



National Transportation Safety Board

Washington, D.C. 20594

Railroad Accident Brief

Railroad Accident Number:	DCA-03-FR-004
Location:	San Juan Capistrano, California
Date and Time:	April 1, 2003, 1:38 p.m. (Pacific standard time)
Accident Type:	Train striking maintenance-of-way workers
Companies:	Herzog Contracting Corporation National Railroad Passenger Corporation Southern California Regional Rail Authority
Train:	Amtrak train 774
Injuries:	None
Fatalities:	2

Synopsis

About 1:38 p.m., Pacific standard time, on April 1, 2003, eastbound¹ National Railroad Passenger Corporation (Amtrak) train 774 struck two maintenance-of-way workers at control point² (CP) Avery near San Juan Capistrano, California. Both workers were fatally injured. According to event recorder data, train speed was 90 mph. The Amtrak 774 engineer said that he sounded the horn and placed the train into emergency braking moments before impact. The fatally injured workers were part of a five-person crew employed by Herzog Contracting Corporation (Herzog) to provide maintenance-of-way services under a contract with the Southern California Regional Rail Authority (Metrolink). The accident occurred on tracks owned by the Orange County Transportation Authority and operated by Metrolink. The weather was clear and dry, with a temperature of 66° F.

Events Preceding the Accident

The maintenance-of-way crew reported for duty at 7:00 a.m. on April 1, 2003, at a field office at Sand Canyon, adjacent to Metrolink tracks at milepost (MP) 183.95 in Irvine, California. Their work involved inspecting switches and turnouts at various

¹ Directions used in this report are railroad timetable direction, which may vary from actual compass direction. Metrolink designates east and west as its railroad timetable directions on the Orange Subdivision. Eastbound is toward San Diego.

² *Control points* are locations where the train dispatcher can command signals and switches to direct train movements.

locations along the Orange Subdivision. The foreman/employee in charge³ said he held a job briefing⁴ with the crew at the first job site before they entered the right-of-way. No other job briefings were held, although the workers entered the right-of-way and inspected several locations before arriving at CP Avery about 1:30 p.m.

At CP Avery, some of the crew noticed an Amtrak train pass just before they entered the right-of-way.⁵ Meanwhile, Amtrak train 774 had departed Los Angeles eastbound toward the workers' location.

At CP Avery, the maintenance-of-way crew's work involved checking the turnout for loose fasteners and other defects and recording measurements. Two individuals began work at the switch points, and the other three walked westward to the turnout frog.⁶ The employee-in-charge had earlier designated himself as the lookout and was one of those at the frog. The employee-in-charge told investigators that while at the frog he assisted with some measurements. He said that he did not formally designate anyone to serve as watchman while he performed this work but that "there was somebody [one of the other workers] looking for me." The employee-in-charge did not have an audible warning device (whistle or horn) and a white disc with which to warn the other workers of an approaching train as required by Metrolink procedures. He told investigators that he planned to verbally warn the other employees if he needed to do so.

When work was completed at the frog, the three workers walked eastward to join the other two workers who were near the switch points. The employee-in-charge said that he asked the two workers near the switch points if they were finished. When they answered that they were, he said he told them, "let's go," after which all five workers walked eastward.

As they walked east, the employee-in-charge and two workers were walking clear of the tracks. Another of the workers was walking between the rails, and another was walking on the tie ends about even with the switch machine motor. All four workers and the employee-in-charge had their backs to the direction from which eastbound Amtrak train 774 was approaching.

The train 774 engineer stated that he was operating on *clear* signals at the authorized track speed of 90 mph as he approached the accident site. He said that shortly after rounding the right-hand curve at Laguna Niguel Station, he noticed personnel on the right-of-way at CP Avery. He said he first sounded the whistle then put the brakes into emergency and shortly thereafter heard an impact. One of the workers walking clear of

³ The employee-in-charge is "responsible for the safety, instruction, performance and On-Track Safety of all employees under his jurisdiction". (Metrolink *Roadway Worker On-Track Safety Manual* section XII)

⁴ A *job briefing* is a short job-site meeting among workers where work tasks and safety precautions are discussed.

⁵ Metrolink train-dispatching records indicate westbound Amtrak train 775 passed CP Avery at 1:28 p.m.

⁶ *Frogs* permit rail wheel flanges to cross over opposing rails in turnouts.

the tracks said that he heard the train whistle just before train 774 struck and fatally injured the workers walking between the rails and on the tie ends.



