WMSC Commissioner Brief: W-0049 – Fire/Smoke at L’Enfant Plaza Station – February 4, 2020

Prepared for Washington Metrorail Safety Commission meeting on October 20, 2020

Safety event summary:

A train carrying customers was used to investigate a report of smoke on the roadway, in violation of Metrorail procedures.

ATC personnel reported smoke in the L’Enfant Plaza Train Control Room (TCR) at approximately 11:52 a.m. on February 4, 2020. The TCR is located beyond the end gate (in the tunnel) on Track 1 in the direction of the L Line Potomac River Bridge. ATC personnel used a grinder to cut a lock off of a former employee’s locker, which led to sparks falling into computer equipment, igniting a filter inside. The use of the grinder was approved by an assistant superintendent. The lock removal should have been done with a bolt cutter, which was not available to that work crew on site. The supervisor did not have hot-works training, there was no job safety briefing, and there are no work instructions for removing a lock from a locker.

The ATC personnel cut power to the equipment fan and used a fire extinguisher to put out the smoking filter. The crew opened the doors of the TCR, leading to smoke exiting into the tunnel area near the station platform. The smoke alarm in the TCR did not activate. The crew was wearing proper personal protective equipment.

The WMSC conducted an extensive investigation into the response to this incident and train movement following the report of smoke. The key issue identified is inconsistency in information relayed to the MOC desks compared to the ROCC assistant superintendent.

At 11:52 a.m., the on-scene ATC Maintenance Assistant Superintendent notified the MOC via phone that the crew had started a fire and there was smoke in the TCR. The Assistant Superintendent requested fan activation to keep smoke away from the platform and was transferred to the ROCC where the request was made much more calmly. A Metro Transit Police Officer also requested fans on in the station. At 11:55 a.m., the ROCC activated the station exhaust fans. The ATCM assistant superintendent later informed the ROCC that smoke was contained to the TCR.

It is unclear how this information was communicated to the rail traffic controller.

However, the ROCC instructed Train 309 at Gallery Place to perform a track inspection to L’Enfant Plaza without instructing the inspection train to offload prior to proceeding through a reported smoke condition.

That train operator was not told to look for smoke, but just to check for anything unusual.

The train operator reported a good track inspection on Track 2 at 11:59 a.m.

A ROCC Assistant Superintendent claimed that since the ATCM Assistant Superintendent described the smoke as in the TCR, it was not smoke in a station or on the roadway, so the train was allowed to proceed with customers on board.

An RTRA supervisor also later performed a track inspection and did not identify smoke or fire.

D.C. Fire and EMS responded to the station, confirmed that power had been removed and the filter was no longer a threat, and left the scene.
Based on the first-hand information provided over the phone and radios, the movement of Train 309 with customers on board was clearly improper. However, additional trains entered the area only after the clear track inspection from Train 309 and on-scene Metrorail employees.

The movement of Train 309 clearly violated Standard Operating Procedure (SOP) #6 that requires the ROCC to instruct the train operator to offload a train and perform a track inspection in the event of a report of light smoke. No similar track inspection was conducted by a train on Track 1, and the smoke appeared to have cleared from the roadway prior to the next train arriving on Track 1.

ROCC management did not remove those who may have played a role in the incident for post-incident testing.

The Rail Operations Control Center did not conduct its own investigation of the event, and ROCC management supported the use of the test train that was sent through a reported smoke condition.

The ROCC did not follow a lessons learned document Metrorail said was issued following a WMSC finding several months earlier regarding dysfunction in the ROCC during unplanned emergencies that focused on SOP #6. Metrorail also could only provide documentation that this lessons learned document was provided to certain employees.

**Probable Cause:**

A lack of understanding of the safety-critical SOP #6 allowed a train carrying customers to be sent through an area where smoke was reported. The smoke was caused by inadequate training for employees who then used an improper tool in an enclosed space and did not conduct a job safety briefing.

**Corrective Actions:**

ATCM was explicitly barred from doing any work in a train control room that involved sparks emitting from tools, and ATCM personnel are now required to take a hot-works computer-based training (CBT).

