

**SUMMARY FOR FE-14-06**  
**SELECTED AND POSSIBLE CONTRIBUTING FACTORS**

**SELECTED FACTORS**

**Railroad:** Alton and Southern Railway Company (ALS)  
**Location:** East St. Louis, Illinois  
**Region:** 4

**Month:** September  
**Date:** Sept. 10, 2006  
**Time:** 11:31 p.m., CST

**Data for Fatally Injured Employee(s)**

Conductor  
44 years old  
8 months of service  
Last rules training: April 8, 2006  
Last safety training: March 1, 2006  
Last physical: Feb. 10, 2006

**Data for All Employees (Craft, Positions, Activity)**

**Craft:** Transportation and Engine

**Positions:**

**Yard Job YAS271**

Conductor  
Locomotive Engineer

Bowl Yard Master  
Railroad Supervisor

**Activity**

Switching

**EVENT**

A Conductor was fatally injured when crushed  
between two locomotives during a switching operation.

## **SUMMARY FOR FE-14-06 CONTINUED**

### **POSSIBLE CONTRIBUTING FACTORS**

#### **PCF No. 1**

The Conductor failed to keep a careful lookout in both directions for trains, engines, or cars on adjacent tracks, and for close clearances while he was riding the step of the locomotive.

#### **PCF No. 2**

The Locomotive Engineer and Conductor failed to comply, on several occasions, with railroad operating rules requiring railroad employees to immediately stop work and hold job briefings when changes occurred to the work plan or conditions changed.

#### **PCF No. 3**

Prior the fatal incident, the Conductor failed to provide the Engineer with car lengths or distance to travel.

#### **PCF No. 4**

The Locomotive Engineer failed to stop movement when the Conductor disappeared from sight while riding the step of the locomotive, just prior to the fatal incident.

#### **PCF No. 5**

In non-compliance with railroad operating rules, the crew members failed to communicate which moves would be made by radio communication, rather than hand signals. While using the radio, the Engineer also accepted hand signals, also in non-compliance. Throughout most of the switching operation, the Conductor used a combination of radio communication and hand signals. If the Conductor had been using radio communication, rather than hand signals, while he was riding the step of the locomotive, he may have been able to avoid being crushed by the two locomotives.

#### **PCF No. 6**

The crew members failed to comply with railroad operating rules prohibiting them from leaving cars or engines standing where they would foul equipment on adjacent tracks.

**SUMMARY FOR FE-14-06 CONTINUED****POSSIBLE CONTRIBUTING FACTORS CONTINUED****PCF No. 7**

When the Locomotive Engineer discovered the Conductor lying on the ground between the two locomotives, she failed to initiate an emergency radio transmission preceded by the word “emergency,” repeated three times, as required by Federal regulations and railroad operating rules. This resulted in a delay in summoning help for the Conductor which possibly could have saved his life.

**REPORT:** FE-14-2006

**RAILROAD:** Alton and Southern Railway Company (ALS)

**LOCATION:** East St. Louis, Illinois

**DATE & TIME:** Sept. 10, 2006; 11:31 p.m., CST

**EVENT<sup>1</sup>:** A Conductor was fatally injured when crushed between two locomotives during a switching operation.

**EMPLOYEE:**

Craft:	Transportation and Engine
Occupation:	Conductor
Age:	44 years
Length Of Service:	8 months
Last Rules Training:	April 8, 2006
Last Safety Training:	March 1, 2006
Last Physical:	Feb. 10, 2006

**CIRCUMSTANCES PRIOR TO THE ACCIDENT**

On Sept. 10, 2006, a Conductor and Locomotive Engineer reported for work at the ALS General Office Building in East St. Louis, Illinois, on Yard Job YAS271. The Conductor had been ordered to report for duty at 4:04 p.m., and the Engineer had been ordered to report at 4 p.m. The Conductor was called off the Conductors' extra board and the Engineer was called off the Engineers' extra board. Prior to reporting, the Conductor had been off duty for the required statutory off-duty period of eight hours. The Engineer received more than the statutory off-duty period prior to reporting. The duties of this yard job assignment were to move locomotives around within the yard and line them up for outbound trains. Both employees had experience working this yard job assignment, but not together. The Conductor last worked this job on July 2, 2006, and the Engineer last worked it on Sept. 3, 2006. The Conductor and Engineer worked together for the first time on Sept. 10, 2006 on a yard job assignment.

