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Railroad Investigation Report: RIR-24-04

1 Port Authority Transit Corporation Train 2 Strikes Two Subcontractor Employees

Camden, New Jersey
October 14, 2022

1 Factual Information

1.1 Accident Description

On October 14, 2022, about 9:21 p.m. local time, Port Authority Transit Corporation (PATCO) train Westbound #1 struck and killed two subcontractor employees from JPC Group, Inc. on Main Track 2 on the Benjamin Franklin Bridge in Camden, New Jersey.¹ The train was traveling west at 33 mph and had a train operator (operator) and 68 passengers aboard; 8 passengers were in the lead car. At the time of the accident, conditions were dark and clear, and the temperature was 59°F.² Figure 1 shows the location of the accident.

¹ PATCO is a rapid transit system which runs between Philadelphia, Pennsylvania, and Camden County, New Jersey. It is a subsidiary of the Delaware River Port Authority.

² Visit [ntsb.gov](https://www.ntsb.gov) to find additional information in the [public docket](#) for this NTSB accident investigation (case number RRD23FR001). Use the [CAROL Query](#) to search safety recommendations and investigations.



Figure 1. Overhead view of the Benjamin Franklin Bridge.

Main Track 2 was scheduled to be placed out of service at 9:30 p.m. for a crew of contractor and subcontractor employees to put new caulking on columns on a bridge near the track's third rail.³ Skanska Koch, Inc. is the contractor and JPC Group, Inc. is the subcontractor for this long-term construction project on the Benjamin Franklin Bridge. This was the crew's third night of work at that site. Two of the subcontractor employees entered a close-clearance area on Main Track 2 before the track was out of service, and PATCO train Westbound #1 entered their work area too.⁴ Upon identification of the subcontractor employees on the track, the train's operator initiated emergency braking before striking them. The train's head end stopped about 100 feet (1.5 railcar lengths) west of where the two subcontractor employees were struck.

³ The *third rail* is an additional electric current rail used in some railroad systems to supply power to trains.

⁴ PATCO defines a close-clearance area as an area where there is no space for a person and a train at the same time. These areas require authorization from the dispatcher to occupy.

1.2 Before the Accident

1.2.1 PATCO Westbound #1

PATCO train Westbound #1 departed City Hall Station about 9:20 a.m. on Main Track 2. It was scheduled to be the last train before the track outage for the evening's bridge work and was delayed because the train's automatic train control system (ATC) was not operating, and, therefore, the train was moving at a lower speed.⁵ The ATC system stops the train under specific circumstances. Prior to the accident, the operator observed a brake application light on the console which indicated that the ATC system was activating the brakes, and the train was brought to a stop. The operator called dispatch (Center Tower) to inform them that he was deactivating the ATC system.⁶ By deactivating the ATC system, the train's automatic train stop feature would not operate, and the train would only be allowed to move at speeds up to 40 mph. The dispatcher gave the operator permission to move PATCO train Westbound #1 (with the ATC system deactivated) to the 16th Street Station, its final destination. The operator told the National Transportation Safety Board (NTSB) that with the ATC system cut out, the train's automatic train stop feature was not functional.

As the train continued traveling west, the operator observed two people (the subcontractor employees) on the right-of-way (ROW) with their backs to the train, leaning and looking toward traffic on the bridge.⁷ The operator stated that as soon as the two subcontractor employees were seen, he placed the train into emergency braking at 9:21:15 while traveling at about 33 mph and sounded the horn at 9:21:16. The train struck the two subcontractor employees at 9:21:19 and came to a stop at 9:21:24. The operator immediately called the Center Tower to tell the dispatcher that two people had been struck and that the power for the bridge and the third rail should be shut down.