As an additional corrective action, WMATA cited a directive issued December 20, 2019 in conjunction with the WMSC’s finding regarding chaos and dysfunction in the ROCC during unplanned emergencies that explicitly barred the use of trains carrying customers to do any type of track inspection.

**WMSC staff observations:**

WMATA’s ROCC corrective action in this event falls short of what is required, however Corrective Action Plan (CAP) proposals from WMATA regarding the 25 ROCC-related findings issued by the WMSC from December 2019 through September 2020 can lead to a significantly improved situation where controllers are permitted by management to follow proper procedures.

Sending a train carrying passengers from an area that is safe through an area where smoke or fire is reported is unsafe and is not something that can be left to discretion.

**Staff recommendation**: Adopt final report.
Executive Summary

On Tuesday, February 4, 2020, at approximately 12:00 hrs., Office of Automatic Train Control Management (ATCM) Assistant Superintendent personnel notified Rail Operations Control Center (ROCC) that smoke was coming from the Train Control Room (TCR) at L’Enfant Plaza (F03) Track 1. ATC personnel were cutting a lock off an employees’ locker using a grinder located in the TCR. Sparks emitted from the grinder and fell into a server equipped with a filter and began to smoke. Emergency Response Team (ERT), District of Columbia Fire Department (DCF), Metro Transit Police Department (MTPD), and SAFE were notified and dispatched to the scene. No injuries or considerable damage were reported as a result of this incident.

Incident Site

L’Enfant Plaza, Track 1

Lower Platform Level, Train Control Room
Field Sketch/ Schematics

Investigation

On Tuesday, approximately noon, ATCM management notified ROCC of a smoke condition at L’Enfant Plaza Station within the TCR. ATCM requested ROCC activate fans to ensure no smoke affected the platform area, as a result of ATCM personnel cutting a lock off a vacant locker Refer to photo 1.

Interviews

Based on the interview, the ATCM Supervisor (ATCM/S) is a 33-year employee with seven (7) years as a supervisor. The ATCM Supervisor stated ATCM Assistant Superintendent authorized and instructed the removal of a padlock installed on a vacant locker within the TCR. While holding the grinder, sparks started to emit. After stopping, the ATCM supervisor stated to ATCM management, which was also located in the TCR at the time of the event, to gather equipment to block the sparks; at this time, sparks hit the “Cisco panel,” and the side filters began to smolder. Refer to photo 2. Thereafter, smoke began to travel from the exhaust fan. As a result, the TCR required ventilation.

Based on the employee’s statement, they reported that the smoke alarm inside the TCR did not activate. Additionally, ROCC verified, there was no alarm activity as a result of the smoke condition. Both ATCM/S and ATCM/AS stated, to prevent a recurrence, a bolt cutter should have been used to reduce hazards. The ATCM/S does not recall taking Hot-works training, which expounds on the application of tools that subsequently produce fire hazards.

Resourced Data

Based on Audio Recording System (ARS) playback, at 11:52 hrs., ATCM Assistant Superintendent [on the scene] contacted MOC via phone to report smoke condition at L’Enfant Plaza Station in the TCR. After the ATCM Assistant Superintendent requesting Fire Department and IT, MOC subsequently transferred the call to ROCC Assistant Superintendent, based on the request for Fan activation. The ATCM Assistant Superintendent then notified ROCC Assistant Superintendent to activate fans to ensure no smoke affected the platform area and provided the location of the event and cause. The Supervisory Control and Data Acquisition (SCADA) Automated Information...
Management System (AIMS) event log revealed Ops 3 Rail Traffic Controller (RTC) activated the L’Enfant Plaza exhaust fans at 11:55 hrs. Further review of audio playback revealed, ATCM Assistant Superintendent stated, the smoke was not affecting the L’Enfant Plaza platform and contained to the TCR.

Ambient audio and Radio communication revealed, the Radio Rail Traffic Controller (RTC) instructed Train ID 309 at Gallery Place to perform a track inspection from Archives to L’Enfant Plaza 2, Track 2 and observe the area for anything unusual and report back. The RTC did not instruct the inspection train to offload passengers prior to sending the train through a reported smoke condition area. Train ID 309 reported at 11:59 hrs., a good track inspection performed with no unusual findings from Archives to L’Enfant Plaza Station, Track 2. ROCC stated, based on statements from the ATCM Assistant Superintendent located at the event location, smoke was not affecting the station. Therefore, a train [with passengers aboard] performed an inspection as instructed.

