



WMSC Commissioner Brief: W-0178 – Evacuation for Life-Safety Reasons – Pentagon City Station – April 13, 2022

Prepared for Washington Metrorail Safety Commission meeting on August 9, 2022

Safety event summary:

Metrorail personnel observed what appeared to be smoke coming from Train 306 in Pentagon City Station at 10:04 p.m. on April 13, 2022 and then in the station or tunnel area, but did not evacuate the station or stop the train where smoke was reported as required by Metrorail safety procedures. The Yellow Line train continued in service to the end of the line at Greenbelt Station. Metrorail also did not evacuate the station when the Station Manager requested permission for such an evacuation at 10:17 p.m. The Station Manager's communication was not acknowledged, and the Station Manager did not repeat the request. Metrorail did stop train traffic in the area as required by procedure and offloaded two trains for the safety of passengers before the trains were used to perform track inspections.

At 10:04 p.m., a Train Operator reported observing smoke coming from a train (Train 306) on the opposite track at Pentagon City Station. Train 306 continued northbound.

At 10:08 p.m., a Rail Supervisor at Pentagon City Station reported smoke in the tunnel toward Reagan National Airport. Ventilation fans were activated by ROCC. The Station Manager reported seeing smoke at 10:11 p.m.

A Rail Supervisor reported at 10:21 p.m. that Pentagon City Station was "a little cloudy." At 10:22 p.m., the Arlington County Fire Department arrived. At 10:23 p.m., the Station Manager requested a station evacuation. The ROCC declined that request.

Despite the arrival of the fire department, the Rail Supervisor reported at 10:28 p.m. that the area was safe for train movement, and the Rail Operations Control Center instructed a train to go back into service at Crystal City at 10:30 p.m. The fire department was not reported to have declared the scene clear of fire or smoke until 10:34 p.m.

The investigation determined the source of the apparent smoke was a rider activating a WMATA fire extinguisher inside railcar 2025 (part of Train 306) as Train 306 departed Pentagon City Station toward Pentagon Station. At the end of the line at Greenbelt Station, the Train Operator saw that the fire extinguisher was missing and the operator's cab on railcar 2025 was damaged. The Train Operator reported this to the Terminal Supervisor.

Probable Cause:

The probable cause of this event was a Metrorail rider improperly discharging a fire extinguisher. The probable cause of Metrorail's improper response to a report of smoke is Metrorail's culture of noncompliance with written operational rules, procedures and manuals.

WMSC staff observations:

At no point during this event did Metrorail know the source of the smoke, however Metrorail personnel treated the reported smoke as insignificant rather than a potential risk to riders and personnel in the station or on the train in question. Metrorail should ensure that when smoke is reported coming from a specific train, more than a cursory radio communication is made to ensure that the train is operating safely.



Washington Metro Area Transit Authority
Department of Safety and Environmental
Management (SAFE)
FINAL REPORT OF INVESTIGATION A&I

Date of Event:	April 13, 2022
Type of Event:	Evacuation for Life Safety Reasons – (Fire/Smoke)
Incident Time:	22:04 Hours
Location:	Pentagon City Station, Track 1
Time and how received by SAFE:	22:11 Hours – Mission Assurance Coordinator (MAC)
WMSC Notification Time:	23:45 Hours
Responding Safety Officers:	WMATA: N/A WMSC: N/A Other: N/A
Rail Vehicle:	Train 306 (L2024/25x2073/72x3166/67T)
Injuries:	None
Damage:	None
Emergency Responders:	Arlington County Fire Department
SMS (Safety Management System) I/A Number	20220414#99607MX

Table of Contents

Abbreviations and Acronyms-----	3
Executive Summary -----	4
Incident Site -----	5
Field Sketch/Schematics-----	5
Purpose and Scope -----	5
Investigative Methods-----	5
Investigation -----	7
Chronological ARS Timeline -----	10
Related Policies and Procedures -----	12
Advanced Information Management System (AIMS) -----	12
Interview Findings-----	12
Virtual Interview Summary of the Rail Supervisor: -----	13
Weather -----	13
Human Factors -----	13
Fatigue Risk -----	13
Post-Incident Toxicology Testing -----	13
Findings -----	13
SAFE Recommendations/Corrective Actions-----	14
Appendices -----	15
Appendix A – Interview Summary -----	15
Appendix B – Total Cost (RQAW) -----	16
Appendix C - Root Cause Analysis-----	17