1.2.2 The Work Group

The accident occurred in a close-clearance area along a portion of the Benjamin Franklin Bridge on Main Track 2. PATCO defines a close-clearance area as an area where

⁵ *Track outage* refers to railroad personnel placing "safeties" to prevent trains from entering the work area. A shunt is placed to stop the track circuit, a red flag is placed at each end of the track, and the third rail that powers the train is de-energized on the section of track inside the track outage.

⁶ PATCO refers to their dispatch center as Center Tower.

⁷ A train's *right-of-way* is, essentially, the envelope of the path it travels. PATCO rules state that any person performing work within 4 feet of the nearest rail or within 2 feet of the platform edge is working on the ROW.

there is not enough space for a person and a train to be located at the same time. These areas require authorization from the dispatcher to occupy.

According to PATCO procedures and interviews, the procedure to get authorization was that a PATCO employee-in-charge (EIC) would request the track outage through a dispatcher at Center Tower. The dispatcher, when operations permitted, would authorize the outage, de-energize the third rail, and give permission for the requester to enter that section of the ROW. The EIC would notify the PATCO signal maintainers to start placing their safeties to confirm that the third rail power was de-energized. Once the signal maintainers confirmed to the EIC that all safeties were placed and the third rail was de-energized, the EIC would confirm with Center Tower that they have permission to start work. The PATCO EIC would contact and inform a PATCO flagman that the contractor workers and subcontractor workers have permission to start work on the ROW. The PATCO flagman would contact a supervisor for the contractor who would then contact a supervisor for the subcontractor who would then inform the work group of contractor and subcontractor employees that they could begin work in the work area. Figure 2 shows the work area.

