



National Transportation Safety Board
Washington, D.C. 20594
Railroad Accident Brief

Railroad Accident Number: ATL-00FR-004
Rail System: Metropolitan Atlanta Rapid Transit Authority (MARTA)
Train: MARTA train 103
Accident Type: Train striking technicians fouling the track
Location: Near MARTA Avondale Station in Decatur, Georgia
Date and Time: February 25, 2000, at 8:13 a.m.
Fatalities/Injuries: One fatality and one serious injury

On February 25, 2000, about 8:13 a.m., eastbound MARTA train 103 struck two automatic train control technicians who were inspecting signal equipment on the main track near Avondale Station in Decatur, Georgia. One of the technicians was fatally injured, and the other sustained serious injuries.

The Accident

On the morning of February 25, 2000, two MARTA automatic train control technicians were working near Avondale Station in Decatur, Georgia. (See figure 1 for a diagram of the MARTA system.) The more experienced of the two had assumed the role of senior technician; he telephoned the MARTA rail system control center at 8:03 a.m. to report that the technicians had completed their work on the track west of Avondale Station. He then asked permission to do an inspection in the Avondale Yard throat area¹ east of the station platform because they had been told that an irregular track circuit had been showing on the east rail. He did not request a safe clearance restriction for the inspection.

¹ The throat area is a crossover track that enters the yard.

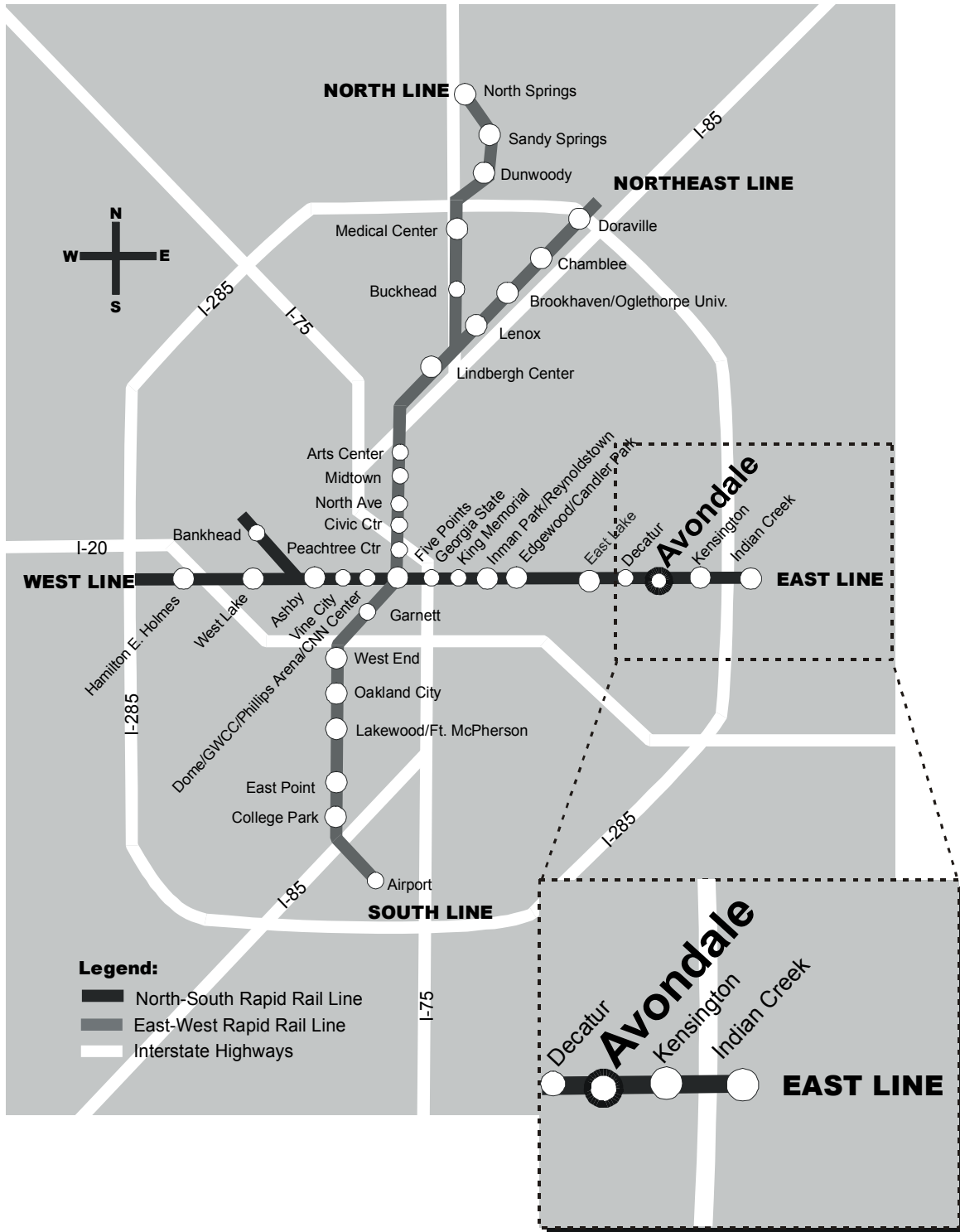


Figure 1. Map of the MARTA system, highlighting Avondale Station location.

