet from the POI. According to event recorder analysis the train operator began to sound the train horn 317 feet from the crossing and initiated an emergency brake application within the same second just 255 feet from the crossing.

The train's approach to the Chisum siding is on slightly descending tangent track. The NTSB/FRA switch target sight distance test determined a reasonable sight distance to the switch target to be 2,239 feet. The train operator initiated emergency brake application (from engineer control stand) just 681 feet from the POI. This location was determined to be approximately 255 feet northwest of the Vista Largo Road crossing pavement with the siding switch stand just beyond the Vista Largo Road crossing pavement.

#### Probable Cause & Contributing Factors

The cause of this accident was a failure to insure the Chisum siding switch was lined for movement on the main track. FRA concluded the accident occurred because the local train Conductor failed to line the Chisum siding switch back to normal (cause code H702).

There are three contributing causal factors in this event. The first contributing factor was the local train Engineer and Conductor failed to positively confirm the correct switch position (cause code H499) before releasing the track warrant, departing the area, and going off duty. The second contributing factor was the striking train Engineer's blood concentration indicated he was using marijuana while on duty and responsible for the safe and compliant operation of the train. The blood concentration suggests a level of impairment (cause code H101) that would have reduced his performance level and contributed to the severity of the accident. The third contributing factor was the analysis of scientific fatigue information suggested that fatigue was probable for both train crews which supports the investigative results that both train crews had a diminished level of performance due to mental lapses in judgment and situational awareness (cause code H199).