



WMSC Commissioner Brief: W-0245 – Evacuation for Life Safety Reasons at Crystal City Station – March 16, 2023

Prepared for Washington Metrorail Safety Commission meeting on October 24, 2023

Safety event summary:

Crystal City Station was evacuated for life safety reasons on March 16, 2023 at 8:49 p.m. due to smoke coming from an escalator. The investigation determined this smoke was due to a shifted drive system and accumulated dirt and grease in this unit, which is at the end of its useful life.

Escalator X05, one of three escalators that carry riders between the Mezzanine (faregates) level and the Crystal City Shops level (the level just below street level with direct entrances to the underground shops and corridors), began emitting smoke. This triggered a fire alarm received by the Metro Transit Police Department (MTPD), the Rail Operations Control Center, and the Station Manager's kiosk display at approximately 8:53 p.m.

The Station Manager found smoke coming from Escalator X05. Both that escalator and the adjacent unit, Escalator X06, both shut down automatically as designed. The Station Manager manually shut off Escalator X04. The Station Manager then retrieved a fire extinguisher and returned to the escalators. The fire extinguisher was not needed, as the escalator's deluge system had activated after the fire started.

At 8:54 p.m., personnel in the Rail Operations Information Center requested an emergency response from the Arlington County Fire Department (ACFD). Units arrived at the station at 8:56 pm.

At 8:59 p.m., the station was closed, and trains began bypassing the station due to the smoke at the station entrance. ROCC personnel notified MTPD and the Office of Elevators and Escalators (ELES).

At 9:01 pm, the Radio Rail Traffic Controller instructed Train ID 459 to stop at Crystal City Station to allow two customers already on the platform to board. The operator was instructed to key the customers on. This means that the operator only opens one specific door that they are present at to ensure the necessary individuals board but that no one else inadvertently exits the train.

At 9:16 p.m., Arlington County Fire Department personnel used fans near the bottom of the escalators to help ventilate the area. The escalator no longer appeared to be creating new smoke after the escalator was shut down. The sprinkler deluge system had helped extinguish the fire. The fire department departed after Metrorail Office of Elevator and Escalator (ELES) personnel arrived.

ELES determined that the escalator's drive system had shifted causing contact with the main drive sprocket and step tracks. ELES personnel reported visible fire damage and the presence of accumulated dirt and grease. Escalator X05 was removed from service for heavy repair. The unit is at the end of its useful life. It is scheduled to be replaced in the next few years. Repairs were also made to adjacent escalators X04 and X06.

An assessment by Metrorail's Fire Marshall concluded that the damage was contained to Escalator X05 and was likely caused by mechanical failure that resulted from excessive heat and smoke conditions.

Probable Cause:



The probable cause of this event was deficient hazard identification and mitigation practices to prevent and identify dirt and grease accumulation, particularly as the escalator approaches the end of its useful life.

Corrective Actions:

The escalator was removed from service, repaired and returned to service on March 20, 2023.

WMATA issued a reminder to ELES mechanics to perform quality Preventive Maintenance Instruction (PMI) and check all components during inspections.

Personnel responsible for maintenance on the unit were counseled on performing maintenance that meets or exceeds original equipment manufacturer specifications.

Since the time of this event, Metrorail has progressed implementation of several corrective action plans to address findings from the WMSC's Audit of Station Maintenance, Elevators and Escalators issued in May 2022.

WMSC staff observations:

On March 17, 2023, the day following the event, an ELES Superintendent conducted a follow-up investigation and did not identify any failed components. However, an analysis conducted by the WMATA Fire Marshal that same day identified the probable ignition source to be friction heating as a result of mechanical failure. Properly identifying, tracking and mitigating hazards is essential to the safety of the Metrorail system.

Metrorail has ongoing, funded long-term plans for escalator rehabilitation and replacement that are carried out across the system. Metrorail should ensure these replacements prioritize those units that are at or beyond their useful life.



Washington Metropolitan Area Transit Authority
Department of Safety (SAFE)
Office of Safety Investigations (OSI)

FINAL REPORT OF INVESTIGATION A&I E23179

Date of Event:	03/16/2023
Type of Event:	Evacuation for Life Safety Reasons
Incident Time:	20:49 hours
Location:	Crystal City Station, Escalator X05
Time and How received by SAFE:	20:59 hours via MAC
WMSC Notification Time:	22:35 hours
Responding Safety Officers:	N/A
Rail Vehicle:	N/A
Injuries:	N/A
Damage:	Stub shaft bearing grease line, main drive chain, numerous steps and axle rollers.
Emergency Responders:	ACFD, ELES, RTRA, and MTPD
SMS I/A Incident Number:	20230317#106965MX