Prior to the incident, they had worked in various locations throughout the East St. Louis Gateway Yard, moving locomotives to appointed locations. All work had been performed without incident. Late into their shift, they were instructed to assemble a 3-locomotive consist from the roundhouse tracks for outbound Train Symbol MASNL10. Once the locomotives were assembled on Roundhouse Track "B," they were lined up from west to east with Locomotive No. UP 9456

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<sup>1</sup> "Event" is defined as "occurrence that immediately precedes and directly results in the fatality." Possible contributing factors are identified in the following report and attached summary.

in the lead, followed by Locomotive No. UP 9413 and then Locomotive No. UP 9379. As the Engineer inspected Locomotive No. UP 9456, she observed that it was not lead-qualified, as it had no working radio or head-end monitor. She then conducted a job briefing with the Conductor to discuss putting Locomotive No. UP 9379 in the lead of the consist once they had left the roundhouse so there would be a lead-qualified locomotive on the head end for the outbound train. The plan was to pull the Yard Job YAS271 locomotive consist onto the “B” Way Track, set Locomotive No. UP 9379 over to the “D” Yard Lead, and then put Locomotives Nos. UP 9456 and UP 9413 back onto the Roundhouse Lead. Once that move was completed, the Engineer would then walk over and get on Locomotive No. UP 9379 on the “D” Yard Lead and move it over to the Roundhouse Lead, making it the lead locomotive of the consist.

The Engineer then conducted another briefing, this time with the Yard Master, using the radio to advise him of the move they needed to make. According to the Engineer, the Conductor was present when this radio conversation took place and seemed to understand the plan, and had no questions. As they began to depart the Roundhouse B Track, the Engineer observed the Conductor pull the pin on the wrong locomotive. She then left the locomotive cab and went down on the ground to conduct another job briefing with the Conductor regarding their planned move. Once again, the Conductor indicated his understanding, and the Engineer returned to the locomotive cab. No other job briefings were conducted prior to the incident.

The crew members began their movement off the Roundhouse Lead, moving westbound, with the Engineer operating from lead Locomotive No. UP 9456 with the short end forward. Once the locomotive consist was out on the “B” Way Track, the Conductor lined the Roundhouse Lead Switch and gave both a hand signal and radio instructions for the Engineer to move the locomotive consist eastward onto the “D” Yard Lead. Once the consist was on the “D” Yard Lead, the Conductor stopped the movement with a hand signal and cut Locomotive No. UP 9379 away from the consist, leaving it on the “D” Yard Lead. The Engineer then used her hand-held radio to instruct the Conductor to put a hand brake on the locomotive they were leaving. He acknowledged her communication, applied the hand brake, then used a hand signal, instructing her to move westbound, which she did. The Conductor, using both a hand signal and his hand-held radio, stopped the movement west of the Roundhouse Lead Switch and lined it for movement onto the Roundhouse Lead. Then, using both a hand signal and his hand-held radio, he instructed the Engineer to move eastbound onto the lead. The Engineer began the eastbound movement, but the Conductor stopped her, using a hand signal, when he realized that Locomotive No. UP 9379 would not clear the movement of the two remaining locomotives onto the Roundhouse Lead. The Conductor then gave a hand signal to the Engineer, instructing her to move westbound. He stopped her with another hand signal when the locomotives were west of the Roundhouse Lead Switch. He lined the switch and then, using both a hand signal and his hand-held radio, he signaled the Engineer to bring the locomotive consist back eastbound onto the “D” Yard Lead. He coupled the locomotives back into Locomotive No. UP 9379 and shoved it eastward. He stopped the movement using a hand signal, and once again, cut away from Locomotive No. UP 9379 and, using both a hand signal and his hand-held radio, instructed the Engineer to proceed west. Again, using both a hand signal and his hand-held radio, he stopped the movement west of the Roundhouse Lead Switch and lined the switch for movement onto the Roundhouse Lead.

