



National Transportation Safety Board
Washington, D.C. 20594

Railroad Accident Brief

Accident No.: DCA-09-FR-005
Location: Selkirk, New York
Date: May 10, 2009
Time: 6:38 PM, Eastern daylight time¹
Railroad: CSX Transportation
Fatalities: 1
Type of Accident: Remote control locomotive switching operation

The Accident

On Sunday, May 10, 2009, about 6:38 p.m., a CSX Transportation (CSX) remote control operator (RCO) was struck and killed by a train consisting of a remote controlled locomotive and seven cars (yard job number Y296-10). At the time of the accident, the RCO was working alone on track 23 in Selkirk Yard in Selkirk, New York. The RCO was controlling the train remotely at the east end of the yard and was planning to couple additional cars in preparation for movement onto another track. Before the RCO could add the additional cars, he had to replace a missing coupler knuckle² on what was to be the eighth car of the train consist. He was in the process of coupling the seventh and eighth cars when the moving equipment struck him. At the time of the accident, it was daylight and sunny, and the temperature was 54° F.

After the RCO was struck, the yardmaster received an automated alarm "... CSX 8479 Operator A is down, Operator A is down, Operator A is down" followed by a radio communication from the RCO that he was down and hurt. When other CSX personnel working in the yard also heard the alarm and radio communication indicating that the RCO was down, they rushed to the location where he was working. The yardmaster immediately called 911, and emergency response personnel from the Bethlehem Emergency Medical Services (EMS) arrived on scene about 9 to 10 minutes after being notified.³ The RCO was alive when the emergency response personnel arrived; however, he died en route to the hospital.

¹ All times in this brief are Eastern daylight time.

² A *knuckle* is the movable portion of a drawbar coupler, which is used to couple (connect) rail cars.

³ Bethlehem Emergency Medical Services is a volunteer service located about 3 miles by highway from the Selkirk terminal.

Investigation

Track 23 is located in the classification yard at Selkirk Terminal. The track is 2,743 feet long and runs east to west. Cars are released on the hump and run west to east. An inert retarder protects the east end of the track. The inert retarder on track 23 is 45 feet long and weighs 132 pounds. It has nine springs and was installed new in 2006. The retarder is located 192 feet east of the accident location.

Prior to April 20, 2009, CSX practice in Selkirk yard allowed utility workers, when assigned to a yard crew job, to assist the RCO whenever there was a need to replace a knuckle. Following an April 20, 2009, inspection, a Federal Railroad Administration (FRA) inspector filed an operating practices violation⁴ for a utility worker performing work on equipment without blue flag protection.⁵ The utility worker that was the subject of the violation had been assigned to a RCO yard crew job. On April 27, 2009, CSX distributed instructions to all divisions explaining the acceptable duties of a utility person when attached to a train crew or RCO.

Statements by other remote control operators and utility workers indicated that these new instructions had resulted in daily confusion, inconsistencies, and misunderstandings for the utility workers when assigned to a RCO yard job to replace a missing knuckle. Because of these misunderstandings, a CSX trainmaster had a discussion with the yardmaster earlier on the day of the accident to make it clear that only an RCO and not a utility worker was allowed to replace a missing knuckle. This resulted in the RCO that was assigned to the job Y296-10 working without a utility worker.

A review of radio transcripts from before the accident found a conversation between two unidentified employees about replacing knuckles that included the statement, “it was allowed today.” The recording continued with “I don’t know why they change it from one day to the other is beyond me, but they say it does.”

Prior to the accident, the Y296-10 RCO had a radio conversation with the panel conductor.⁶ In this conversation, the RCO reported that there were two missing knuckles on the equipment he was to couple and move to another track. A utility worker in the area heard the radio communication and offered to help, but the RCO declined the offer. The RCO stated that he would look around the adjacent yard tracks to see if there were any knuckles and pins lying around and that he would replace the knuckles and pins himself. The cars with the missing knuckles had been reported to mechanical repair personnel 2 days previously by another RCO,

⁴ CSX was cited for violating Title 49 *Code of Federal Regulations* 218.22(C)(5), 218.27(B2), and 218.27(E)(1).

⁵ Blue flag, or signal, protection is described in Title 49 *Code of Federal Regulations* Part 218, Subpart B, “Blue Signal Protection of Workers,” which prescribes minimum requirements for the protection of railroad employees engaged in the inspection, testing, repair, and servicing of rolling equipment whose activities require them to work on, under, or between such equipment and subjects them to the danger of personal injury posed by any movement of such equipment.

⁶ The *panel conductor* reports to the yardmaster and is in charge of the RCO yard jobs in his assigned areas of the yard.

but the mechanical personnel had not yet replaced the knuckles.⁷ Another CSX employee who was working on track 25 observed the RCO using a cut lever⁸ that was found on the ground and used as a tool to drag a knuckle⁹ eastward about three car lengths (about 150 feet).