Crystal City Station – Evacuation for Life Safety Reasons

March 16, 2023

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Abbreviations and Acronyms

AFCD	Arlington County Fire Department
ARS	Audio Recording System
CAP	Corrective Action Plan
CCTV	Closed-Circuit Television
ELES	Office of Elevators and Escalator Services
I/A	Incidents/Accidents
ICP	Incident Command Post
MAC	Mission Assurance Coordinator
MSRPH	Metrorail Safety Rules and Procedures Handbook
MTPD	Metro Transit Police Department
NOAA	National Oceanic and Atmospheric Administration
OEP	Office of Emergency Preparedness
OSC	On-Scene Commander
OOS	Out of Service
RTRA	Office of Rail Transportation
ROCC	Rail Operations Control Center
ROCS	Rail Operations Control System
SAFE	Department of Safety
SMS	Safety Measurement System
SRC	Safety Risk Coordinator
WMATA	Washington Metropolitan Area Transit Authority
WMSC	Washington Metrorail Safety Commission

**Washington Metropolitan Area Transit Authority
Department of Safety – Office of Safety Investigations**

Executive Summary

**Note that all times listed are approximate and may contain minor variations due to differences between systems of record. **

On Thursday, March 16, 2023, at 20:49 hours, smoke began emitting from Escalator X05 at Crystal City Station. The Station Manager confirmed the smoke and reported the incident to the Rail Operations Control Center (ROCC). At 20:59 hours, the Mission Assurance Coordinator (MAC) was notified by the Rail Operations Information Center (ROIC) of a fire alarm at Crystal City Station. The ROCC notified the Arlington County Fire Department (ACFD), the Metro Transit Police Department (MTPD), and dispatched an Office of Rail Transportation (RTRA) Supervisor to assist with the scene. ROCC also requested that personnel from the Office of Elevators and Escalator Services (ELES) respond.

Unified Command was established with ACFD and MTPD, with the Incident Command Post (ICP) established on the street level near the station entrance at South Bell Street. ROCC instructed trains to bypass the station, requested a bus bridge, and implemented SOP 1A as mitigation efforts continued. ACFD determined the incident to be a maintenance issue and turned the scene over to MTPD. MTPD transferred the scene to RTRA while ELES personnel continued troubleshooting. The deluge system activated as designed and extinguished the heat source, which also resulted in flooding of the pit.

A post-incident inspection by ELES was unable to determine the proximate cause of the event. Bearings in the area of the origin were found to be well lubricated, and the main drive sprocket was found with some wear damage; however, it could not be confirmed as the source of heat that produced the event. Further discussion and review of the WMATA Fire Marshal's Investigation report resulted in agreement that the likely cause of the fire event was a mechanical failure that resulted in excessive heat and smoke conditions. There were no reported injuries as a result of this incident.

The probable cause of the evacuation for life safety reasons at Crystal City Station on March 16, 2023, was smoke originating from Escalator X05, which resulted from a mechanical failure. This failure led to friction heating within the escalator shaft, causing the internal parts to overheat and combustible materials within the escalator to ignite. As a precaution, the station was closed, and the smoke was effectively dispersed using fire department ventilation fans. The escalator's deluge system extinguished the fire. The incident did not persist after activation of the deluge system.