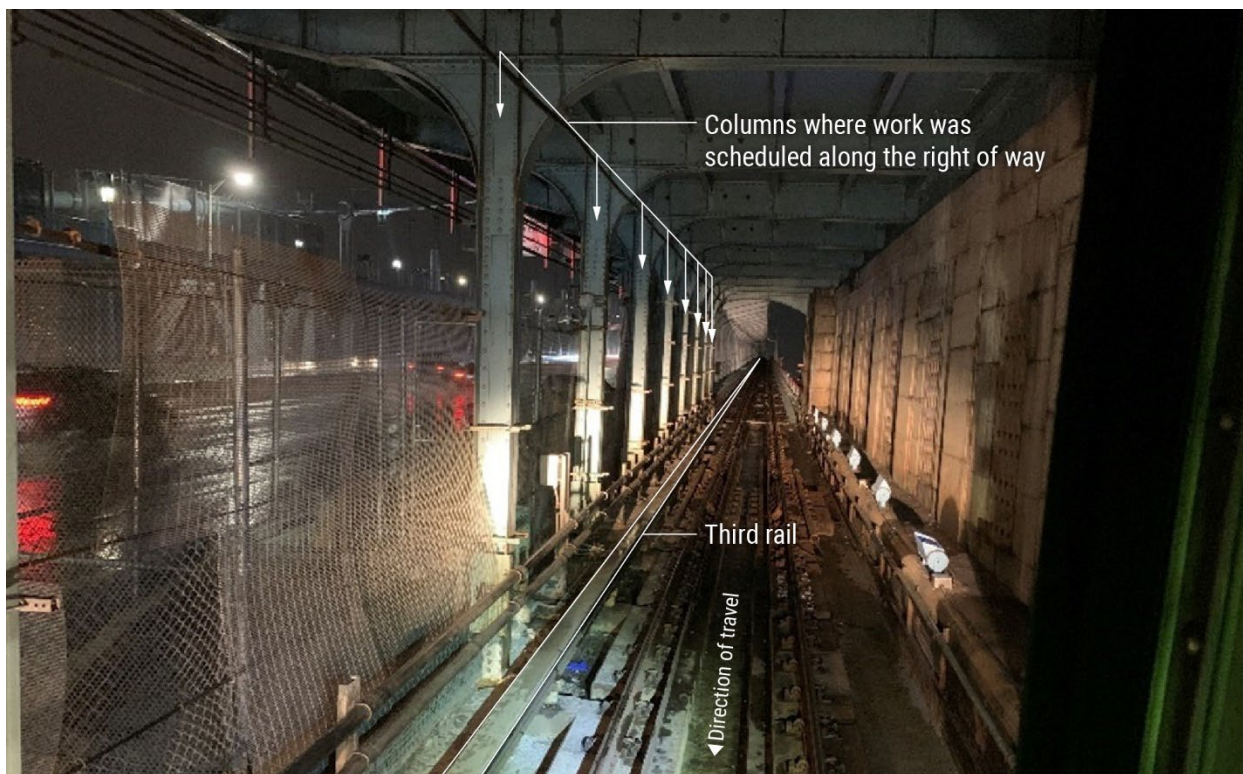


Figure 2. Photograph of Main Track 2, facing west, where the subcontractor employees were struck by PATCO train Westbound #1.

The Delaware River Port Authority (DRPA) contracted the long-term Benjamin Franklin Bridge rehabilitation project to Skanska Koch, Inc. and JPC Group, Inc. On the night of the accident, the DRPA identified three separate work sites along the bridge to

support rehabilitation work. At one work site, a track outage was planned for JPC Group employees to work on the steel columns next to the ROW. The track outage was scheduled to begin around 9:30 p.m. from Hall Interlocking to Market Interlocking on Main Track 2.

On the night of the accident, the subcontractor JPC Group employees met for a preshift meeting, including a job briefing, at 8:30 p.m. There were five employees in attendance, including the JPC Group supervisor. A Skanska Koch superintendent conducted a job hazard analysis with JPC Group employees. According to interviews the NTSB conducted with surviving attendees of the preshift meeting, the job briefing included work tasks and other safety points; however, it did not include ROW information, despite it being required as part of PATCO's ROW Safety Plan.⁸ According to interviews, JPC Group subcontractor employees and a supervisor went to their work staging yard following the job briefing to get materials. The group departed in two vehicles to the bridge work areas. One vehicle had two JPC Group subcontractor employees that would be working in the ROW where the accident occurred, and the other vehicle had the JPC Group supervisor and the remaining employees that were working in a different work area—a pedestrian sidewalk not on the ROW. The two subcontractor employees that were assigned to work the site near the ROW were tasked with putting new caulking on 11 columns that were located next to the tracks. (See figure 2.) This was their third night working in this work area.

Following the meeting, the JPC Group supervisor told the subcontractor employees, "Just head up; I'll meet you up there and we'll give you a hand". The JPC Group supervisor then took the pedestrian sidewalk work crew to their work area. When he circled back to meet up with the subcontractor employees caulking the bridge, he observed emergency vehicle lights at the work area.

Although the track outage was planned to start nightly between 9:00 p.m. and 10:00 p.m., the actual start time for these outages varied due to the weather or delayed trains. On that particular evening, the work was slated to begin around 9:30 p.m.

⁸ Job briefings should include, but are not limited to, the following topics: (a) personal protective equipment; (b) ROW worker certification verification; (c) the nature of the work to be performed; (d) operational and safety hazards that may be encountered; (e) current information on notices that could affect safety; (f) the means by which on-track protection is to be provided, including any protection on adjacent tracks; (g) the means of communication to be used between ROW workers; (h) the location where employees will clear the track; (i) identification and location of key personnel; and (j) any known special operating conditions. A job briefing is not considered complete until all affected ROW workers acknowledge that they understood the information and have signed a form attesting to that fact.

1.3 Personnel Information

1.3.1 PATCO Operator

PATCO's safety rule testing program is outlined in a document called "Rules Checks" and provides specific information on the skills and actions of the operator that managers are to observe.⁹ During calendar year 2022, the operator was safety rule checked 14 times. The operator was found to comply with all safety rule checks. The operator was also checked 8 times for operating rules and complied with all operating checks. He was also checked 11 times for reporting for duty and complied all 11 times.