Figure 1: Accident location looking west.



Figure 2: CP Avery viewed from eastbound train.

Job Briefings

The job briefing form completed that morning by the employee-in-charge before the crew began work had “track and time”⁷ checked as the method of on-track safety to be used. Under the comments section of the form, the following was entered: “will be working under watchman⁸ authority.” The employee-in-charge said that his original plan was to obtain track and time but that he later decided to work under watchman procedures. All members of the crew signed the job briefing form.

No further job briefings were conducted, although Metrolink procedures required the employee-in-charge to conduct follow-up briefings at each new work location. A follow-up briefing is also required when “on-track safety changes.” Shifting the lookout responsibility from one worker to another is such a change.

Lookout Procedures

The work at CP Avery was being performed under lookout procedures contained in Metrolink’s *Roadway Worker On-Track Safety Manual*. The manual describes the lookout duties and responsibilities as follows:

Watchmen are responsible for the lives of their fellow workers. It is their responsibility to watch for approaching trains and signal employees to clear the tracks. Watchmen must...warn employees in time for them to clear tracks at least 15 seconds before the train arrives...(1) Sound a warning whistle or horn. (2) Hold the white disc at arm’s length above

⁷ Under track and time, the train dispatcher stops train movements on a designated section of track.

⁸ The terms *watchman* and *lookout* are used interchangeably in the procedure.

your head. (3) Then, hold the white disc horizontally at arm's length, toward the place designated in the Job Briefing where employees are to go to clear the tracks.⁹

This procedure also requires that the lookout devote full attention (“must not perform any other duties, even momentarily”) to detecting approaching trains. Should it be necessary to appoint a different lookout, the procedures require the crew to clear the track and hold a new job safety briefing. Metrolink procedures also state that employees “shall not foul the track except when necessary.”

When using the lookout system, Metrolink requires a lookout to be able to provide a distinctive warning in advance of train arrival that allows employees to reach a predetermined point of safety at least 15 seconds before the train arrives. If field conditions exist that will not allow the 15-second clearance time with a single lookout, advance lookouts must be placed at a sufficient distance to provide a signal to the lookout at the work location. The lookout at the work location then signals the employees to clear the track. If advance lookouts are not used, an alternative system of protection, such as track and time, must be established. Advance lookouts were not in place at the time of the accident.

Sight distance observations indicated that an approaching eastbound train first became visible when it was about 2,415 feet west of CP Avery. At a track speed of 90 mph, the employee in charge had about 3 seconds to detect a train, sound a warning signal, and clear personnel from the track to meet the specified clearance time of 15 seconds before train arrival.

Rules Compliance

The investigation identified a number of procedural infractions that preceded the accident:

- A job briefing was not conducted at each new work location as required.
- The employee-in-charge performed duties as a lookout without the required warning equipment.
- The work location did not allow the employees to clear the tracks 15 seconds before a train arrived with only a single lookout in place.
- Lookout responsibility shifted while employees were fouling the track without the crew's being alerted through a follow-up job safety briefing.
- After the work was completed, the two employees who were later struck remained on the track, walking with their backs to an approaching train.

⁹ *Roadway Worker On-Track Safety Manual*, effective 7-12-2000, section 6.3.4 B.

- The employee-in-charge was not attentive to the approaching train movement.

Metrolink Efficiency Testing Program

One of the methods Metrolink uses to monitor the effectiveness of, and compliance with, Metrolink's on-track safety procedures is to conduct rules compliance field audits, commonly referred to in the railroad industry as "efficiency tests." Metrolink's efficiency test program is described as providing "supervisors the opportunity to acknowledge a job well done or to correct operating or maintenance practice deficiencies."¹⁰ These tests typically involve unannounced field observations, job site interviews, inspection of equipment, and review of paperwork such as job briefing forms. Results and corrective actions (if needed) are documented and tracked.

Metrolink established a goal for Metrolink and Herzog managers/supervisors to conduct at least four efficiency tests per month per manager/supervisor. Statistics are kept on this efficiency testing and are provided on a monthly basis to the chief engineer.

Metrolink provided records of efficiency tests on Herzog maintenance-of-way employees for the period June 2002 through March 2003. Approximately 70 Herzog personnel, including managers, supervisors, and craft employees are assigned to provide maintenance-of-way and structures services to Metrolink. These records indicate that on a systemwide basis, 123 tests were performed on Herzog employees during 68 observations¹¹ by 4 Metrolink managers.