Incident Site

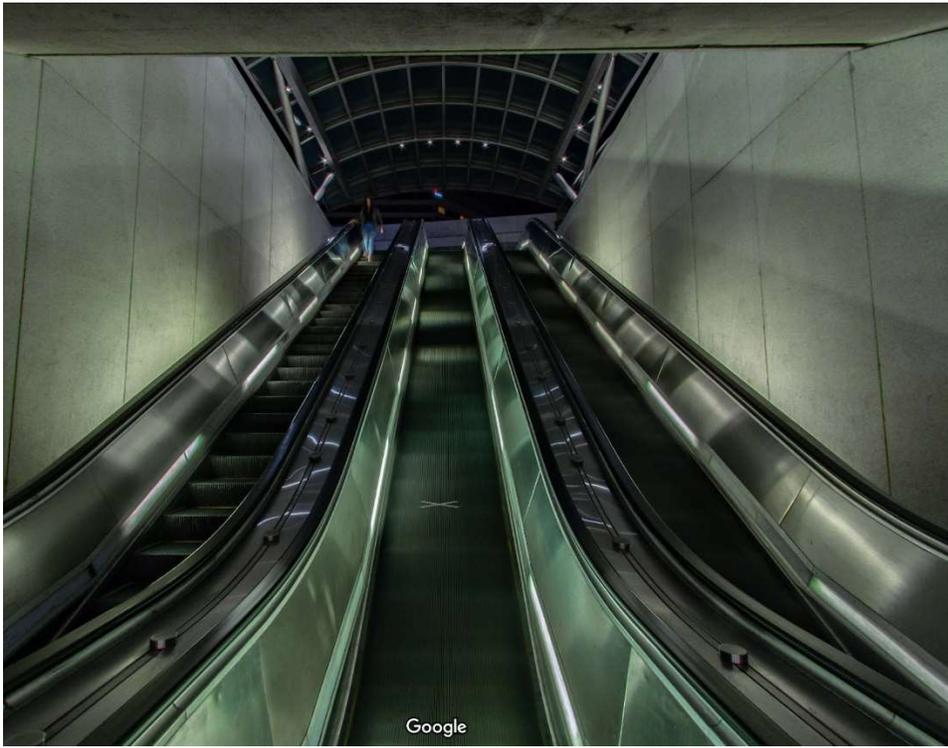
Crystal City Station, Escalator X05

Field Sketch/Schematics

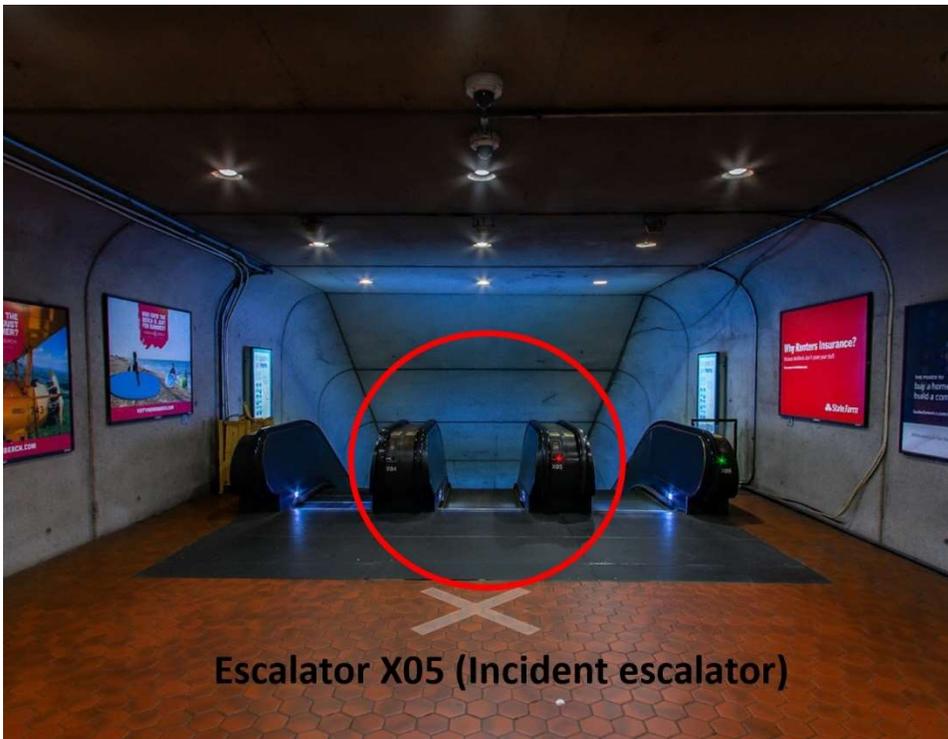


The above depiction is not to scale.

The entrance to Crystal City Station is located at the intersection of 18th Street S and South Bell Street. Escalators X01, X02 and X03 descend from the street level to the Crystal City Shops Level. Escalators X04, X05 and X06 descend from the Crystal City Shops Level to the Mezzanine Level.



Escalators X01, X02 and X03 view from shops level ascending to the street level.



Escalator X05 (Incident escalator)

Escalators X04, X05 and X06 view from the Crystal City Shops Level descending to the Mezzanine Level.

Purpose and Scope

The purpose of this accident investigation and candid self-evaluation is to collect and analyze available facts, determine the probable cause(s) of the incident, identify contributing factors, and make recommendations to prevent a recurrence.

Investigative Methods

The investigative methodologies included the following:

- Site Assessment through documentation review

- 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)
 - Metro Transit Police Department (MTPD) Event Report
 - Rail Operations Control Center (ROCC) Incident Report
 - Rail Operations Control System (ROCS) SPOTS Report
 - Office of Elevators and Escalators Services (ELES) Work Order

- 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]
 - CCTV (Closed-Circuit Television)

Investigation

On Thursday, March 16, 2023, at 20:49 hours, smoke began emitting from Escalator X05 at the Crystal City Station.