1.3.2 JPC Group Subcontractor Employees

According to training records provided by the JPC Group, the two subcontractor employees received a PATCO Contractor Safety Briefing on June 27, 2022. That consisted of 8 hours of training, followed by a written test. According to PATCO, once that briefing was complete, the subcontractor employees were considered qualified to work on or around the tracks for 1 year afterward or until the qualification was revoked.

1.4 Autopsy and Toxicology

The Office of the Medical Examiner, Sewell, New Jersey, performed an autopsy on the two deceased subcontractor employees on October 15, 2022. This medical examiner serves Gloucester, Camden, and Salem Counties in New Jersey. According to the autopsy reports, their cause of death was multiple injuries, and their manner of death was accidental.

At the request of the Office of the Medical Examiner, NMS Labs performed toxicological testing of postmortem heart blood from both subcontractor employees. The testing detected fentanyl in both; 7.7 ng/mL in one and 1.7 ng/mL in the other.

⁹ PATCO's train operators are subject to rules checks on 15 skills and actions, including (a) stop hand signal; (b) fixed signal displaying "stop"; (c) flare burning red; (d) red cab signal; (e) permanent speed restriction; (f) automatic train control; (g) clearance card; (h) dark interlocking signal; (i) passenger emergency intercom; (j) wayside restriction board; (k) wrong route rule; (l) wayside speed restriction; (m) safety stop; (n) yard movements; and (o) train operating with automatic train control cutout to platform properly. For more detailed information, see the document "Section 6 Rules Check," found in the docket.

1.5 PATCO ROW Safety Plan

PATCO's ROW safety plan governs PATCO, contractor, and subcontractor employees while performing facility inspections, construction, maintenance, and repair duties on the system. The current plan has an effective date of January 5, 2019. The plan states that compliance with PATCO's ROW safety rules is mandatory, and failure to comply with them may result in disciplinary action. The plan defines a ROW worker as any individual within 4 feet of the nearest rail on the PATCO ROW.

The plan states that the EIC is responsible for the on-track protection and safety of employees, including contractor and subcontractor employees. The plan defines an EIC as a PATCO employee who is qualified to establish protection for roadway workers and work groups. The ROW plan states that the EIC is responsible for multiple safety actions including determining the method of protection, establishing on-track protection, conducting job safety briefings, the placement of protection flagmen, and removing tracks from service and authorizing their in-service release.

Before entering the ROW, the EIC is required to lead and document a job safety briefing to review operational and safety conditions. If conditions change, an additional job safety briefing must be held to discuss the new conditions. Job safety briefings should be conducted face to face, however, when not practical or possible to do so, telephone communication can be used.

1.6 Oversight

The Federal Transit Administration (FTA) provides federal funding for states to oversee safety on transit properties. The New Jersey Department of Transportation (NJDOT) Office of System Safety Oversight (SSO) is responsible for enforcing safety on PATCO. The FTA requires that each SSO perform an audit of each property they oversee every 3 years. NJDOT's SSO performed an audit of PATCO on September 23 through 29, 2020. In the audit, the SSO found that PATCO was noncompliant in eight issues related to roadway worker protection (RWP) and told PATCO to review and audit its RWP and, specifically, review and revise its ROW Safety Plan.¹⁰

1.7 Postaccident Actions

As a result of this accident, the NJDOT issued a safety action letter with five action items for PATCO to complete.

¹⁰ *Roadway worker protection* is an on-track safety program to protect personnel working on or near railway tracks from being struck by a train or other on-track equipment.