Of 15 total Herzog employee tests performed on the Orange Subdivision, 12 were performed at Sand Canyon, the location of a field office where Herzog employees and supervisors report on and off duty each work day.

Records indicate that 10 tests had been performed on 4¹² of the employees involved in the accident during 6 observations by 1 Metrolink manager. Five of the six observations were performed at or near Sand Canyon, the field office location where the employees go on and off duty.

Herzog Management Oversight of its Employees

Metrolink's standard operating procedure (SOP) 17 establishes a requirement for Herzog supervisors to monitor employees' compliance with Federal Railroad Administration (FRA) requirements (one of which is roadway worker protection) by performing four efficiency tests per month. No efficiency tests are recorded as having been performed by Herzog managers/supervisors.

¹⁰ Metrolink *Engineering and Construction Efficiency Test Program 2002-2003*.

¹¹ A manager may record more than one test during a single observation of an employee.

¹² No tests were recorded for one of the employees.

Herzog representatives told Safety Board investigators that their supervisors performed field observations before the accident but that these observations were not documented and did not entail the same formal efficiency test format used by Metrolink.

Metrolink Internal Audits

Metrolink has developed a system safety program plan, which is a formal written document that identifies and assigns responsibility for all safety-related responsibilities within the organization. Metrolink first issued its system safety program plan in 1996. The current plan (dated June 2000) is described as “a means of integrating safety into all facets of SCRRRA [Southern California Regional Rail Authority].” The current plan covers 26 system safety elements. Element 26 of the Metrolink system safety program plan, titled “Safety Management Assessment Program,” describes an internal safety audit process where one-half of the plan’s elements are audited each year.

Attached to the plan are 20 SOPs covering safety-critical functions. Maintenance-of-way rules compliance and efficiency testing are included in the safety-critical functions. The SOPs are described as defining “standards and measurements of success and detail the process used to verify compliance with the SCRRRA-mandated requirements, including FRA or industry standards.”

The plan states that each of the 20 Metrolink SOPs in the plan will be audited annually. Metrolink officials told investigators that an internal safety audit of the roadway worker protection program had not been conducted before the accident. SOPs 16, 17, and 19 (which cover the roadway worker program) had also not been audited before the accident. Metrolink managers told investigators that such an audit began in November 2003 and is ongoing. Among other things, the report recommends that Metrolink managers work with contractors to revise safety-critical SOPs so they are consistent with the safety plan as well as field activities. The audit also recommends steps to better include contractors in monitoring for compliance.

Actions Taken Since the Accident

Amtrak

Amtrak issued a “rules alert” concerning this incident to its Southwest Division employees to heighten their safety awareness with regard to workers on the right-of-way.

Herzog

In addition to the safety stand-down meetings noted below, Herzog representatives stated that they now require that employees intending to work under a lookout system of protection review their plan with a manager who must approve it before the employees foul the track. Herzog also said that it has established an audit

procedure, adopted Metrolink's efficiency test procedures, and has begun conducting efficiency testing.

Metrolink

Metrolink, along with Herzog and other maintenance contractors, temporarily halted maintenance on the Metrolink right-of-way immediately after the accident and held safety stand-down meetings to review the incident and on-track safety procedures.

Metrolink formed a safety team comprising Metrolink and contractor managers to review on-track safety procedures and to recommend improvements. As a result of the review, Metrolink revised its lookout procedures by requiring lookouts to warn employees working on the track in time for them to clear the track at least 20 seconds before a train arrives; an increase from 15 seconds. Metrolink reissued its *Roadway Worker On-Track Safety Manual* in February 2004 with more specific language on the requirements that lookouts perform no other duties and that follow-up job briefings be held at new work locations and when lookout responsibilities transfer to another employee. Metrolink revised its job briefing form on June 1, 2003, to include entries for the name of the assigned lookout(s) as well as the sight distance from the work location to the point at which a train can be visually detected.

Metrolink representatives also reported that they implemented a more focused roadway worker efficiency test program that establishes 13 "safety-critical" tests. These tests cover job briefings, lookout duties, and lookout equipment. Metrolink's revised program requires that each employee-in-charge be tested at least once per year on each of the 13 safety-critical tests.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the accident was the inattentiveness of the assigned lookout as well as his failure to comply with applicable rules by posting advance lookouts or requesting another means of protection from train movements. Also contributing to the accident was the ineffectiveness of the Metrolink and Herzog efficiency test programs with regard to on-track safety procedure compliance.

Adopted: February 13, 2004