ATCM Assistant Superintendent notified ROCC Assistant Superintendent, a spark made contact with a COMM server; however, a fire never occurred [only smoke], and the station did not experience a smoke condition. The event was isolated to the TCR; therefore, the event did not affect station operations. RTRA Supervisor arrived on location, performed a track inspection, and did not identify any smoke or fire. Another RTRA supervisor notified ROCC, after further investigation, that no emergency response was required for the event. DCFD arrived on location and deemed the area safe.

Based on a review of Closed Circuit Television (CCTV) playback, the following was determined: DFCFD arrived on location, left the area moments later after determining no emergency present. The Office of Emergency Management personnel remained on location until the event was deemed clear. Video did identify the aforementioned train serviced L’Enfant Plaza after track inspection.

**Automatic Train Control Maintenance**

**Managerial Report**

After investigation, ATCM management determined, ATCM personnel were tasked with removing belongings from a vacant locker secured closed with a padlock. Personnel proceeded to L’Enfant Plaza TCR to remove a personal lock. Upon arrival, it was determined to utilize a grinder (equipped with cutting wheel) to remove the secured lock. A Bolt cutter was not available at the time of lock removal. ATCM/S began cutting the padlock, and within a second of contact, several sparks traveled to nearby COMM equipment. ATCM/S immediately stopped the work [cutting] mitigate [deflect] sparks away from “IT” equipment.

ATC personnel observed a small amount of smoke emitting from a nearby “IT” switch chassis cooling exhaust. The sparks had entered a side vent and ignited the filter inside the chassis. The burning filter was fueled by air being drawn in through a fan and continued to smolder, creating an increasing amount of smoke. Input power was removed
from the chassis to prevent airflow, which stopped the smoke. ATCM personnel extinguished the smoking filter using a Dry-Chemical Fire extinguisher. TCR doors were opened to mitigate smoke condition; however, the smoke that formed within the TCR traveled inside the tunnel area (in the proximity of the platform area). MOC was immediately contacted to report the incident. Upon DCFD arrival, the smoke had dissipated. DCFD personnel performed an inspection and reported no evidence of fire. Thereafter, DCFD deemed the area safe after verifying power was removed, and the burned filter posed no further threat.

COMM concluded, equipment was not affected and replaced the filter. ATCM Management developed and distributed Lessons Learned (ATCM-LL-#2020-002, attachment 1) to the entire ATCM Compliance team and recommended ATCM employees complete the CBT "Hot Work Operator" class.

**Rail Operations Control Center**

There is no investigative report available for review; Based on the review of the event, RTC violated Metrorail Safety Rules and Procedures (MSRPH) Fire and Smoke on the Roadway Standard Operating Procedure (SOP) #6 section 6.5.2.6, “If there is a report of light smoke, ROCC shall instruct the Train Operator to offload the train and perform track inspection(s) of the affected area, via an inspection train, clear of customers, if conditions safely permit.”

Based on an interview with ROCC management, the “test” train was used as a precautionary measure after MTPD, and the RTRA supervisor reported no smoke condition within the platform limits. ROCC did distribute a Lessons Learned on December 20, 2019, expounding on Fire and Smoke Events on the Roadway SOP #6; however, personnel did not follow emphasized rules and procedures outlined in the MSRPH. Refer to Attachment 2 pages 1-3.

**Advanced Information Management System**

Based on AIMS playback, no other trains serviced Track #1 L’Enfant Plaza Station after ATCM smoke event notification; however, Train ID 309 did perform a track inspection with passengers aboard. Additionally, trains did follow in tandem after good track inspection was reported and serviced the station.

