OPERATIONS IN THE VICINITY OF CATENARY WIRES ON AMTRAK RAILROAD LINES

1. INTRODUCTION

Occasionally fire suppression is delayed by the presence of electricity. Small one-line fires have been allowed to spread to several railroad cars because it has been unsafe to operate, with or without water, in the vicinity of high voltage electricity. Fires in the vicinity of catenary wires, third rail or 480-volt stand-by power connections on the Amtrak railroad lines present such a hazard. As this type of fire expands the situation becomes increasingly dangerous. Catenary wires may separate from their fasteners and come down behaving unpredictably when they contact objects, third rail may not be visible, or 480-volt stand-by power may be supplying a train assumed to be de-energized. A train may be dual powered (electric or diesel). A sudden rupturing of a 2400-gallon diesel fuel tank could be disastrous.

This addendum will address: Definitions, Firefighting Operations, Incident Commander, Communications and Safety.

2. DEFINITIONS

2.1 CATENARY WIRES – Overhead electrical wires delivering approximately 12,000 (12KV) volts of alternating current (AC). These lines retain residual static electricity after the power source has been disconnected. The removal of this residual electricity requires the railroad to have a Class "A" employee (A Man) ground the catenary on the tracks/tunnel circuit where power removal was requested by the Incident Commander (IC).

2.2 PANTOGRAPH – An Electrical Pantograph is a carriage assembly mounted above a locomotive that can be raised or lowered to make electrical contact with a catenary line.

2.3 DUAL POWERED – Locomotives with traction motors that can switch from one power supply to another. These trains use diesel when traveling in rural areas and switch to electric when entering the city.

2.4 GROUNDING STICK – A device that provides an electrical connection from the rail return circuit to the catenary circuit, used to protect personnel, equipment, and property.

2.5 GROUNDING SWITCH – A device that provides an electrical connection from the rail return circuit to the catenary circuit, used to protect personnel, equipment and property.

2.6 VOLTAGE DETECTING DEVICE – A device use by the railroad Class “A” employee (A Man) to detect alternating current (AC) Voltage. When the voltage detecting device is held against the catenary conductor (by means of a long pole), it detects if the catenary conductor is energized or de-energized. This instrument will determine if a power source has been discontinued. It will not detect residual static current.
2.7 CLASS "A" EMPLOYEE (A Man) – An electric traction department employee of the railroad specially trained to work with high voltage.

2.8 480 VOLT STAND-BY POWER – Electrical power supplied to a standing train via a cable supplying 480 volts of AC power to operate the refrigeration, lighting, air conditioning, and any other incidental electrical equipment between runs. "480 VOLT STAND-BY POWER" is another safety hazard. It is a heavy black cable running below the platform between the tracks to the train in Penn Station, New York. The power source for the 480-volt stand-by power is independent of the catenary wires and the third rail. Consequently, the terminology the IC uses should be specific in requesting each power source removed so that no one power source is inadvertently overlooked. The 480-volt stand-by power cable may present a tripping and/or entanglement hazard.

3. FIREFIGHTING OPERATIONS

3.1 Long delays in grounding catenary wires may result in a fire gaining headway. The application of water shall be considered only when the power to the third rail, 480 volt stand-by power, and power to the catenary wires have been shut down. At this point, there is still the possibility that residual static electricity is present in the catenary wires, pantograph and electrical components of the train.

3.2 The application of a fog water stream, after the power has been removed from the catenary wires but before the residual static electricity has been removed by the railroad grounding the catenary wires, shall be guided by the following:

3.2.1 A fog nozzle, in the fog pattern position shall be used from a platform into the train avoiding any contact with the overhead electrical wires and the pantograph connection.

3.2.2 If conditions warrant, a handline using a fog stream can be operated from the adjacent platform directing water at the train's undercarriage, thus controlling fire and/or cooling the diesel fuel tank, maintaining its integrity.

3.2.3 Short bursts of a fog water stream shall be utilized to avoid accumulations of water pooling. Run-off water presents an electrical hazard and officers shall make certain that firefighters are not standing in the path of run-off water.

3.2.4 As noted in the N.F.P.A. Fire Protection Handbook, tests conducted with various water spray nozzles indicate that a minimum distance of four feet (4') should be maintained for voltages from 10,000 volts (10KV) to 30,000 volts (30KV). However, a common sense approach to catenary lines containing approximately 12,000 volts (12KV) is required. All fire teams applying water with hand-held fog nozzles should take advantage of the reach of the fog stream and observe to a minimum approach distance of ten feet (10') to catenary wires.
3.2.5 Position firefighters at each possible point of entry into the affected area to warn all incoming units that the limited application of water at this stage of operations shall not be misconstrued as confirmation of power off or the absence of an electrical hazard.

3.2.6 Firefighters shall be sure to set the nozzle to the desired spray pattern and not the straight stream position before applying water to the train. When opening the nozzle, always divert the stream to a safe area momentarily to visually check that a fog pattern is set properly.

3.2.7 Hose stream should not be directed over the top of a train where pantograph or catenary wires are located.

4. INCIDENT COMMANDER

4.1 The IC shall establish an Incident Command Post (ICP) at the Taxi Ramp entrance to Penn Station.

4.2 A Battalion Chief will respond to the Penn Station Central Control (PSCC) at 400 West 31st Street to assist in communicating vital information to and from the command post.