The area where this move was being made consisted of two sets of parallel railroad tracks extending east and west, with the general office building on the north side of the tracks and the roundhouse facility on the south side of the tracks. The north track is referred to as the "A" Way Track. The south track is referred to as the "B" Way Track up to the Roundhouse Lead Switch located in front of the general office building. This switch, when lined in the normal position, leads to the "D" Yard Lead and when lined in reverse, extends southward to the Roundhouse Lead. Roundhouse Tracks "A" and "B" are located on the sound end of the lead giving access to and from the roundhouse. The area where the incident occurred is very well-lighted, and the tracks are basically flat and level with no appreciable grade. There is an overhead walkway bridge located just east of the Roundhouse Lead Switch, which extends over the "A" Way Track and the "D" Yard Lead Track.

The weather was clear, and the temperature was approximately 73° F.

### **THE ACCIDENT**

At approximately 11:30 p.m., the Conductor boarded Locomotive No. UP 9413 and positioned himself on the locomotive step on the Engineer's side at the leading end of the shoving move to be made. He then gave the Engineer a hand signal to back eastward onto the Roundhouse Lead Track, which she did. She started moving the locomotive consist eastward, never exceeding 3 mph, onto the Roundhouse Lead. After moving approximately one-half an engine length, she lost sight of the Conductor, at which time she stopped the movement, using the locomotive's independent brake.

After stopping the movement, the Engineer got off the locomotive consist and walked around it looking for the Conductor. She observed that the leading locomotive of their shoving move on the Roundhouse Lead Track had struck Locomotive No. UP 9379, located on the "D" Yard Lead. When she was unable to locate the Conductor, using her hand-held radio, she requested the Bowl Yard Master to have a Train Master come to her location. The Engineer then walked through the cabs of each of the three locomotives and was unable to locate the Conductor. She got back down on the ground and walked between Locomotive No. UP 9413, which was on the Roundhouse Lead, and Locomotive No. UP 9379, which was adjacent to Locomotive No. UP 9413 on the "D" Yard Lead, and discovered the Conductor lying on the ground between them. Upon discovering him on the ground, she immediately ran into the general office building and notified the Bowl Yard Master that the Conductor was down and that an ambulance and Train Master were needed immediately. After making contact with the Bowl Yard Master, the Engineer returned outside, but was kept away from the area where the Conductor lay by fellow employees who had arrived at the accident site.

Emergency assistance was summoned from via 911, and a Railroad Supervisor and fellow employees quickly arrived on the scene and discovered the Conductor was unconscious. Upon arrival of the ambulance and medical personnel, the Conductor was transported to the Kenneth Hall Regional Hospital in East St. Louis, Illinois, where he was pronounced dead at 12:51 a.m. on Sept. 11, 2006.

## **POST-ACCIDENT INVESTIGATION**

Within hours of the incident, FRA investigators were on-site and took photos of the area and the equipment while it was still in place. In an interview, ALS officials stated that when the Conductor set Locomotive No. UP 9379 on the “D” Yard Lead, he left it foul of the Roundhouse Lead Track. Then, as he controlled the movement of Locomotives Nos. UP 9413 and UP 9456 back onto the Roundhouse Lead, he failed to stop short of the obstruction caused by Locomotive No. UP 9379, allowing Locomotive No. UP 9413 to strike it and crush him between the two locomotives, resulting in him being knocked to the ground. The ALS determined, through the review of a yard camera used by clerks for review of train consists, that once Locomotive No. UP 9379 was shoved east on the “D” Yard Lead and the hand brake was applied, it did not move. The ALS investigators conducted interviews with the Bowl Yard Master after the incident and concluded he had played no part in the incident.

The FRA conducted interviews; reviewed audio, video, and locomotive downloads; participated in a reenactment of the incident; and took measurements. Copies of all railroad accident reports, diagrams, drawings, and police department reports were obtained and reviewed. The testing and training records of both the Conductor and Engineer were reviewed, with no exceptions taken.

An FRA inspection was conducted on all locomotives involved in the incident and no mechanical or safety defects were noted, other than those caused by the incident.

The ALS charged the Locomotive Engineer with failure to comply with the General Code of Operating Rules 5.3.3 and 5.3.6 and Rule 70.3 of the Carrier’s Safety Rules. However, a formal investigation, held by the ALS on Sept. 22, 2006, failed to substantiate these charges and no disciplinary action was issued. A copy of the transcript of the investigation was obtained and reviewed.