**Fire Life Safety Device**

Based on all the facts gathered, it is most probable; the alarm did not activate as a result of ATCM opening the TCR door as mitigation, ROCC exhaust fan activation, and disengaging the cooling fan equipped with the affected filter, which subsequently acted as a fuel source for the smoke condition.
Findings

- ATCM/S used a grinder to cut a padlock off a vacant locker
- ATCM/S did not have Hot-works training
- ATCM did not use bolt cutters to remove installed padlock
- Safety briefing not conducted prior to performing the job
- There are no work instructions available to perform a specific job
- ROCC did not instruct the Train Operator to offload customers before performing a track inspection through a reported smoke-filled area.

Weather

At the time of the incident, the temperature was 37°F, and SAFE has concluded that weather was not a contributing factor in this incident (Weather source: National Oceanic Atmospheric Administration (NOAA) – Location: Washington, DC.)

Human Factors

Post Incident Toxicology Testing

At the time of this incident, ROCC managerial staff and ATCM did not remove any ROCC staff for post-incident testing. Based on SAFE’s investigative findings and Metro’s drug and alcohol policy, ROCC managerial staff should have removed ROCC personnel from service for post-incident testing. Under WMATA’s current Drug and Alcohol Policy and Testing Program Policy Instruction 7.7.3/5 Post-Incident Testing may be performed on employees and contractors whose performance cannot be “completely discounted,”

Fatigue

Based on SAFE’s review of the ATCM personnel 30-day work history, it was determined hours of service were per WMATA’s Risk Management and Fatigue Policy 10.6 and Hours of Service Limitations for Prevention of Fatigue Policy 10.7.

Conclusion

Based on salient facts as part of this investigation, ARS, CCTV, interviews, and SCADA data, SAFE concludes, ATCM personnel performed work within a TCR using a grinder tool with a cutting wheel rather than a bolt cutter. Sparks emitted from the grinder tool and contacted the “IT” switch chassis cooling exhaust filter within the equipment, causing a smoke condition in the TCR outside of L’Enfant Plaza station’s platform limits.

Additionally, the ATCM/S did not receive Hot works training and should not have been operating a grinder in the affected area. The ATCM Assistant Superintendent authorized the use of a grinder and did not perform a safety briefing prior to performing work to
identify hazardous tasks associated with using grinders and Hot Works program processes. These actions subsequently resulted in a smoke event outside L'Enfant Plaza Station's platform limits.

SAFE further determined ROCC allowed a train with customers aboard to move through a reported smoke condition area to perform a track inspection without instructing the Train Operator to offload customers. This action violated SOP 6.5.2.6 that states in part, “If there is a report of light smoke, ROCC shall instruct the Train Operator to offload the train and perform track inspection(s) of the affected area, via an inspection train, clear of customers, if conditions safely permit.”

**Immediate Mitigation to Prevent Recurrence**

- ATCM developed a Lessons Learned (ATCM-LL-#2020-002) with an emphasis on working in enclosed areas (TCR) with improper tools (see attachment 1).
- ATCM re-instructed personnel with an emphasis on proper job-site planning/briefing.

**SAFE Recommendations**

SAFE recommends ROCC revise procedures for Fire and Smoke conditions expounding on actions taken by ROCC and Train Operators during events and redistribute Lessons Learned associated with SOP #6 requirements for Fire and Smoke Events.

**Corrective Action**

1. ATCM shall not perform any work within a TCR resulting in sparks emitting from tool use
2. ATCM will attend Hot-Works Computer Based Training (CBT).
3. ROCC previously issued a directive prohibiting the use of revenue trains to conduct any type of track inspections with Customers Aboard (see attachment 2 pages 1-3).
“It only takes a small spark”

INCIDENT SUMMARY

ATCM management were instructed to remove a padlock from an ex-employee's personal locker. Bolt cutters were unavailable and decision was made to utilized nearby grinder. The grinder was equipped with a cutting wheel. First few seconds of cutting padlock sparks flew. Supervisor immediately stopped the work (cutting) so that sparks could be deflected away from "IT" equipment. ATC personnel observed a small amount of smoke emitting from a nearby "IT" switch chassis cooling exhaust. The sparks had entered a side vent and ignited the filter inside the chassis. The burning filter was fueled by air being drawn in through a fan, and continued to smolder creating an increasing amount of smoke. Input power was removed from the chassis to prevent air flow which stopped the smoke. The filter was extinguished through use of Dry-Chemical Fire extinguisher. However significant smoke had formed within the TCR and was traveling into the tunnel. MDC was immediately contacted to report the incident. DCFD responded and deemed the area safe after verifying power was removed and the burned filter posed no further threat. SAFE, COMA, and AT personnel responded, and fortunately, no damage was found within the affected chases. The burned filter was replaced and IT's equipment was returned to service.