Abbreviations and Acronyms

AIMS	Advanced Information Management System
AOM	Assistant Operations Manager
ARS	Audio Recording System
CAP	Corrective Action Plan
CCTV	Closed-Circuit Television
MSRPH	Metrorail Safety Rules and Procedures Handbook
MTPD	Metro Transit Police Department
NOAA	National Oceanic and Atmospheric Administration
OM	Operations Manager
RQAW	Railcar Quality Assurance and Warranty Compliance
RTC	Rail Traffic Controller
RTRA	Office of Rail Transportation
ROCC	Rail Operations Control Center
SAFE	Department of Safety and Environmental Management
SMS	Safety Measurement System
WMATA	Washington Metropolitan Area Transit Authority
WMSC	Washington Metrorail Safety Commission

Washington Metropolitan Area Transit Authority
Department of Safety & Environmental Management

Executive Summary

On Wednesday, April 13, 2022, at approximately 22:04 hours, the Train Operator of Train ID 302 located at Pentagon City Station, Track 2, contacted the Rail Operations Central Control (ROCC) Radio Rail Traffic Controller (RTC) and reported observing a white, smoke-like substance coming from Train 306, at Pentagon City Station, Track 1.

A review of the Audio Recording System (ARS) playback revealed that the RTC began coordinating passenger offloads by having Trains 404 and 407 alight passengers prior to arriving at Pentagon City Station at approximately 22:10 hours.

At approximately 22:11 hours, a Rail Supervisor reported on scene and subsequently requested a track inspection. ROCC then ordered Train 402 to alight passengers and allow the Rail Supervisor to conduct a track inspection.

At approximately 22:12 hours, Train 404 was instructed to alight passengers at Ronald Reagan National Airport Station, Track 1 to perform a track inspection. Train 407 was instructed to alight all passengers at Arlington Cemetery, Track 2 for the same purpose. At approximately 22:13 hours, the ventilation fans were activated inside the tunnel of Pentagon City Station.

At approximately 22:17 hours, the Rail Supervisor continued the track inspection onboard Train 402. The Station Manager requested permission to evacuate Pentagon City Station, however the request was not acknowledged and the station was not evacuated.

At this time, Train 407 was re-blocked to Train 707 in the direction of Franconia Springfield and Train 404 was re-blocked to Train 704. Both trains commenced inspection of their respective tracks through the area of Pentagon City station.

Between 22:20 and 22:21 hours, the Rail Supervisor reported a good track inspection between National Airport Station, Crystal City Station and Pentagon City Station, however, did report that Pentagon City Station was "a little cloudy."

At approximately 22:22 hours, Arlington County Fire Department arrived on scene. At the same time, the haze was reported as clearing from Pentagon City Station by the Station Manager.

At approximately 22:24 hours, the Rail Supervisor reported a good track inspection between Pentagon City Station and Crystal City Station. At approximately 22:28 hours, the Rail Supervisor advised that the area was safe for train movement.

By approximately 22:29 hours, both Trains 707 and 704 reported good track inspections between Pentagon City and Crystal City, Tracks 1 and 2, respectively.

At approximately 22:30 hours, Train 704 was reassigned as Train 404 and instructed to return to service at Crystal City, Track 2.

- Formal Interviews – SAFE interviewed one individual as part of this investigation. The interview included a person present at, during, and after the incident, and representatives from the WMSC. SAFE interviewed the following individual:
 - Rail Supervisor
- Documentation Review – Collection of relevant work history information and process documentation contained in WMATA systems of record. These records include:
 - Metrorail Safety Rules and Procedures Handbook (MSRPH)
 - National Oceanic Atmospheric Administration (NOAA)
 - Rail Operations Control Center (ROCC) Incident Report
- System Data Recording Review – Collection of information contained in Metro Data Recording Systems. This data includes:
 - ARS (Audio Recording System) playback [Radio and Landline Communications]
 - Closed-Circuit Television (CCTV)

Investigation

On Wednesday, April 13, 2022, at approximately 22:04 hours, Train 302 observed and reported a white, smoke-like substance coming from the rear of Train 306, at Pentagon City Station, Track 1, to the RTC over the radio.