Personnel from the East St. Louis Police Department responded to investigate the incident. A copy of their report was obtained and reviewed, with no violation of law or ordinance found. The St. Clair County Coroner responded, and a copy of the report was obtained and analyzed during this investigation.

Results of FRA’s post-accident toxicological testing of the deceased, the Engineer, and the Bowl Yard Master were reviewed and found to be negative.

## **Analysis and Conclusions**

The video from the clerk’s yard camera was reviewed and showed some of the area in which Yard Job YAS271 was working between 11:18 p.m. and 11:32 p.m. on Sept. 10, 2006. The video shows the Conductor giving some hand signals with his lantern. The video also shows what looks like the Conductor applying the hand brake on Locomotive No. UP 9379 after it had been set to the “D” Yard Lead Track. The video verifies that Locomotive No. UP 9379 did not move after it was shoved east on the track for the second time and Yard Job YAS271 cut away from it.

The audio recording of the radio channel for Yard Job YAS271 was reviewed for the time period between 11 and 11:59 p.m., Sept. 10, 2006. During the review of this recording, the Conductor could be heard giving some voice commands to the Engineer via radio. In addition, the recording revealed that at no time during the incident was the emergency broadcast made, as required by Title 49, Code of Federal Regulations (CFR) Section 220.47.

The review and comparison of the audio and video records showed the clock on the video was one minute, 31 seconds faster than the clock on the voice recorder.

A review of the download from the locomotive in use by the Engineer on Yard Job YAS271 on Sept. 10, 2006, showed that movement started back onto the Roundhouse Lead at 11:32:29 p.m. and stopped at 11:33:11 p.m. The total distance of the move was 152 feet, and the maximum speed during the move was 3 mph. The download showed that no brakes were applied until after the move had gone 87 feet at 11:32:51 p.m., and this was the independent brake, which then showed to have been immediately released. The next time the brake showed being applied was at 11:33:05 p.m., at 138 feet. It also showed to have been immediately released. The final brake application showed to have been made at 11:33:08 p.m., at 146 feet. It remained applied until the locomotive came to a stop at 11:33:11 p.m. During the formal investigation held by the ALS on Sept. 22, 2006, the Engineer was questioned about her use of the locomotive brake as she moved onto the Roundhouse Lead. She stated that she had the brake applied throughout the move. When questioned about the Engineer's statement, the Senior Manager of Operating Practices stated that the locomotive she was using had an older style event recorder which would not record the brake application unless at least 15 pounds of air or more were applied, indicating that the Engineer could have had the brakes applied and it would not have been recorded.

A re-enactment of the incident showed that the Conductor would have gone out of the Engineer's sight after having moved approximately 67 feet. At that point, the locomotive the Conductor was riding was 25 feet, 9 inches from the locomotive which was struck.

When the Conductor shoved Locomotive No. UP 9379 onto the "D" Yard Lead Track, he initially failed to leave it clear of the Roundhouse Lead Track. After realizing that it obstructed his movement onto the Roundhouse Lead, the Conductor then had the Engineer move the locomotives back onto the "D" Yard Lead and shove Locomotive No. UP 9379 farther east on the track. However, this second attempt to get the locomotive in the clear also failed. Without realizing that Locomotive UP 9379 would not clear his movement, he boarded the step of Locomotive No. UP 9413 while on the leading end of the shove. In sight of the Engineer, he used a hand signal directing her to begin moving onto the Roundhouse Lead Track. When interviewed, the Engineer was asked if the Conductor had indicated the number of car lengths or distance to go before the move on to the Roundhouse Lead Track began and the reply was that he had not. As he rode the step of Locomotive No. UP 9413, not realizing that Locomotive No. UP 9379 was not in the clear of his track, the Conductor was crushed between the two locomotives.