The panel conductor told investigators that shortly after the RCO had contacted him about the missing knuckles, he received a radio transmission from the RCO calling for help, which was immediately followed by a “man down” alarm. The design of the remote control box, or operating control unit (OCU), is such that when tilted beyond 45 degrees (+/- 15 degrees) from vertical, for more than 1 second, it sounds an audible alarm for 5 seconds, and if it is not restored to an upright position, a command is sent for an emergency stop of the locomotive. After 10 seconds, if an OCU is not restored to an upright position, it transmits a radio announcement for the unit identity (locomotive number) followed by the message, “Operator A is down.”

Several other CSX employees in the area heard the emergency announcement and went to the accident site. The RCO was found between tracks 23 and 24, with his OCU on the ground between the seventh and eighth cars. The RCO had worn the OCU on a large Velcro belt. There were marks in the coupler pocket¹⁰ of the seventh car and on the OCU consistent with one having been struck by the other. One of the responding CSX employees had received training in remote control operation and used the OCU to move the equipment. He left a gap between the seventh and eighth cars of about 23 feet to provide access room for EMS personnel. (See figure 1.)

The EMS personnel transported the severely injured RCO to the Albany Medical Center where he was pronounced dead. The Albany County coroner determined the cause of death as multiple rib fractures, rupture of right diaphragm, and extensive hepatic maceration. Toxicological testing performed was negative for drugs and alcohol.

The investigation determined that earlier during that shift, the RCO had replaced a missing coupler knuckle pin on the fifth car, and, after coupling the equipment, had moved the train westward toward the remaining cars on track 23 without incident. It could not be determined where he positioned himself to perform this operation, but he stopped the train short of the eighth car (AWXX 20642) that was also missing a knuckle. The RCO obtained a knuckle pin and applied the knuckle to the car without inserting the knuckle pin. It appears that he set the knuckle in the coupler and closed the knuckle.

⁷ Two days before the accident, another RCO reported the missing knuckle on the same car and was told that the mechanical department would meet him with a knuckle. Then the RCO was told by his supervisor not to replace the knuckle, and instead he was sent to another track.

⁸ A *cut lever* is a long steel rod which extends from one or both corners of a rail car and allows someone to disengage the knuckle pin allowing the knuckle to open from the side of the car.

⁹ A knuckle weighs 79.2 pounds.

¹⁰ The *coupler pocket* is the space between the coupler system and the end of a car that allows for coupler movement.

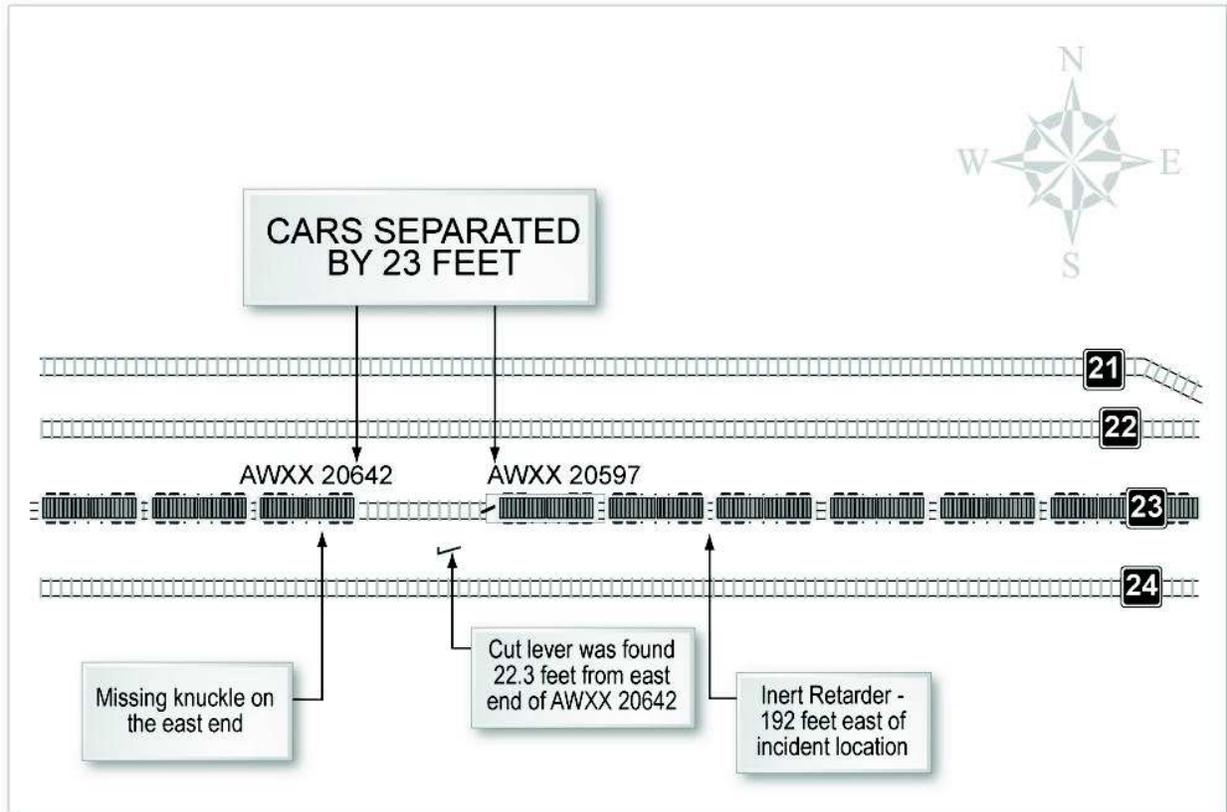


Figure 1. Accident site on track 23.