Upon receiving the report, the ROCC AOM, ROIC, SAFE, OM, MTPD, PLNT and other concerned personnel were notified. A review of the CCTV playback around the time of the report revealed a puff of white smoke emanating from Train 306, Car 2025. Later investigation identified the source of the smoke as a fire extinguisher discharged in between the rail cars.



Figure 1: Train 306, Car 2025 after alighting passengers, just prior to departing towards Pentagon Station, Track 1, from Pentagon City Station.



Figure 2: Train 302 departing Pentagon Station on opposite track. view obstructed by Train 306. A cloud of white smoke visible between cars 2025 and 2073.

The ARS playback and the ROIC report revealed the Station Manager observed no smoke in the Station, however, they could observe smoke in the tunnel, towards Crystal City. This was likely due to the departure of Train ID 302, pulling the fire extinguisher discharge towards portal. Both the Station Manager and Train Operator of Train 306 did not detect an odor consistent with hot brakes, electrical or regular combustible events.

As the source of the smoke was unknown at the time, the RTC began coordinating track inspections by Trains 404 and 407, alighting passengers prior to arriving at Pentagon City Station. Further, RTC coordinated ventilating Pentagon City Station using tunnel fans.

At approximately 22:11 hours, a Rail Supervisor reported on scene and subsequently requested to perform a track inspection from Pentagon City Station. ROCC then ordered Train 402 to alight passengers and allow the Rail Supervisor to conduct a track inspection.

At approximately 22:12 hours, Train 404 was instructed to alight passengers at Ronald Reagan National Airport Station to perform a track inspection. Train 407 was instructed to alight all passengers at Arlington Cemetery, Track 2 for the same purpose. At approximately 22:13 hours, the ventilation fans were activated inside the tunnel of Pentagon City Station.