The rail system control center controller gave the workers permission to inspect the eastern area. The controller did not ask them to apply for a safe clearance restriction, and he did not transmit a radio message advising train operators that a signal inspection was underway in the Avondale Yard throat area.

The controller asked the senior technician to advise the yard tower of the technicians' inspection activity. According to the yard tower supervisor, the senior technician telephoned the yard tower and asked permission to conduct an interlocking inspection in the yard throat area and mainline. The yard tower supervisor granted the request. He did not take any action to protect the two technicians.

About 8:12 a.m., train 103, traveling eastbound, arrived at Avondale Station. West of the station platform, the train was diverted from the main track to the middle track. The train departed Avondale eastbound in automatic mode with a cab signal-authorized maximum speed of 25 mph.

About this time, the technicians were at a relay box between the rails about 1,000 feet east of Avondale Station, about 27 feet past the switch where the middle track converged with the main track. (See figure 2.) While at this location, they unlatched and removed the relay box cover. The technicians had not placed flagging devices to warn train operators of their presence, nor had they placed shunts on the rail to activate the signal system as a warning for approaching trains.



Figure 2. Train approaching the accident location from Avondale Station. The relay box that the technicians had opened is circled and indicated by the arrow.

The train operator said that as soon as she saw the technicians fouling the track, she placed the train brakes in the “off” mode and stopped the train. (When train brakes are put in the off mode, they go into the emergency braking position.) She said that she could not recall whether she had sounded the horn. She said her primary concern was to stop the train as quickly as possible. She stated that when she saw the technicians, one was bending over looking down and the other was standing and looking down. She also recalled that both technicians had their backs to the train when it struck them, about 8:13 a.m. One of the technicians was fatally injured, and the other sustained serious injuries.

Rules and Procedures

The MARTA *Wayside Access Manual* covers maintenance and repair safety processes for wayside activities. MARTA also issues bulletins to guide roadway and automatic train control technicians who may need to foul the track.

Safe clearance procedures are used for slowing or stopping trains moving through areas in which workers are present. The manual states that safe clearance is “the method by which an authorized MARTA employee may gain access to the main line or yard wayside during revenue service hours, but which does not involve de-energizing third rail power or re-routing trains.” The manual’s safe clearance procedures require that:

The employee contact the Central Controller or Yard Tower Supervisor by two-way radio requesting the Generic, Verbal or Special restriction number from the Track Allocation Schedule.

MARTA’s safe clearance procedures further require that the controller notify train operators of the restriction number, location, and special instructions and receive confirmation from the train operators upon their receipt of the information. After the controller notifies the train operators, he/she is to advise the employee requesting the restriction to proceed under the restriction. The controller is to repeat the restriction notification to train operators at hourly intervals. The safe clearance procedures also require that:

All personnel requesting a Safe Clearance, Verbal, or Generic restriction must be accompanied by a qualified MARTA Flagperson or MARTA Supervisor while on the track wayside.

According to MARTA officials, the safe clearance procedures in the manual often were not strictly followed. The officials stated, for example, that it had become common safe clearance practice for wayside employees to make the initial restriction request by two-way radio but for controllers not to advise train operators of safe clearance restrictions. Instead, controllers relied on train operators to monitor radio transmissions to

learn of any restrictions. (In this case, the technicians involved in the accident did not make the call by radio; they used the telephone to contact the controller and yard tower supervisor.)

The safe clearance procedures state that they apply to MARTA employees attempting to “gain access to the main line or yard wayside.” They do not stipulate that employees need to follow safe clearance practices only if they are carrying out “work” on the track. In practice, however, wayside employees interpreted the safe clearance procedures as applying only when they were actually doing repair or maintenance work that required fouling the track. When they did inspections that were not expected to foul the track (or to foul it only very briefly), they used an informal protective procedure, which involved having one worker watch for trains while the other(s) did the inspection. MARTA’s safety director at the time of this accident² told Safety Board investigators that there were no written procedures for doing interlocking inspections on the right-of-way or any written requirement that one inspector watch for trains while another did the inspection. He indicated, however, that the accepted informal practice among MARTA track workers was for one inspector to watch for trains while another did the inspection.

After the accident, the MARTA director of track stated that the technicians who had been struck had been required to protect themselves and to notify the rail system control center when they needed to do work that required fouling the track. He indicated that if their work required fouling the track, they should have followed safe clearance procedures, which would have entailed obtaining a restriction number, after which the controller would have been required to make a radio announcement every hour to inform trains moving in the work area that workers were on the track. The current MARTA safety director also stated that the safe clearance procedures covered in the *Wayside Access Manual* applied to the work being done at the time of the accident and that the technicians should have followed those procedures.

Training

Training records indicated that both technicians had attended and passed wayside access procedures training, which covered flagging procedures. They had also successfully completed periodic rules classes and passed rules examinations.