The locomotive was equipped with an event recorder to record such parameters as time, speed, direction, throttle position, and braking along with other FRA-required parameters. The recorder also had the ability to record the commands from the OCU to the locomotive. The review of the recorded data by investigators indicated that the RCO stopped the train about 35.3 feet from the eighth car at 18:19:23. The next movement recorded was westward at 18:38:33; this allowed about 19 minutes 10 seconds for the RCO to install the knuckle and initiate train movement. The first braking application was recorded at 18:38:49 with the train coming to a stop at 18:38:55. The train separation distance calculated was between 3.2 feet and 5.4 feet when the RCO was struck between 18:38:48 and 18:38:49.

Postaccident observations by witnesses indicated that the knuckle of the eighth car was hanging from the east end coupler and was tilted outward from the top about 3 inches. The knuckle pin, which would normally have been inserted in the coupler and knuckle as a hinge, was found on the ground next to the RCO. One of the witnesses stated that he picked it up and placed it between the wheel and rail of the eighth car to act as a stop. The coupler of the west end of the seventh car was found skewed to the south with the knuckle closed.

It is likely that after the RCO started the train movement, he may have thought that the cars might not couple properly because of the position of the coupler. He then stepped between the moving equipment to reposition the knuckle of the eighth car without stopping the train. However, it could not be determined whether the knuckle on the seventh car was closed before the accident or closed because of striking the eighth car.

CSX Transportation Guidelines

CSX Safety Rule TS-15, “Going Under or Fouling Standing Equipment,” effective January 1, 2009, addresses a three-step protection requirement as it applies to remote control equipment, train separation, and when blue flag protection is required for a utility worker when not attached to a train crew. To provide three-step protection on remotely controlled equipment, the operator must (1) Place the speed selector lever to the stop position and, if necessary, make a brake pipe reduction; (2) Place the direction selection toggle switch to the Neutral position; and (3) Communicate with the employee requesting the protection or conduct a job briefing to make certain the three-step protection is applied. Another CSX safety rule requires a 50-foot space between cars when someone has to go between cars to prepare them for coupling. The RCO in this accident placed himself between moving equipment and the standing cars even though he had less than the specified 50 feet of separation.

Personnel Information

The RCO began his railroad employment on May 29, 2000, and received his locomotive engineer certification as a remote control operator on July 28, 2008. His training test scores were in the 90th percentile. He had two remote control operator evaluation tests by a qualified RCO supervisor: one on July 24, 2008, and the most recent on April 8, 2009, receiving scores of 96 and 100, respectively.

The RCO was on his regular assignment and had been assigned to the Y296-10 yard job since April 1, 2009. Prior to that assignment, he had worked another RCO assignment in the same yard. The RCO had been off duty from 9:05 p.m. on May 9 and started his assignment at 2:30 p.m. on the day of the accident. The normal assignment for the Y296-10 was from 2:30 p.m. to about 9:00 or 10:00 p.m. 5 days a week, and the shift normally lasted about 7 to 8 hours. He had been on duty for about 4 hours when the accident occurred.

Federal Regulations for Remote Control Operations

On February 14, 2001, the FRA issued Safety Advisory 2001-1 to establish recommended minimal guidelines for the operation of remote control locomotives. This advisory is neither mandatory nor a regulation. However, FRA regulations permit train crewmembers to replace a knuckle or air hose on a train en route. A train crewmember of an RCO is allowed to do the same when in the yard. In neither case is blue flag protection required because they are actual members of the train crew. Safe operating practices dictate that train crewmembers know the whereabouts of every other crew member at all times. Thus, blue flag protection is necessary only for those who are temporarily attached to the crew, such as utility employees.

Testing of Operating Control Unit

The RCO was using the Cattron OCU shown in figure 2. Cattron tested the recovered unit onsite and again later at the Cattron facilities in Sharon, Pennsylvania. No operational anomalies were found. Onsite testing showed no differences between the simulated recorded operations of the unit from the event recorder when compared with the use of another OCU.



Figure 2. Cattron operating control unit.

The testing determined that the operation of the OCU was consistent with FRA Safety Advisory 2001-01 and that no inadvertent operation of the locomotive could be initiated from the OCU.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the CSX Transportation remote control operator being struck and killed on May 10, 2009, in Selkirk Yard in Selkirk, New York, was the operator's loss of situational awareness when he stepped between moving equipment while attempting to couple the equipment, in violation of CSX Safety Rule TS-15.

ADOPTED: March 31, 2011