



U.S. Department
of Transportation
**Federal Transit
Administration**

SA 16-2

Safety Advisory

MAY 16 2016

Subject: Contact Rail (Third Rail) System Hazards

Purpose: The Federal Transit Administration (FTA) issues *Safety Advisory 16-2* to request information from State Safety Oversight Agencies (SSOAs) regarding the condition and safety performance of contact rail (third rail) traction power electrification (TPE) systems at the Rail Fixed Guideway Public Transportation Systems (RFGPTS) in their jurisdictions. *Safety Advisory 16-2* applies only to SSOAs with RFGPTS using contact rail power distribution systems.

Background: Nationwide, 13 RFGPTS operate and maintain contact rail TPE systems to power trains that move millions of daily passengers in some of the nation's largest cities.¹ The safety performance of contact rail TPE systems can deteriorate with age, inattention, and exposure to environmental conditions, such as water/moisture with contaminating materials. In recent months, FTA has investigated several safety events related to failures of contact rail TPE systems, including:

- Smoke events caused by arcing insulators and traction power cable fires;
- An explosion caused by a flashover on porcelain insulators;
- A high-intensity fire caused by an electrical short circuit that resulted in the total loss of a traction power substation and major service disruptions;
- Damage to electrical propulsion equipment on dozens of railcars caused by spiking voltage that significantly impacted passenger service; and
- Poor track conditions exacerbated by electrolysis and corrosion from stray current, which degraded anchor bolts and fasteners to the point of failure in a tunnel.

The FTA asks that each SSOA with an RFGPTS operating and maintaining a contact rail TPE system examine potential hazards associated with these systems through its hazard management program specified at 49 CFR § 659.31. FTA seeks this information in accordance with its authority to periodically request program information of the SSOAs, at 49 CFR 659.39(d)².

Actions: The FTA asks that SSOAs overseeing RFGPTS with contact rail TPE systems to provide the following information:

- 1) A brief description of the RFGPTS contact rail TPE system and components.
- 2) A brief description regarding any major changes or upgrades to the contact rail TPE system made over the last 10 years and whether the traction power cables were also upgraded.

¹ RFGPTS with contact rail TPE systems, in order of daily ridership, include: New York City Transit, Washington Metropolitan Area Transit Authority, Chicago Transit Authority, Massachusetts Bay Transportation Authority, Bay Area Rapid Transit, Southeastern Pennsylvania Transportation Authority (SEPTA), Metropolitan Atlanta Rapid Transit Authority, Los Angeles County Metropolitan Transportation Authority, Miami-Dade Transit, Maryland Transit Administration, , Puerto Rico Highways and Transportation Authority, Port Authority Transit Corporation, and Greater Cleveland Regional Transit Authority.

² Please note, on March 16, 2016, FTA issued a final rule for State Safety Oversight that will eventually replace the longstanding regulations at 49 CFR Part 659. See, 81 Fed.Reg. 14230-62. SSOAs and RFGPTSs must continue to comply with 49 CFR Part 659, however, until they come into compliance with the new regulations, which have been codified at 49 CFR Part 674.

- 3) A brief description of the RFGPTS preventive maintenance program in place to determine the insulation integrity of traction power feeder cables (i.e., meggering, hipot testing, metering or other testing program). If such a program does not exist, or has been modified or eliminated, please explain in the response.
- 4) The approximate percentage of traction power feeder cables used by the RFGPTS that are low smoke and zero halogen emission cables. Please specify the type and manufacturer.
- 5) A brief description of the construction and installation processes used to manage potential impacts of vibration, friction, rubbing, etc. on traction power cables, and whether protective matting is used for cables lying along the ballast and tunnel invert.
- 6) A listing of any corrective action plans (CAPs) required and approved by the SSOA related to the TPE system since calendar year 2012 and their status, to include both open and closed CAPs.
- 7) A copy of the RFGPTS inspection, testing, and maintenance program manual for its contact rail TPE system.
- 8) The RFGPTS definition of “arcing insulator.”
- 9) The following safety event information for calendar year 2015:
 - a. The total number of times a fire department responded to smoke conditions at the RFGPTS related to the contact rail TPE system;
 - b. The total number of smoke/fire events related to the contact rail TPE system that resulted in evacuations for fire/life safety reasons at the RFGPTS; and
 - c. The total number of fatalities and injuries and the total amount of property damage at the RFGPTS resulting from smoke/fire events related to the contact rail TPE system.
- 10) A description of any hazards, issues, or concerns related to the contact rail TPE system reported to, identified and/or investigated by the SSOA during calendar year 2015.

Please note that enhanced SSO program activities, such as participation in RFGPTS inspections and conducting independent reviews of maintenance records and testing sheets, are eligible expenses as part of the over \$88 million in Federal funding apportioned to the States to strengthen their SSO programs and come into compliance with 49 U.S.C. §5329(e) requirements, as codified by the newly released 49 CFR Part 674.

The completed submittal should be emailed by **90 days of issuance of this advisory** to:

Mr. Sam Shelton

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Office of System Safety/Office of Transit Safety and Oversight
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Sam.Shelton@dot.gov

Contact: Please direct questions regarding this safety advisory to Mr. Sam Shelton at (202) 366-0815 or email: Sam.Shelton@dot.gov.