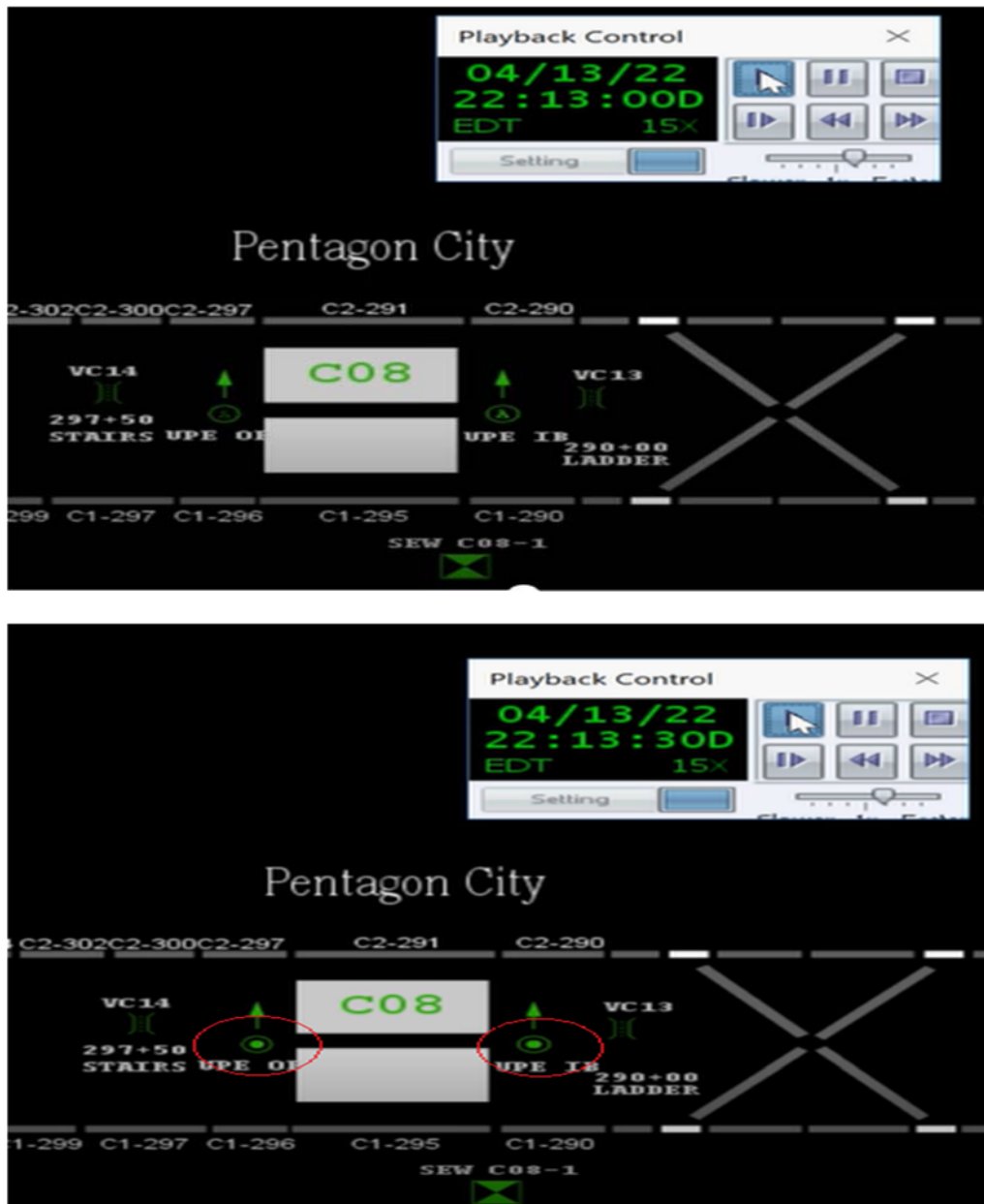


Figure 3: AIMS Playback indicating Fan activation at approximately 22:13 hours.

At approximately 22:17 hours, the Rail Supervisor continued the track inspection onboard Train 402 and the Station Manager made their first inquiry for permission to evacuate Pentagon City Station. The ROCC did not acknowledge the request and the Station Manager did not repeat the inquiry at the time.

At this time, Train 407 was re-blocked to Train 707 in the direction of Franconia Springfield and Train 404 was re-blocked to Train 704. Both trains commenced inspection of their respective tracks through the area of Pentagon City station.

At approximately 22:19 hours, the Rail Supervisor was advised by ROCC that they were the on-scene commander. Between 22:20 and 22:21 hours, the Rail Supervisor reported a good track

inspection between National Airport Station, Crystal City Station and Pentagon City Station, however, did report that Pentagon City Station was “a little cloudy.”

At approximately 22:22 hours, Arlington County Fire Department arrived on scene as the smoke was reported to begin clearing from Pentagon City Station, by the Station Manager. The Station Manager then inquired whether an evacuation was necessary to evacuate Pentagon City Station, a second time. The ROCC declined to evacuate the station at the time.

At approximately 22:24, the Rail Supervisor reported a good track inspection between Pentagon City Station and Crystal City Station. At the same time, Arlington Fire Department reported they had been set up as the command post for the incident. At approximately 22:28 hours, the Rail Supervisor advised tracks safe for train movement.

By 22:29, both Trains 707 and 704 reported good track inspections between Pentagon City and Crystal City, Tracks 1 and 2, respectively.

At 22:30 hours, Train 704 was again designated as Train 404 and was instructed to return to service Crystal City Track 2.

At approximately 22:34 hours, the Arlington Fire Department declared the scene clear at Pentagon City Station. At the same time, Train 707 was again designated as Train 407 and was instructed to return to service Crystal City Track 1.

At approximately 22:49 hours, Train 306 pulled into Greenbelt Station. The Train Operator performed a check of the train and determined that the fire extinguisher from the Operator's Cab of Car 2025 was missing and the entry to the Operator's Cab was damaged. The MTPD After-Action Report stipulates no one was detained, placed in custody or arrested in relation to the incident. The fire extinguisher was not recovered. The Railcar Quality Assurance and Warranty Compliance (RQAW) reported the total cost of repairs, parts, labor was \$199.77.