1. Before any contract work could continue, PATCO would have to hold a safety stand down with all PATCO Roadway Worker personnel to discuss this event and reinforcing PATCO's RWP program. At a minimum, the stand down required discussion on the role and responsibilities of the EIC and the requirements of job briefings. Once the safety stand down was completed, PATCO forwarded evidence of completion to NJDOT.
2. PATCO had to provide updates to NJDOT on the status of the investigation every 30 days. The status updates were to include information in accordance with NJDOT's oversight standards, including any corrective actions. It also required the investigation to remain open until the NTSB investigation concludes.
3. PATCO was to develop and implement a corrective action plan to ensure that procedural requirements identified in the RWP safety plan are followed, and ensure that the following FTA guidance that was provided to PATCO at the conclusion of the on-scene investigation was followed:
 - Roadway workers are not permitted to enter the ROW without PATCO representation.
 - Safety briefings are required to be completed by the EIC and cannot be delegated to anyone else.
 - PATCO EIC on the ROW must have a radio.
4. PATCO was to submit completed job briefing forms for all contracted work identified in the PATCO weekly track work log for the last 45 calendar days after the receipt of the document.
5. PATCO was to review the SSO program oversight monitoring activity table and take action to assure inclusion of the SSO program in weekly track work planning meetings and documentation availability.

2 Analysis

In this accident, PATCO train Westbound #1 struck and killed two contract employees from JPC Group, Inc. on Main Track 2 on the Benjamin Franklin Bridge in Camden, New Jersey. Before the accident, the team of contractor and subcontractor employees arrived at the bridge to perform concrete work during a scheduled track outage. However, two subcontractor employees entered a close-clearance area on Main Track 2 before the track was scheduled to be out of service and Westbound #1 entered their work area. Although the train's operator initiated emergency braking upon noticing two individuals were on the track, the train struck the two subcontractor employees.

Based on interviews and data from the train's event recorder, the NTSB determined that the train was traveling at 33 mph, below the maximum authorized speed of 40 mph, while traveling to the 16th Street Station, and that the operator responded appropriately by attempting an emergency brake application and sounding the train's horn. About 4 seconds elapsed between the brake application and the collision; therefore, the train operator did not have time to avoid the collision, and his handling of the train was not a contributing factor.

The investigation did not determine why the subcontractor employees fouled Main Track 2. Although postaccident toxicology test showed fentanyl in the systems of both contract workers, the NTSB could not determine if the amounts indicated impairment.

Based on interviews, two separate job briefings were conducted on the night of the accident. The PATCO EIC held an off-site job briefing for PATCO workers, and a Skanska Koch, Inc. superintendent held a job hazard analysis with the JPC Group subcontractor employees at their contractor yard. Although PATCO's ROW Safety Plan emphasized in-person job briefings, a PATCO-led job safety briefing was not conducted for the subcontractor employees at the job site and critical on-track safety information was not conveyed to them.

The NTSB believes PATCO's noncompliance with its own ROW Safety Plan shows organizational complacency. Adherence to the safety plan by conducting in person job briefings and documenting all employees' understanding of the briefing would have prevented this accident. Safety observations by PATCO and the NJDOT SSO could have brought attention to the fact that PATCO was not following their ROW Safety Plan. As a result of this accident, PATCO has held safety stand down meetings with discussions including the roles and responsibilities of the EIC and the required job briefings for employees who access track areas. PATCO completed this requirement in October 2023.

3 Probable Cause

The NTSB determined that the probable cause of the accident was the subcontractor employees being on the right-of-way on Main Track 2 before track outage had been established. Contributing to the accident was the exclusion of right-of-way information from the preshift job briefing, despite it being required under Port Authority Transit Corporation's Right-of-Way Safety Plan.

The NTSB is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in the other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)).

For more detailed background information on this report, visit the [NTSB Case Analysis and Reporting Online \(CAROL\) website](#) and search for NTSB accident ID RRD23FR001. Recent publications are available in their entirety on the [NTSB website](#). Other information about available publications also may be obtained from the website or by contacting –

National Transportation Safety Board
Records Management Division, CIO-40
490 L’Enfant Plaza, SW
Washington, DC 20594
(800) 877-6799 or (202) 314-6551