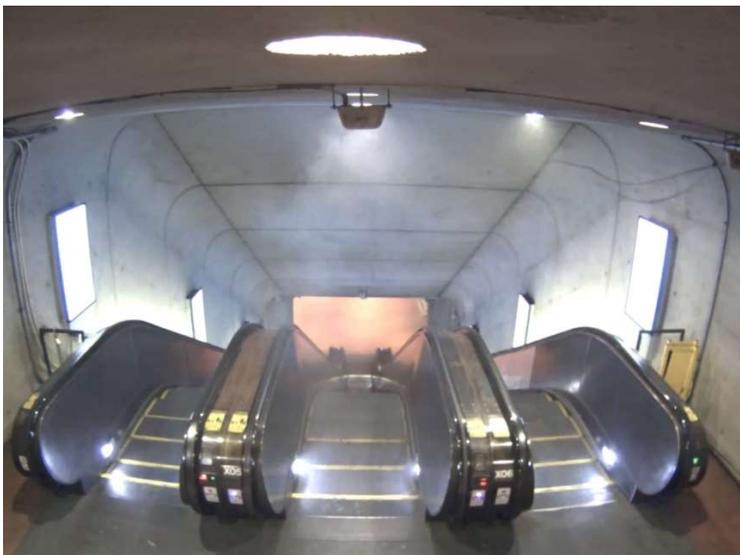


Figure 1 - Smoke emitting from Escalator X05 at 20:49 hours.

The Station Manager confirmed the smoke and reported the incident to the ROCC. Crystal City Station CCTV showed the Station Manager evacuating customers from the station.



Figure 2 - Station Manager instructing customers as they close down all escalators at 20:53 hours.

The ROCC notified ACFD, MTPD, and dispatched an RTRA Supervisor to assist with the scene. ROCC also requested ELES to respond. Crystal City Station CCTV footage determined that ACFD arrived at 21:00 hours.



Figure 3 - ACFD arrived on the scene at 21:00 hours.

Unified command was established with ACFD and MTPD, and they established the ICP on the street level, in front of the escalators near the station entrance at South Bell Street. ACFD set exhaust fans on the mezzanine level to mitigate air quality near the escalators at 21:16 hours.

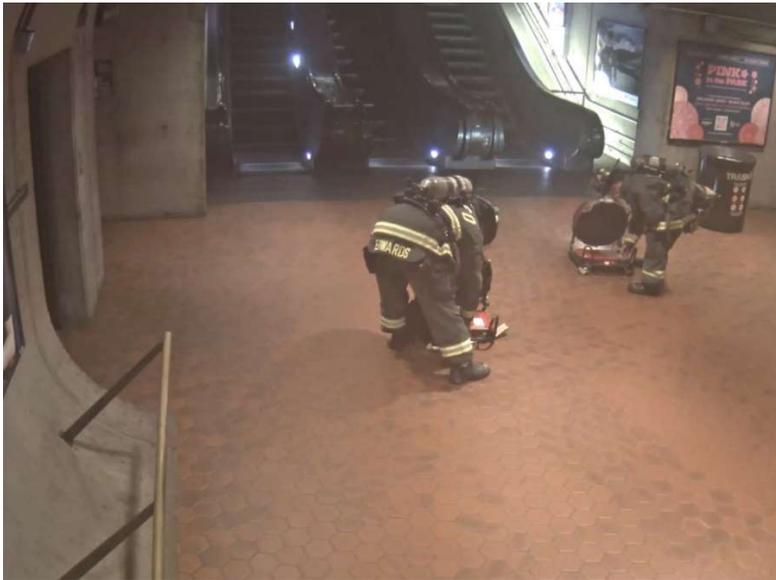


Figure 4 - ACFD setting up ventilation fans at the bottom of the escalators to clear the smoke from the station at 21:16 hours.

ELES Supervisor responded to Crystal City Station in tandem to assess the smoke condition at Crystal City Station.



Figure 5 - ELES Supervisor arrived on the scene at 21:16 hours.

ROCC instructed trains to bypass the station, requested a bus bridge, and implemented SOP 1A as mitigation efforts continued. ACFD determined the incident to be a maintenance issue and turned the scene over to MTPD. MTPD transferred the scene to RTRA while ELES personnel continued troubleshooting. The immediate cause of the smoke was not determined.

The following day Friday, March 17, 2023, ELES personnel conducted a follow-up investigation at Crystal City. The ELES Mechanic reported that they removed five steps of Escalator X05 to gain access to the area where the fire was located. They reported that the initial investigation showed signs that the escalator drive system had shifted to the left side, causing slight contact with the main drive sprocket and step tracks on the right side. They stated there was visible fire damage to the stub shaft bearing grease line, main drive chain, and numerous step and axle rollers the right side. Accumulated dirt and grease were also visible through the escalator but not considered excessive in this instance.