The Conductor failed to get Locomotive No. UP 9379 clear of the Roundhouse Lead Track, which is required by Rule 81.8.1 of the Carrier's Safety Rules. He also failed to maintain a lookout for close clearance and to stop short of the same locomotive as he moved equipment onto the track, as required by Safety Rule 81.8.2 and the General Code of Operating Rules 6.28. After

the use of hand signals was discussed during the job briefing, when the Conductor started using the radio in conjunction with the hand signals, the Engineer should have stopped the work and called for another job briefing to clarify what form of communication was to be used as required by the General Code of Operating Rules 5.3.6. As a result, the use of both hand and radio signals continued right up until just prior to the incident. The job briefing held prior to beginning the switching did discuss the moves to be made; however, when the job changed as a result of Locomotive No. UP 9379 initially being left foul of the Roundhouse Lead, another briefing was not held as required by Safety Rule 70.3. Direct conversation between the Conductor and Engineer could have allowed for a full discussion on the need to get the locomotive clear of the Roundhouse Lead Track. Also, both the Conductor and Engineer, with their experience working in this yard, should have been aware that the move onto the Roundhouse Lead would, at some point, take the Conductor out of the Engineer's sight if he rode it, as he ultimately did. With the Conductor's decision to ride the step of Locomotive No. UP 9413, a job briefing should have been held to discuss the need for radio communication. Had the Conductor been directing the move using his radio and providing the Engineer with car lengths or distance to travel, he would have had to look ahead of the movement and focus on conditions on and around the track directly ahead of him.

When the Locomotive Engineer discovered the Conductor lying on the ground between the two locomotives, both Title 49 CFR Section 220.47 and the General Code of Operating Rules 2.10 required her to initiate an emergency radio transmission preceded by the word "emergency," repeated three times. When interviewed, the Engineer stated that she had a hand-held radio while on the ground looking for the Conductor. However, she stated that she did not use it to summon help, but chose instead to go into the general office building and call the Bowl Yard Master. This failure to comply with the CFR and the Carrier's operating rule may have resulted in a delay in summoning help for the Conductor and in making notification of the incident to officials and others in the area.

## APPLICABLE RULES

### General Code of Operating Rules

#### **2.10 Emergency Calls**

Emergency calls will begin with the words "Emergency, Emergency, Emergency." These calls will be used to cover initial reports of hazardous conditions which could result in death or injury, damage to property or serious disruption of railroad operations such as:

- derailments;
- collisions;
- storms;
- washouts;
- fires;
- track obstructions; or
- emergency brake applications.

In addition, emergency calls must be made for the following:

- over-running limits of authority; or
- over-running stop indications.

Emergency calls must contain as much complete information on the incident as possible. All employees must give absolute priority to an emergency communication. Unless they are answering or aiding the emergency call, employees must not transmit until they are certain no interference will result.

### **5.3.3 Signal Disappearance**

If a person disappears who is giving the signal to back or shove a train, engine, or car, or the light being used disappears, employees must stop the movement, unless the employee on the leading car controls the air brakes.

### **5.3.6 Radio and Voice Communication**

Employees may use radio and other means of voice communication to give information when using hand signals is not practical. Employees must make sure crew members:

- Know which moves will be made by radio communication; and
- Understand that while using the radio, the Engineer will not accept any hand signals, unless they are Stop signals.

## **Safety Rules:**

### **70.3 Job Briefing**

Use the Job Briefing process:

- Before work begins, when all persons, including employees and contractors, are present;
- After work begins, if person(s) arrive who missed the original job briefing; or
- When changes occur to the work plan or conditions change.  
Each work plan must consider hazards, assign specific responsibilities, and explain those assignments.

## **81.8 Close Clearances**

### **81.8.1 Avoiding Fouling Hazards**

Do not leave cars or engines standing where they will foul equipment on adjacent tracks or cause injury to others riding on the side of a car or engine. When machines, tools, material or other equipment may foul adjacent tracks, notify the Yard Master, Train Dispatcher, or Supervisor. They must arrange to restrict movement on the affected track(s) until the work is completed and the fouling hazard is eliminated.

### **81.8.2 Maintain Lookout**

Keep a careful lookout in both directions for trains, engines or cars on adjacent tracks. Look for other close clearances when duties require any part of the body to be extended beyond the side of a moving or standing engine or car.

## **Title 49 Code of Federal Regulations**

### **§220.47 Emergency radio transmissions:**

An initial emergency radio transmission shall be preceded by the word "emergency," repeated three times. An emergency transmission shall have priority over all other transmissions, and the frequency or channel shall be kept clear of non-emergency traffic for the duration of the emergency communication.