Chronological ARS Timeline

A review of ARS playback, i.e., phone and radio communications, revealed the following timeline:

Time	Description
22:04:56 Hours	Train ID 302 track 2 Pentagon City Station reported that they observed smoke from the train on track 1. ROCC RTC acknowledged. [Radio]
22:06:38 Hours	RTC contacted Train 306 and inquired if the train had a brake odor. Train 306 reported no brake odor.
22:08:25 Hours	The Rail Supervisor reported to the RTC no smoke in the station, smoke is seen in the tunnel towards National Airport, no odor. [Phone]
22:10:37 Hours	RTC instructed Train 404 and 407 to offload. [Radio]
22:10:51 Hours	RTC to MOC requested fans activated at Pentagon City Station. [Phone]
22:11:19 Hours	ROIC instructed the Station Manager to check for smoke in the station. The Station Manager reported seeing some smoke and that the Rail Supervisor was on the scene. [Radio]
22:11:54 Hours	ROCC acknowledged the Rail Supervisor on scene investigating. [Radio]

Time	Description
22:12:07 Hours	Rail Supervisor requested to perform a track inspection. ROCC advised that Train 402, track 2 Pentagon Station to offload for a track inspection. [Radio]
22:12:20 Hours	Rail Supervisor boarded Train ID 402 to perform a track inspection. Train 404, track 1 at National Airport Station was instructed to offload.
22:13:17 Hours	The Station Manager reported that the last train that departed left smoke and that the smoke was visible on Track 1 only. [Radio]
22:17:36 Hours	Train 404 (704) departed National Airport Station to perform a track inspection. [Radio]
22:17:47 Hours	The Station Manager requested permission to evacuate Pentagon City Station. *Note: The transmission was not acknowledged or repeated. [Radio]
22:19:33 Hours	ROCC advised the Rail Supervisor that they were the On-Scene Commander. [Radio]
22:20:55 Hours	Train 704 reported a good track inspection between National Airport Station and Crystal City Station, Track 2. [Radio]
22:21:24 Hours	Rail Supervisor reported a good track inspection between Pentagon City Station and Crystal City Station, Track 2. Pentagon City Station was "a little cloudy." [Radio]
22:22:43 Hours	The Station Manager reported that the smoke was clearing, and the Fire Department was on the scene. [Radio]
22:23:08 Hours	The Station Manager requested the station to evacuate. ROCC declined the request. [Radio] *Note: Track inspections were found to be clear and smoke was reported to be dissipating approximately one minute earlier.
22:24:39 Hours	Rail Supervisor reported a good track inspection between Pentagon City Station and Crystal City Station, Track 2 then the Rail Supervisor boarded the train on track 1 to perform a track inspection. [Radio]
22:26:22 Hours	The Station Manager reported that there was no odor, just residue from smoke on track 2 only. [Radio]
22:28:04 Hours	Rail Supervisor reported exiting train at Pentagon City Station and a good track inspection on tracks 1 & 2. The Rail Supervisor advised the area was safe for train movement. [Radio]
22:34:00 Hours	Rail Supervisor reported that the Fire Department was clear at Pentagon City Station. [Phone]
22:49:25 Hours	Train Operator Train 306 to Terminal Supervisor Greenbelt Station, Fire Extinguisher from rear of Car 2025 housing destroyed, and fire extinguisher missing. [Ambient]

***Note: Times above may vary from other system's timelines based on clock settings and reporting source.*

Related Policies and Procedures

- SOP 1A: Command, Control and Coordination of Emergencies on the Rail System
- SOP #6, #7 and #8: Fire and Smoke on the Metrorail

Advanced Information Management System (AIMS)

