Issued: June 22, 2026 Railroad Investigation Report: RIR-26-10

Port Authority Trans-Hudson Corporation Third Rail Feeder Cable Fire

Location	Jersey City, New Jersey
Date	May 8, 2025
Accident type	Third rail fire
Train	Train 724 (westbound), nine-railcar set
Crew and passengers	Two crewmembers Unknown number of passengers
Track	Main track with communication-based train control
Hazardous materials	None
Fatalities	0
Injuries	5
Property Damage	$15,000

Summary

On May 8, 2025, about 7:34 a.m. local time, a third rail feeder cable caught fire on Port Authority Trans-Hudson Corporation (PATH). The fire occurred on track G in a railroad tunnel near Grove Street Station in Jersey City, New Jersey, and resulted in service disruption and, later, smoke-related injuries to five PATH employees.[1] Visibility conditions inside the tunnel were low with dim lighting at the time of the accident, and weather was not a factor.

Nine minutes before the accident, about 7:25 a.m., an operator of eastbound PATH passenger train 719 on track H (opposite track G) called the control desk to report a flame on track G within the Grove Street Station interlocking limits.[2] (See figure 1.)

[1] (a) Visit ntsb.gov to find additional information in the public docket for this NTSB accident investigation (case number RRD25FR011), including detailed factual reports about the circumstances of the accident. (b) Trains receive electrical motive power from the third rail, which is parallel to the running rail.

[2] An *interlocking* is an arrangement of switches and signal appliances that controls and directs train movements from one track to another track.

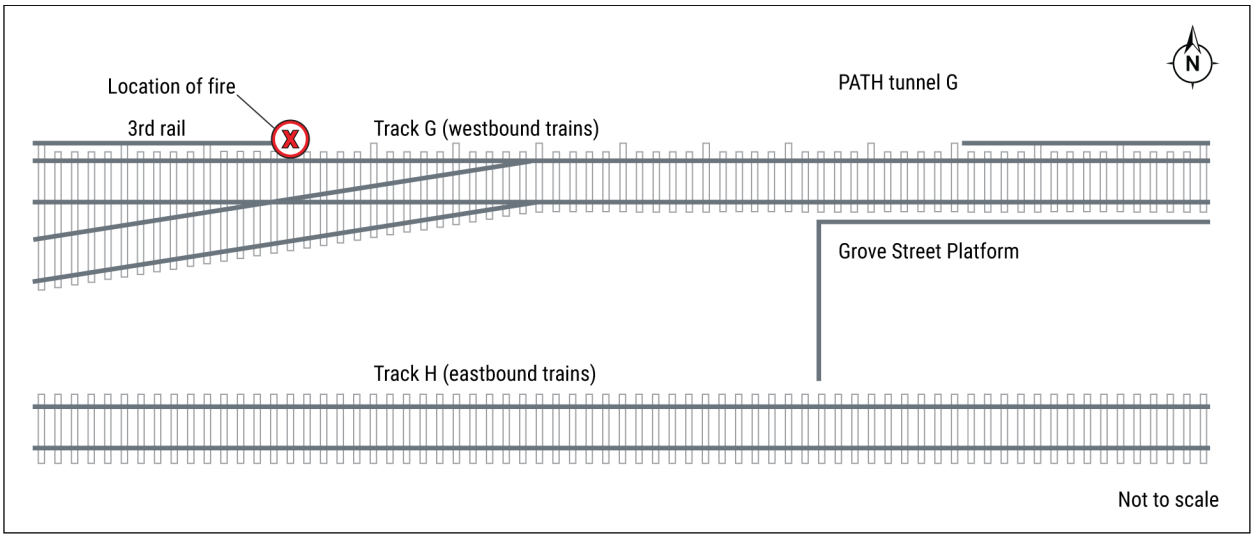

Figure 1. Accident location at Grove Street Station.

About 7:31 a.m., the engineer of westbound train 724 told the controller he saw an open flame at the interlocking west of the Grove Street Station platform. Train 724's conductor dismounted the train and, after the controller de-energized power to the third rail, extinguished the flame with help from a PATH operations examiner (OE) and car inspector.[3] Third rail power was restored about 7:40 a.m., and train 724 left the station. Subsequently, five westbound trains then passed through Grove Street Station.

At some point before 7:56 a.m., when a sixth westbound train (train 731) stopped at Grove Street Station, the fire on track G reignited. The OE and car inspector returned to the fire location along with a power railman, but this time they struggled to extinguish the fire.[4] Train 731 was still stopped at the station when smoke began to fill the platform area, and Port Authority police evacuated train passengers and the people on the station platform. Between 5 and 10 minutes later, police directed the train 731 crew to evacuate the station as well. The OE, car inspector, and rail power employee, along with the conductor and engineer of train 731, were treated and released from the hospital for smoke-related injuries.

The OE determined that the fire involved the third rail feeder cable. The fire had further damaged other third rail cables so PATH suspended train service about 7:58 a.m.

[3] At PATH, an *OE* develops and implements qualification and training programs. A *car inspector* inspects and tests railcars to ensure their safety and functionality.