4.3 Railroad Transportation Supervisor/s will respond to the ICP, report in, and remain there for the duration of the operation to assist the IC. If a railroad supervisor is not stationed at the ICP to assist in coordinating all the activities in this addendum, then the IC may choose not to implement the above procedures and wait for the railroad to place of the grounds prior to the use of any fog stream or water.

4.4 Any decision to move the train involved in the emergency into the station, evacuate the passengers, utilize a rescue train, or the dispatching of a diesel locomotive shall be made by the IC after (if possible) consultation with railroad supervisors.

4.5 Adequate resources shall be mobilized to rendezvous with train evacuees at the nearest suitable location which is usually a station platform. Adequate resources shall include: firefighters with first aid equipment, backboards, stretchers and EMSC units, if smoke has sufficiently dissipated. Officers shall be prepared for a change in strategy or a reversal of train direction by monitoring all communications and maintaining contact with the ICP. The officer supervising the evacuation resources can re-deploy members as required after approval from the ICP.

5. COMMUNICATIONS

5.1 The IC must order via the FDNY dispatcher: the power-off on the third rail, catenary lines and 480 volt stand-by power, and the stopping of all train movement. The power source for the 480-volt stand-by power is independent of the catenary circuit and the third rail. Terminology in communicating power-off request should specify each source so that no one source is inadvertently overlooked.
5.2 When requesting power removal, the following terminology must be stated verbatim to the FDNY dispatcher:

1. Request All Train Movement Stopped (Specify Affected Track(s))
2. Request Third Rail - DC Power Removal (Specify Affected Track(s))
3. Request Catenary - AC Power Removal (Specify Affected Track(s))
4. Request 480 Volt Standby Power Removal (Specify Affected Track(s))

5.3 The FDNY Dispatcher will notify the Railroad Power Director of the IC’s request using the above terminology. This request must be relayed verbatim.

5.4 The Railroad Power Director will confirm to the FDNY dispatcher, that the electrical power source (third rail, catenary wires and 480 Volt stand-by power) has been disconnected from the designated track/tunnel number. The PSCC Supervisor will confirm to the FDNY Dispatcher that train movement has been stopped on the designated tracks.

5.5 The FDNY dispatcher will notify the IC when the power supply has been removed on the requested track/tunnel numbers. Overhead wires will still contain residual energy until grounds are attached.

5.6 At this time a fog water stream may be applied from a safe distance from the platform avoiding overhead wires as guided by Section 3.

Note: Until the IC has confirmation that the power supply has been removed and grounded from the overhead catenary wires, third rail and 480 volt stand-by power and all train movement has been halted, members may not operate on the track areas unless there is imminent peril to life.

5.7 Refer to AUC 207, Addendum 9A for procedures on grounding catenary wires.

5.8 Unless an emergency situation arises and as condition permit, the IC should wait for confirmation of power removal before requesting power-off on additional tracks or tunnels. Requests to remove power from additional tracks or tunnels prior to completion and confirmation of the original request have led to great delays and confusion with communication.

5.9 At the conclusion of operations, the IC should notify the FDNY dispatcher that all Fire Department personnel have been removed from the tracks and that the Fire Department no longer requires the power to be removed or train movement stopped at this location. Determination of when to restore power and train movement shall be made by the railroad after they inspect the site. This communication should be in accordance with AUC 207, Section 4.5, with respect to the proper phrasing of the message.
COMMUNICATIONS NOTE:

Manhattan fire dispatchers have a direct phone line for fires and emergencies at Penn Station. It will ring at the Railroad Power Director (power removal), 400 West 31st Street, Manhattan.

When it is necessary for the FDNY Dispatcher to speak with the PSCC Supervisor, whether to verify that train movement has been stopped, or for any other reason, the Railroad Power Director shall instruct the PSCC Supervisor to pick up the direct line. By picking up the direct line, the PSCC Supervisor will be on the same direct line as the Railroad Power Director and the FDNY dispatcher in a conference call mode. If the PSCC Supervisor is not available, the Railroad Power Director shall instruct the PSCC Supervisor to call the FDNY Dispatcher immediately.

6. SAFETY PROCEDURES

6.1 Hose streams should not be directed over the top of a train in areas where pantograph or catenary electric wires are located.

6.2 The officer in charge of this operation must consider the direction of flow of run-off water and make certain that firefighters are not standing in the water's path. It is more dangerous if firefighters are standing in a puddle and come in contact with live electrical equipment than a dry surface.

6.3 Firefighting teams using hand-held water fog nozzles should take advantage of the reach of the stream and should observe a minimum approach distance to catenary wires of ten feet (10') until grounds are placed by the railroad.

6.4 Depending upon the voltage in overhead wires, the proximity of metal ladders to them, and the quality of the grounds (ladder and electrical circuit), it may not be necessary to actually touch the wires to suffer an electrical shock. Electrical current can arc and jump the distance between the ladder and the wires and cause death to an unsuspecting member. The IC must take this into consideration before allowing metal ladders to be used.

7. CONCLUSION

7.1 The above procedures are not intended to pre-empt any existing safety requirements for operating in the vicinity of high-voltage, transformers, or Con Edison equipment. The procedures outlined in this addendum are intended for Penn Station (including the adjacent under river tunnels) and the railroads which it services, i.e., Long Island R.R., New Jersey Transit and Amtrak, but appropriate sections may be applied to other areas or railroads utilizing catenary wires.