² The MARTA safety director who served at the time of the accident left MARTA later in 2000.

MARTA Rules Compliance Program

According to MARTA's director of operations, supervisors made routine train ride checks and discussed violations with operators who failed to comply with operating procedures. A report was made only if a train operator failed to comply with a bulletin order, make a station stop, or comply with a stop signal. No other records were kept on rules compliance checks.

Before the accident, no MARTA employees except train operators were subject to a formal program of rules compliance checking. MARTA had no compliance program for operations center, maintenance-of-way, or signals employees. In addition, MARTA had no efficiency-testing³ program under which rail supervisors systematically observed train operations and assessed compliance with selected operating rules.

State Oversight

On April 16, 1993, Georgia designated the Georgia Department of Transportation as the State agency responsible for overseeing the MARTA system. This responsibility was delegated to the administrator for GDOT's Office of Intermodal Programs. As well as having the responsibility for the safety oversight of MARTA rail transit operations, the office is responsible for managing the planning and operations programs in support of the transit, railroad, marine, and aviation systems within the State. GDOT's staff for rail transit operations consists of a single individual.

Federal Transit Administration regulations allow States some flexibility about how actively they fulfill their rail transit oversight responsibilities. State agencies can delegate accident investigation duties to the transit agency and then review the transit agency's reports. State agencies can also hire contractors to perform some of their oversight functions. GDOT contracts with a local urban transportation consulting firm to provide rail transit technical expertise and to supplement its single-member staff for this activity. The consulting firm wrote the GDOT transit safety plan, and the firm conducts all transit oversight investigations for GDOT. The firm also advises GDOT on all inquiries related to transit safety.

The Federal Transit Administration requires GDOT to make an on-site safety review of MARTA every 3 years. The purpose of the review is to evaluate the efficacy and currency of the MARTA system safety plan and to ensure that MARTA is complying

³ Efficiency tests involve unannounced observations of operating employees, often with a test scenario such as a red signal, to verify that appropriate rules are being followed.

with its plan. According to GDOT's management, GDOT did its first 3-year audit of MARTA at the end of 2001. The audit found the MARTA program deficient in employee training and certification, adherence to rules and procedures, and system modification review and approval processes. Before 2001, GDOT had not done any independent safety audits at MARTA, nor had it done any independent investigations of MARTA accidents. GDOT has the authority to audit and observe all MARTA operations.

Postaccident Developments

As a result of the accident, on March 10, 2000, MARTA issued General Order 00-10, which specifically addresses "the protection and safety of all personnel whose job requires them to enter the MARTA rail system wayside for inspections...." MARTA subsequently incorporated protective requirements for workers conducting inspections in its operating rules, as reflected in its *Wayside Access Manual*, Appendix 1C, under the heading "Inspection Clearance Process." The appendix states that:

Inspection clearance is the method by which authorized MARTA employees may gain access to the mainline or yard rail right-of-way for inspection purposes only. The tools required for the specific inspection purposes are the only ones allowed to be used under this clearance process. This clearance does not require de-energizing the contact rail or restricting train operations. Trains operating in the inspection area may operate in automatic or manual cab signal (MCS) modes.

The new rule requires that an inspection team consist of at least two people. At least one member of the team must be at least level 3 certified, and one of the members must be designated the "Dedicated Lookout Person." The team may not enter the wayside until it obtains approval from the rail system control center.

The new rule requires that the lookout:

- Initiate contact with the rail system control center via the mainline two-way radio frequency and identify himself/herself as being in charge of the work team,
- State the reason for the inspection,
- Provide the exact location of the access and the limits of the inspection area, and
- Request permission to enter the wayside.

The rail system control center is required to:

- Notify all trains of the presence and location of wayside personnel by general broadcast (no acknowledgement is required from train operators), and
- Grant permission for the team to enter the wayside, if all applicable requirements have been fulfilled.

Once the team has permission to enter the wayside, the lookout must notify the control center if there is any delay in the team's entering the wayside. The lookout must also notify the center whenever the team enters or exits the wayside. He/she is required to maintain two-way radio communication with the center at all times, and the communication link must be verified every 30 minutes. The lookout is also required to "remain alert for trains while personnel are on the wayside."

Upon completion of the work and as soon as the team has exited the wayside, the lookout must tell the center by two-way radio that all personnel have cleared the wayside. Finally, the center is required to confirm the termination of the inspection clearance with the lookout and then to notify all trains by general broadcast that the inspection clearance has been terminated.

After the accident, MARTA reviewed its operations and maintenance rules and practices and made the following changes: it improved its training of operations and maintenance employees in wayside access procedures, and it added a requirement that its supervisors do daily audits of employees' compliance with rules and safety procedures. GDOT has accompanied MARTA supervisors while they do the audits and has determined that the audits are effective.

Probable Cause

The probable cause of the accident near the Metropolitan Atlanta Rapid Transit Authority (MARTA) Avondale Station on February 25, 2000, was the failure of MARTA to ensure that written safe clearance procedures were followed for employees doing inspections on the right-of-way.

Adopted: August 8, 2003