[4] A *power railman* is responsible for the inspection, maintenance, repair, and renewal of the third-rail power system and associated components.

to make repairs.[5] PATH restored power about 8:43 a.m. once repairs were complete, and by about 9:00 a.m. train service in both directions had resumed.

Traveling west from the Grove Street Station passenger platform, track G is tangent and transitions through two curves and back into tangent with two sets of crossovers.[6] The maximum authorized speed through the station platform is 12 mph, increasing to 40 mph west of the station. The PATH signal system consists of a transmission-based train control system overlaid on a microprocessor-based wayside signal system.[7]

PATH owns and maintains its own electrical distribution network that supplies electricity throughout its transit system. Motive power supply is distributed from PATH substations to the third rail, which then supplies 650-volt direct-current power to the traction motors powering PATH train sets.[8] The third rail at the Grove Street Station interlocking was 150-lb. steel rail.[9]

In PATH interlockings, like the one at the Grove Street Station, short sections of third rail are located along turnouts to provide continuous propulsion power to trains as they traverse through the interlocking.[10] Sets of three or four parallel insulated copper conductor cables, also called "jumper" cables, connect these short sections of third rail in interlockings to maintain the third rail's electrical continuity.[11] Feeder cables connect electrical power, supplied by distribution stations, from the PATH power grid to the third

[5] As a temporary measure, the power railman removed the damaged cable and rerouted power from another area to energize that section of rail. PATH completed additional repairs overnight.

[6] On *tangent track*, the track alignment is straight and does not curve in either direction. A *crossover* is a connection between two adjacent tracks that allows trains to cross from one track to the other.

[7] *Transmission-based train control systems* are advanced train-control architectures that rely on continuous, high-integrity data communications between train-borne equipment and wayside or control center equipment.

[8] Generally speaking, the electrical circuit in the motive power network is comprised of the motive power supply (positive node), railcars (load), and running rail (negative node). The network is ungrounded.

[9] Steel rail is referred to by its weight per yard of rail, in this case, 150 lbs.

[10] In a third rail system, *collector shoes* ride along the surface of the third rail to conduct power to the train's propulsion system.

[11] Parallel conductors are used to increase the current-carrying capability of a cable or set of cables.

rail at strategic locations throughout the transit network. The third rail feeder cables at the accident location included one of these jumper cable sections.[12] (See figure 2.)

Figure 2. Section of third rail and burned feeder cables after the accident.

The National Transportation Safety Board (NTSB) recovered four sections of damaged feeder cables and sent them to the NTSB Materials Laboratory in Washington, DC, for examination.[13] Figure 3 shows the cable sections and their names.[14]

[12] The exact positioning of the portions of the cables relative to each other was not documented at the time of their removal.

[13] PATH employees removed the sections of cable during the postaccident work on the third rail.

[14] An additional portion of cable (Bb) was collected from a separate location. It was not related to the cables from the accident location.

Figure 3. Cable segments and their labels.

According to PATH employees, the feeder cables at the accident location were more than 25 years old. PATH employees also identified cable section Aa as the source of the fire and smoke in the accident. The NTSB's Materials Laboratory examination of cable section Aa revealed extensive corrosion: most of the cable's 37 individual copper conductors were separated and exhibited material loss.[15] This corrosion was not uniformly distributed but was concentrated within a short length of cable section Aa. The conductor wires in the other cable sections (Cc, Dd, and Ee) exhibited some surface oxidation, and their insulation jackets exhibited thermal damage consistent with exposure to the fire itself.

The NTSB reviewed PATH records, which indicated that the third rail was inspected at least biannually. The Federal Railroad Administration (FRA), which regulates track safety, has no prescribed standards for third rail power system inspections or

[15] Corrosion reduces the cross-sectional area of conductor wires. When the conductor's ability to carry an electrical load (current) is diminished but the load remains constant, electrical resistance and localized heating increase, along with the risk of ignition.

maintenance.[16] In an interview with the NTSB, the chief track supervisor stated that at the time of the accident PATH did not have a standard operating procedure for third rail inspections. Rather, the chief track supervisor provided ad hoc guidance for inspecting the third rail, directing employees to scan for visible or obvious problems or conditions such as a broken third rail, damaged insulators, or environmental conditions that could lead to failure. PATH records showed that the most recent observation of the third rail in the accident area was February 10, 2025, and it found no conditions at the accident location.

According to the chief track supervisor, PATH also lacked a standard training regimen for employees to become qualified on a uniform set of skills and protocols for inspecting the third rail system. According to the track supervisor, a new employee typically would work with an experienced employee for about 6 months of on-the-job training, then would complete a verbal evaluation to qualify as a power rail employee.