All removed drive components were reportedly visually inspected to determine any cause of the fire. ELES found the bearings were well-greased and showed no signs of wear. The maintenance history was also investigated for Escalator X05, and the components had all been replaced on September 10, 2022, due to wear on the previous parts. Routine maintenance was completed as scheduled on a 45-day cycle. The escalator was last serviced on March 2, 2023. ELES Mechanics stated there is no reported maintenance history on this unit that would have contributed to the cause of the fire. This escalator unit is at the end of its useful life and scheduled for replacement within the next few years.

ELES concluded it is unlikely that the drive sprocket contacting the step track could have created enough heat to cause the combustion of accumulated dirt and grease; however, further discussion and review of the WMATA Fire Marshal's Investigation report resulted in agreement that the likely cause of the fire event was a mechanical failure that resulted in excessive heat and smoke condition. All repairs were completed on March 20, 2023, and the escalator was returned to service. The total parts cost for this incident was \$10,288.57, and labor costs were \$7,273.14.

Chronological Event Timeline

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

Time	Description
20:49:20 hours	Smoke began emitting from the top of ascending Escalator X05 [CCTV]
20:50:20 hours	Descending Escalator X06 stopped running and became stationary [CCTV]
20:52:56 hours	Smoke began emitting from the bottom of ascending Escalator X05 [CCTV]
20:52:58 hours	Ascending Escalator X05 stopped running and became stationary [CCTV]
20:53:00 hours	MTPD received a fire alarm alert from Crystal City Station [MTPD Alert]
20:53:06 hours	Station Manager approached escalators and observed smoke emitting from Escalator X05 [CCTV]
20:53:33 hours	Station Manager arrived at the top of the escalators and began to shut down Escalator X04 [CCTV]
20:54:40 hours	ACFD received a fire alarm call at Crystal City Station. Engine 105 and Truck 105 dispatched [Open MHz]
20:55:44 hours	Station Manager returned to the escalators with a fire extinguisher to assess the scene [CCTV]
20:56:50 hours	ACFD Engine 105 reported on scene and observed smoke coming from the entrance escalators [Open MHz]
20:59:00 hours	The ROIC notified ROCC of smoke emitting from Escalators 4, 5, and 6 at Crystal City Station and requested trains to bypass the station. ROCC instructed trains to bypass Crystal City Station. ROCC notified and dispatched MTPD and ELES personnel [OPS 3]
21:01:00 hours	Shuttle Bus service requested. ROCC instructed Tran ID 459 to stop at Crystal City Station, key down, and allow two customers to board. Train ID 459 compiled and continued on in revenue service. [OPS 3]

Time	Description
21:13:00 hours	RTRA Supervisor arrived on the scene and was appointed as RTRA Forward Liaison [OPS 3]
21:16:43 hours	ACFD placed fans near the bottom of escalators to assist with ventilation [CCTV]
21:16:51 hours	ELES personnel arrived on the scene to assess the escalators [CCTV]
21:40:40 hours	ACFD declared the scene a maintenance issue and departed. MTPD assumed On Scene Commander (OSC) [CCTV]
22:13:00 hours	MTPD transferred OSC to RTRA [OPS 3]
23:09:00 hours	Station reopened, and normal services resumed [OPS 3]

Note: Times above may vary from other systems' timelines based on clock settings.

Office of Elevator of Escalator Maintenance (ELES)

ELES Mechanics assessed the escalators at Crystal City Station. They removed power from the unit to investigate. ELES removed the reducer and components and reinstalled the components on the left side. The escalators were placed out of service (OOS) and barricaded. The bottom pan switches on X04 and X06 were replaced. The steps were cleaned on the adjacent escalators while X05 remained OOS for heavy repair (See Appendix D). This escalator unit is at the end of its useful life and scheduled for replacement within the next few years.

The incident in question involved a fire that originated on Escalator X05 at Crystal City Station. Upon investigation, it was determined that the escalator's drive mechanism had shifted to the right, leading to contact between the drive sprocket and the fixed track. This contact resulted in metal friction between the drive chain and step tracks, generating enough heat to initiate the fire.

The primary cause of the mechanical failure was traced back to loose hardware in the bearing set screws located behind the drive sprocket. It was discovered that the last maintenance conducted on the escalator that would have accessed this component, approximately seven months before the incident, likely failed to ensure the proper tightening of these set screws. Additionally, a misalignment in the reducer stabilizer, a critical component providing redundancy, was identified through photographic evidence from the investigation.