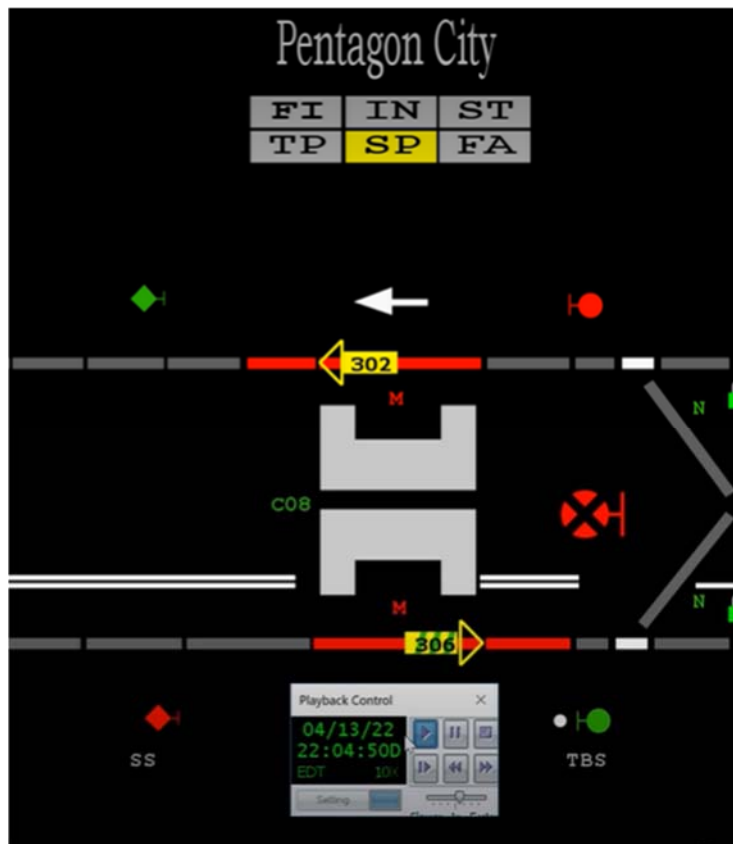


Figure 4: AIMS Playback incident train ID 306 servicing Pentagon City Station at approximately 22:04 hours.

Interview Findings

As part of the investigation launched into the Evacuation for Life Safety Reasons (Fire/Smoke) event, SAFE conducted one interview via Microsoft Teams, including the Investigations Team and the WMSC. The interview was conducted nine days after the event and identified the following key findings associated with this event. Findings detailed below include reported information from interviews and written statements that may conflict with other data sources contained in the report.

Virtual Interview Summary of the Rail Supervisor:

- No injuries were reported as a result of the incident.
- There was a delay of approximately 24 minutes to service as a result of the incident.
- The Rail Supervisor stated by the time they arrived on scene, the smoke in question had mostly dissipated. They also stated they did not smell any odors that would cause alarm, based on training and experience.
- The Rail Supervisor stated the ROCC did not issue directions for the station to evacuate. The Rail Supervisor stated that they agreed with this decision from ROCC.

Weather

On April 13, 2022, at the time of the incident, NOAA recorded the temperature as 69° F, and some sky cover with an average of 58% humidity and an average windspeed of 9.5 MPH. This event occurred within a tunneled section of the rail system. Weather was not a contributing factor in this event (Weather source: NOAA – Location: Arlington, VA).

Human Factors

Fatigue Risk

WMATA personnel were not identified as contributory in this event. The biomathematical fatigue modeling application (SAFTE-FAST Web SFC) was not applied for this event.

Post-Incident Toxicology Testing

WMATA personnel were not identified as contributory in this event. Post-Incident Toxicology Testing was not conducted.

Findings

- A customer aboard Train ID 306 acquired a fire extinguisher, from inside rail car 2025, and discharged the fire extinguisher outside of the rail car, causing white smoke to temporarily fill Pentagon City Station. Responding WMATA personnel reported no smell of smoke or brake odor.
- Initial reporting suggested that the smoke point of origin was towards the southern end of the station, towards Crystal City Station, and the investigation of the smoke commenced from Crystal City Station.
- The fire extinguisher was missing, and the housing destroyed resulting in \$199.77 cost in repairs, labor and materials.
- There was an approximately 24-minute delay in revenue service.
- The Station Manager requested permission to evacuate the station, however it was denied based on how quickly the reported smoke was dissipating and the nature of the smoke, such as no odor.
- No WMATA personnel or customers were harmed as a result of this incident.
- No procedural non-compliance were identified.

Immediate Mitigation to Prevent Recurrence

Due to the criminal nature and intent of the suspect, SAFE has no further mitigation and prevention recommendations. The fire extinguisher was secured properly and the involved person took considerable action to access its storage location.

Probable Cause Statement

The probable cause of the Evacuation for Fire Life Safety Reasons (Fire/Smoke) event was a criminal action by a passenger to break into the fire extinguisher compartment and discharge it through the emergency (bulkhead) door from inside Car 2025, as Train 306 departed from Pentagon City Station towards Pentagon Station on Track 1.

SAFE Recommendations/Corrective Actions

Based on the root cause being the theft and inappropriate discharge of the fire extinguisher by an unknown passenger, SAFE does not have any recommendations or corrective actions for this event.