Findings

- Poor planning. Proper tools not located before beginning of task
- Task of metal grinding conducted too close to electronic equipment
- Personnel had required PPE
- Personnel immediately stopped work when conditions changed (appearance of smoke)
- All appropriate personnel (ROCC, MOC, SAFE,) were notified

Recommendations

- NSRPH 1.53 Employee shall exercise care in the use of electronic property and resources and shall make every effort to prevent damage or misuse
- NSRPH 1.54 Employee shall not willfully destroy or, through neglect, indifference or misuse, cause loss of or damage to electronic property, customer's property or fellow employee's property
- NSRPH 4.7 Employee shall submit a written report of all fires to the Department of Safety
- NSRPH 4.5 Safely goggles or safety glasses should be worn for all grinding, sanding, drilling, chipping or hammering operations, and when using wood or metal working equipment
- NSRPH 4.85 Employee shall use tools and equipment in the proper manner and for the purpose intended.

Attachment 1 – ATCM Lessons Learned
Attachment 2 - December 20, 2019, Event Lessons Learned page 1 of 3
RECOMMENDATIONS
- OCC should have offloaded the test train prior to authorizing the inspection
- Once SOP 1A is enacted, the request to restore third rail power must be given from the OSC
- Two controllers must confirm power breakers prior to third rail power restoration
- Power restoration announcements must be made on all ops

APPENDIX
Smoke and Fire on the Roadway SOP #6
The Purpose of this Standard Operating Procedure is to define responsibilities and procedures for WMATA personnel in the event of fire and smoke being reported on the roadway.

6.5.2.6 If there is a report of light smoke, ROCC shall instruct the Train Operator to unload the train and perform track inspection(s) of the affected area, via an inspection train, clear of customers, if conditions permit.

Command Control and Coordination of Emergencies on the Rail System SOP #1A
1A.5.1.1 The Role/Duties of the IC - The IC shall control and coordinate all activities of the emergency. The following is a possible list of incident commanders at an WMATA incident or event:
- Local Fire Department
- Local or Federal Law Enforcement agencies

Emergency Removal and Restoration of Third Rail Power Mainline SOP #2
2.5.5.6 The ROCC Supervisor is the only person authorized to restore third rail power.
2.5.6 Restoration of Third Rail Power on Mainline (Short Duration Emergency):
2.5.6.1 Upon receiving a request from an authorized person and being assured that equipment and personnel are in the clear and that all personnel have been informed

that power is to be restored, the ROCC Supervisor shall restore the third rail power by supervisory control from the Rail Operations Control Center in the following manner:

2.5.6.1.1 Two ROCC Supervisors shall be involved. One shall operate the Traction Power Console and the other shall observe the traction power diagram on the Traction Power Cathode Ray Tube (CRT).

2.5.6.1.2 The ROCC Supervisor operating the Traction Power Console shall say, “I am restoring power to track(s) number(s) and I am restoring circuit breaker number(s).”

2.5.6.2 The ROCC Supervisor observing the Traction Power CRT shall listen attentively and observe the display to verify that the appropriate circuit breaker(s) have been restored. If the supervisor making the observation does not hear the words or if the console operator is about to close an incorrect breaker, the operation shall be stopped until both agree that the appropriate breaker(s) are being restored.
 Confirmation of Receipt
SOP #6 Lessons Learned

I acknowledge receipt and will comply with the policy(s)/instruction(s). I understand it is my responsibility to familiarize myself with the contents of this document.

Employee Name - Please Print

Employee Signature - Electronic Signature Accepted

Payroll Number

Date: 12-21-2019

Date

Cc: Employee File

Attachment 2 - December 20, 2019, Event Lessons Learned page 3 of 3
Photos

Photo 1 – Lock requiring removal
Photo 2 – Affected Cisco COMM component