To address the mechanical failure and prevent future incidents, immediate corrective actions were taken. A safety bulletin was issued to all maintenance staff, stressing the importance of proper inspection and tightening of critical components during routine maintenance tasks. Plans were set to replace the escalators, including Escalator X05, as part of the next scheduled replacement contract. The procurement process is underway, and the replacement is expected to be completed within the next 8-12 months.

During the investigation, it was determined that the PMI conducted on Escalator X05 was a monthly inspection, which does not require checks for drive components. The PMI check sheet mandates annual inspections for drive components and adjustments as needed. The most recent monthly inspection performed on the escalator in question was a lower-level inspection and did not include inspection of the drive components. As noted above, the last major inspection was conducted approximately seven months prior to this event.

The investigation revealed that standard procedures for monitoring and inspecting escalators within the WMATA system were generally followed. However, the incident emphasized the critical importance of adhering to the prescribed maintenance schedules and performing thorough PMIs to identify and rectify potential mechanical failures. The age of the escalator was determined not to be a direct factor in the mechanical failure leading to the fire.

Conclusion and Recommendations

In conclusion, the incident at Crystal City Station was attributed to a mechanical failure resulting from loose hardware and misalignment in the escalator's drive system.

Considering the findings, the following recommendations are proposed:

1. Conduct comprehensive training for maintenance staff on proper inspection and tightening procedures for critical components during routine maintenance.
2. Reinforce adherence to prescribed PMI schedules and annual inspections for drive components.
3. Enhance documentation and record-keeping procedures to ensure compliance with maintenance protocols.

These recommendations aim to bolster the safety and reliability of escalators within the WMATA network, ultimately ensuring the well-being of passengers and personnel alike.

Office of Emergency Preparedness (OEP) Fire Marshal

The Fire Marshal performed an analysis of the incident scene and determined the probable ignition source was friction heating as a result of mechanical failure. The Fire Marshal reviewed the scene and conducted discussion with personnel from ELES. The damage was contained to the escalator mechanical area and the sprinkler deluge system was activated to extinguish the fire in the incipient phase (See Appendix E).

Weather

On March 16, 2023, at the time of the incident, NOAA recorded the temperature as 47° F, with no wind, clear, 40% humidity, and visibility of 10 miles. This event occurred at the entrance and within the escalator section of the station. Weather was not a contributing factor in this incident (Weather source: NOAA – Location: Arlington, VA)

Related Rules and Procedures

- SOP #1A – Command, Control and Coordination of Emergencies on the Rail System.

Findings

- The MTPD received a fire alarm for Crystal City Station.
- The ACFD determined Escalator X05 was the source of the smoke.
- ELES conducted a follow-up site investigation on March 17, 2023, to determine the cause of the smoke. No failed components were identified during this inspection; however, further discussion and review of the WMATA Fire Marshal's Investigation report resulted in agreement that the likely cause of the fire event was a mechanical failure that resulted in excessive heat and smoke condition.
- The escalator deluge system functioned as designed and extinguished the fire.

Immediate Mitigation to Prevent Recurrence

- The Station Manager promptly closed the station and initiated the evacuation of customers.

- The ROCC implemented Standard Operating Procedure 1A (SOP 1A), which outlines the command, control, and coordination of emergencies on the rail system.
- The ROCC directed trains to be turned back and established a bus bridge to allow for the bypassing of the affected station.
- Mechanics from ELES assessed the escalator involved in the incident to evaluate its condition and address any necessary repairs.

Probable Cause Statement

The probable cause of the evacuation for life safety reasons at Crystal City Station on March 16, 2023, was smoke originating from Escalator X05, which resulted from a mechanical failure. This failure led to friction heating within the escalator shaft, causing the internal parts to overheat and combustible materials within the escalator to ignite. As a precaution, the station was closed, and the smoke was effectively dispersed using fire department ventilation fans. The escalator’s deluge system extinguished the fire. The incident did not persist after activation of the deluge system.