Appendices

Appendix A – Interview Summary

RTRA Rail Supervisor:

The Rail Supervisor is a WMATA employee with 12 years of service and 5 months of experience as a Rail Supervisor. The Rail Supervisor holds a Roadway Worker Protection (RWP) Level 2 certification that expires in May 2022.

During the virtual interview the Rail Supervisor stated that they had been working in the capacity of Rail Supervisor for approximately 5 months in the Utility Program. The Rail Supervisor stated that they had originally heard the report of smoke observed, in the tunnel, at Pentagon City Station over the radio from one of the train operators.

The Rail Supervisor stated that they conducted an initial inspection of tracks 1 and 2 at Pentagon City Station, observing from the platform. The Rail Supervisor then stated that they were instructed, by ROCC, to conduct a track inspection of both tracks, between Pentagon City Station and Crystal City Station. The Rail Supervisor then stated that they heard the RTC instruct Train ID 404 to alight their passengers at Ronald Regan National Airport Station, Track 1.

The Rail Supervisor stated that after boarding the train, they conducted the track inspection, both tracks between Pentagon City Station and Crystal City Station. The Rail Supervisor stated they did not observe any problems with either track.

The Rail Supervisor stated that by the time they returned to Pentagon City Station, the smoke in question had mostly dissipated. The Rail Supervisor also stated that they did not smell any odors that would cause alarm, based on their training and experience.

The Rail Supervisor stated the RTC did not issue directions for any of the stations to evacuate. The Rail Supervisor stated that they agreed with the decision.

Appendix B – Total Cost (RQAW)

Shop:	Alexandria								
Prepared by	T. Clark								
Rate:	\$76.00								
Car(s)	Defect	Part	Cost each	Items	Total Parts	Hours	Rate	Total Labor	Total Cost
2025	Customer used fire extinguisher out of operator's cab.	EXTINGUISHER:FIRE, ABC DRY CHEMICAL	\$47.77	1	\$47.77	2	\$76.00	\$152.00	\$199.77
2024/25	Non-Revenue	Out-of-Service (OOS)	\$0.00	0	\$0.00	4	\$375.00	\$1,500.00	\$1,500.00
			\$0.00	0	\$0.00	0	\$76.00	\$0.00	\$0.00
			\$0.00	0	\$0.00	0	\$76.00	\$0.00	\$0.00
			\$0.00	0	\$0.00	0	\$76.00	\$0.00	\$0.00
			\$0.00	0	\$0.00	0	\$76.00	\$0.00	\$0.00
			\$0.00	0	\$0.00	0	\$76.00	\$0.00	\$0.00
			\$0.00	0	\$0.00	0	\$76.00	\$0.00	\$0.00
			\$0.00	0	\$0.00	0	\$76.00	\$0.00	\$0.00
			\$0.00	0	\$0.00	0	\$76.00	\$0.00	\$0.00
			\$0.00	0	\$0.00	0	\$76.00	\$0.00	\$0.00
			\$0.00	0	\$0.00	0	\$76.00	\$0.00	\$0.00
			\$0.00	0	\$0.00	0	\$76.00	\$0.00	\$0.00
Recovery			\$0.00	0	\$0.00	0	\$76.00	\$0.00	\$0.00
Totals					\$47.77	6		\$1,652.00	\$1,699.77
* NOTE: For each hour the vehicle is OOS from making revenue the charge rate applied is 375.00 dollars per hour									

Incident Date: 04/13/2022 Time: 22:04 hours
 Final Report – Evacuation for Life Safety Reasons
 E22223

Drafted By: SAFE 705 – 06/09/2022
 Reviewed By: SAFE 71 – 06/07/2022
 Approved By: SAFE 71 – 07/21/2022

Problem Statement	Major Cause	Causes	Causes	Root Causes
Revenue Delay of 24 minutes	Smoke-like haze observed in Pentagon City Station	Smoke dissipated quickly establishing fire as a point of origin unlikely. Also, smoke reported as lacking smell profile of fire	Fire extinguisher from the rear of Car 2025 determined to be missing. Retention housing for fire extinguisher damaged.	Missing fire extinguisher taken and discharged in Pentagon Station. Unknown suspect.

Why?

Why?

Why?

Why?

RC-1