After the fire on May 8, PATH added five new third rail maintenance employees, including a third rail maintenance supervisor. PATH also created and implemented new-hire training and qualification programs as well as formal third rail training and qualification requirements, including standardized electrical operating instructions, structured classroom and field training, and written and practical evaluations to address their lack of training and maintenance standards.[17] Additionally, PATH initiated major capital projects, including third rail replacement, tunnel drainage improvements, and systemwide track and power infrastructure upgrades. The agency also continued to reduce or eliminate the buildup of combustible material in the track right-of-way through trash collection efforts and prioritized repairs to hazards in tunnels and other areas outside stations.

In October 2025, PATH developed and implemented formal electrical operating instructions to their track division, which standardized third rail inspections, maintenance, and operating requirements. PATH increased its third rail tunnel inspection frequency from quarterly to monthly and introduced an electronic inspection and recordkeeping system that included a process for recording and tracking the observation and repair of third rail system defects. PATH also introduced the use of thermal imaging technology in handheld devices and in artificial intelligence–assisted thermal imaging systems

[16] PATH track is regulated by the FRA under Title 49 *Code of Federal Regulations* (*CFR*) Part 213. State of good repair principles are not defined in 49 *CFR* Part 213, but are defined in Federal Transit Administration regulation 49 *CFR* 625.17(b) as "in a condition sufficient for the asset to operate at a full level of performance."

[17] PATH's standardized electrical operating instructions serve as a reference manual for all electrical employees for maintenance and repair tasks related to the third rail power distribution system.

mounted on revenue trains. These tools assist inspectors in identifying potential electrical problems related to defects such as loose, overloaded, or failing components by detecting abnormal heat levels.

Analysis

A third rail feeder cable caught fire in a PATH railroad tunnel in Jersey City, New Jersey, resulting in service disruptions and smoke-related injuries to PATH employees. NTSB investigators examined the track in the Grove Street Station area; reviewed data from signal logs, the train 731 event recorder, and the tunnel emergency ventilation system; and reviewed records related to train crew efficiency testing and FRA oversight of PATH. The following issues were excluded as causal to the accident: (1) track condition, (2) signals, (3) tunnel emergency ventilation system operation, (4) train handling, and (5) internal oversight (operational testing) and external oversight of PATH's emergency preparedness and related activities.

The NTSB conducted a postaccident examination of the third rail feeder cable that had caught fire and observed corrosion and separations in the cable's wire conductors concentrated in the section of cable from which the fire originated. The focused area of severe corrosion seen in that section of cable suggests a stray (or leakage) current causing localized electrolytic corrosion.[18] It is likely that the cable's insulation jacket had become compromised at the accident location, allowing a leakage current to exit the cable. With the conductor wires corroded and separated, the electrical resistance of the cable increased until the cable overheated and ignited. Electrolytic corrosion is a time-based material transport process causing material loss, and it would have been slow to develop and consequently visible for an extended period. Undamaged polyethylene thermal insulation would have made corrosion of the conductor wires far less likely. Given the level of corrosion at the time of the accident, visual inspections just before the accident could have identified the degraded insulation and poor cable condition, but PATH's most recent inspection before the accident on February 10 showed no defects, indicating the inspection was not satisfactory.

The FRA has no minimum standards for third rail inspections, and the NTSB learned that PATH had no standard operating procedures for third rail inspections at the time of the accident. According to maintenance staff, third rail inspection criteria were never clearly defined or communicated. PATH also had not documented any standardized training regimens or consistent qualification processes for employees who would be involved in the inspection of the third rail system. The lack of documented processes and training for maintenance inspections prevented adequate and consistent

[18] *Electrolytic corrosion* is caused by an electric current applied to metal from an external source.

inspections of third rail components and timely maintenance or replacement of compromised elements like the feeder cable. Consequently, the degradation of the cabling at the accident site went undetected, leading to its ultimate failure and fire.

Probable Cause

The NTSB determines that the probable cause of the May 8, 2025, third rail feeder cable fire on track G near Grove Street Station in Jersey City, New Jersey, was the Port Authority Trans-Hudson Corporation's inability to identify the degraded condition of electrical cabling, which led to a reduction in current-carrying capacity, excessive heating, and eventual ignition of the cable under normal operating loads. The inability to identify the degraded condition was due to ineffective or nonexistent inspection, maintenance, and personnel qualification processes.

Lessons Learned

This accident highlights the importance of preemptive maintenance. Compromised third rail feeder cable can become corroded, reducing its ability to carry the electrical current for which it was designed. In this accident, as the compromised area of cable degraded, the loss of material caused it to become overloaded and ignite. Thorough and well-defined third rail inspections should provide the opportunity to identify compromised conditions in these systems and subsequent investigations and remediations. Further, the use of thermal imagery inspection tools can help identify compromised cables that may be experiencing electrical overloading.

The NTSB released a safety alert in March 2026 encouraging railroads to review and address deficiencies in traction power electrical system procedures and maintenance and to incorporate electrical hazards into system safety programs.

After the accident, PATH developed new procedures for third rail inspections and maintenance and implemented new training and qualification processes for employees engaged in this work. PATH also implemented a new thermal imaging inspection process that, before the publication of this report, identified multiple areas of compromised third rail and power cable, allowing these areas to be remediated before a critical failure.

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 RRD25FR011. 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