Recommended Corrective Actions

Corrective Action Code	Description	Responsible Party	Estimated Completion Date
106965MX_SAFECAPS_ELES_001	(RC-1) ELES Management will issue a reminder to all mechanics to perform quality PMI and check all required components during inspections.	ELES SRC	Completed
106965MX_SAFECAPS_ELES_002	(RC-1) Mechanics that performed previous PMI on the unit were counseled on performing maintenance that meets or exceeds OEM specifications.	ELES SRC	Completed
106965MX_SAFECAPS_ELES_003	Escalator to be scheduled for replacement.	ELES SRC	12/31/2024

Appendices

Appendix A – Rail Operations Control System (ROCS) Spots Report

ROCS SPOTS REPORT

based on up-to-the-second operational performance data from the Rail Operations Control System

Current date/time: Mon Mar 20 16:22:40 2023

Select Platform: and/or Select ID: Leave blank to remove criteria
 and/or Select 4-digit car number: Leave blank to remove criteria
 Select Date: Select Times (0-24HRS): From To

ID	Platform	length	dcode	Right door open	Right door close	dwel	Left door open	Left door close	dwel	Head Arrived	Tail cleared	cars	Headway door open to door open
407	C09-1	8	72	20:01:31	20:01:48	17				20:01:04	20:02:12	6083-6082.6010-6011.6064-6065.6179-6178	-
453	C09-1	6	19	20:13:18	20:13:35	17				20:12:47	20:13:57	3005-3004.3240-3241.3208-3209	11:47
408	C09-1	6	72	20:18:16	20:18:39	23				20:17:49	20:19:00	6124-6125.6162-6163.6147-6146	4:58
454	C09-1	8	19	20:28:35	20:28:55	20				20:28:01	20:29:19	unknown	10:19
409	C09-1	6	72	20:34:18	20:34:34	16				20:33:47	20:34:54	3192-3193.3286-3287.3248-3249	5:43
455	C09-1	6	19	20:43:38	20:44:00	22				20:43:12	20:44:19	3273-3272.3259-3258.3111-3110	9:20
410	C09-1	6	72	20:47:12	20:47:35	23				20:46:40	20:47:54	6057-6056.6175-6174.6054-6055	3:34
456	C09-1	0	19							20:59:14	20:59:53	6077-6076.6080-6081.6062-6063.6119-6118	-
411	C09-1	6	72							21:02:58	21:03:33	6089-6088.6132-6133.6145-6144	-
457	C09-1	6	19							21:13:49	21:14:50	6173-6172.6165-6164.6148-6149	-
421	C09-1	6	72							21:20:48	21:21:22	3229-3228.3268-3269.3243-3242	-
458	C09-1	6	19							21:31:04	21:31:34	6058-6059.6066-6067.6091-6090	-
402	C09-1	8	72							21:37:00	21:37:32	7494-7495.7315-7314.7694-7695.7145-7144	-
459	C09-1	6	19							21:44:25	21:44:55	6086-6087.6002-6003.6012-6013	-
405	C09-1	8	72							22:05:28	22:05:55	7640-7641.7681-7680.7496-7497.7669-7668	-
406	C09-1	8	72							22:31:08	22:31:42	6025-6024.6117-6116.6009-6008.6171-6170	-
408	C09-1	6	72	22:56:33	22:56:55	22				22:56:03	22:57:16	6124-6125.6162-6163.6147-6146	129:21

Attachment 1 – ROC SPOTS Report Page 1 of 2

ROCS SPOTS REPORT

based on up-to-the-second operational performance data from the Rail Operations Control System

Current date/time: Mon Mar 20 16:24:13 2023

Select Platform: and/or Select ID: Leave blank to remove criteria
 and/or Select 4-digit car number: Leave blank to remove criteria
 Select Date: Select Times (0-24HRS): From To

Generate Report

ID	Platform	length	dcode	Right door open	Right door close	dwll	Left door open	Left door close	dwll	Head Arrived	Tail cleared	cars	Headway door open to door open
411	C09-2	6	16	20:04:47	20:05:07	20				20:04:18	20:05:30	6144-6145.6133-6132.6088-6089	-
472	C09-2	8	21	20:08:45	20:09:01	16				20:08:16	20:09:24	7740-7741.7535-7534.7570-7571.7731-7730	3:58
456	C09-2	8	21	20:22:38	20:23:08	30				20:22:08	20:23:32	6118-6119.6063-6062.6081-6080.6076-6077	13:53
421	C09-2	6	16	20:24:38	20:25:05	27				20:24:11	20:25:27	3242-3243.3269-3268.3228-3229	2:00
457	C09-2	6	21	20:31:35	20:31:58	23				20:31:08	20:32:22	6149-6148.6164-6165.6172-6173	6:57
402	C09-2	8	16	20:37:04	20:37:21	17				20:36:28	20:37:44	7144-7145.7695-7694.7314-7315.7495-7494	5:29
458	C09-2	6	21	20:44:13	20:44:30	17				20:43:43	20:44:53	6090-6091.6067-6066.6059-6058	7:09
403	C09-2	8	16	20:52:20	20:52:37	17				20:51:44	20:53:01	7008-7009.7645-7644.7266-7267.7523-7522	8:07
459	C09-2	6	21							21:04:45	21:05:56	6013-6012.6003-6002.6087-6086	-
405	C09-2	8	16							21:09:33	21:10:07	7668-7669.7497-7496.7680-7681.7641-7640	-
471	C09-2	6	21							21:16:12	21:16:41	unknown	-
404	C09-2	8	16							21:25:15	21:25:43	7516-7517.7421-7420.7044-7045.7107-7106	-
451	C09-2	4	21							21:27:41	21:28:09	7010-7011.7155-7154.7072-7073.7297-7296	-
406	C09-2	8	16							21:42:42	21:43:14	6170-6171.6008-6009.6116-6117.6024-6025	-
452	C09-2	6	21							21:46:08	21:46:33	3262-3263.3187-3186.3276-3277	-
453	C09-2	6	21							21:57:03	21:57:31	3209-3208.3241-3240.3004-3005	-
408	C09-2	6	16							22:06:39	22:07:13	6146-6147.6163-6162.6125-6124	-
454	C09-2	8	21							22:09:21	22:10:09	unknown	-
409	C09-2	6	16							22:44:54	22:45:19	3249-3248.3287-3286.3193-3192	-
411	C09-2	6	16	23:09:27	23:09:48	21				23:09:02	23:10:13	6144-6145.6133-6132.6088-6089	137:07
402	C09-2	8	16	23:35:20	23:35:32	12				23:34:49	23:35:54	unknown	25:53

Attachment 2 – ROC SPOTS Report Page 2 of 2

Appendix B – Rail Operations Control Center Incident Report (Abridged)

View Approved Incident Report

INCIDENT ID: 2023075BLUE10					
DATE 2023-03-16	TIME 2059	LINE Blue	ITEM 10		
LOCATION (STATION/YARD) Pentagon City (C08)	LOCATION/CHAIN MARKER (If Applicable)		REPORTED BY ROIC		
TRAIN ID 456	DIRECTION I/B	TRACK NUMBER 1	DEPTS NOTIFIED Everbridge Alert/Messaging		
CAR NUMBERS (XXXX-XXXX) Lead Car					
-	-	-	-		
Caused Issue <input type="checkbox"/>	Caused Issue <input type="checkbox"/>	Caused Issue <input type="checkbox"/>	Caused Issue <input type="checkbox"/>		
TRBL CODE SMKS-SMOKE IN STATION	RESP CODE ELE				
TYPE INCIDENT Smoke in the station					
ACTION PLAN Trains By-pass the Station, Implement Shuttle Bus Service					
DELAYS IN MINUTES					
LINE	INCIDENT	TRAIN	TOTAL DURATION		
0	15	0	0		
TRIPS MODIFIED					
PARTIAL	GAP TRAIN	LATE DISPATCHES	REROUTED	NOT DISPATCHED	OFFLOADS
0	0	0	0	0	0
FIVE PRIMARY CONSOLE INDICATIONS					
BCP	BRAKES ON ILLUMINATED	ALL DOORS CLOSED ILLUMINATED	AUTO\MANUAL ILLUMINATED	BPP	
Yes	Yes	Yes	MANUAL	Yes	
INCIDENT CHRONOLOGY					
TIME	DESCRIPTION				
2059	ROIC notified OPS 3 and stated that smoke was emitting from escalators 4,5, and 6 at Crystal City Station and requested trains to bypass the station . The AOM, MTPD, MOC, and all concerned personnel were notified.				

Attachment 3 – ROCC Incident Report page 1 of 2

View Approved Incident Report

2101	Shuttle Bus service was requested, and Local bus service being utilized. Train #459 track was instructed to stop at Crystal City on track two and key customers aboard the train and continued in revenue service to Huntington Station. Train #411 was instructed to stop at Crystal City track one. Arlington Fire Department arrived on the scene.
2105	Station Supervisor [REDACTED] arrived on the scene to assist.
2113	Unit #58 RTRA Supervisor [REDACTED] arrived on the scene and was appointed as the RTRA Forward Liaison.
2129	ELES arrived on the scene and began to assist.
2143	Shuttle bus service was established from Crystal City to Pentagon City.
2148	Fire department departed and returned the scene to MTPD.
1013	MTPD turned the scene over to RTRA.
2255	Train #408 was the first train to service Crystal City track one.
2309	Train #411 was the first train to service Crystal City track two. Normal service resumed.

MAXIMO TICKET#
8659038

REPORT PREPARED BY	NAME	CLICK TO SIGN
RADIO CONTROLLER 1	[REDACTED]	✓
BUTTON CONTROLLER 1	[REDACTED]	✓
RADIO CONTROLLER 2	[REDACTED]	✓
BUTTON CONTROLLER 2	[REDACTED]	✓

SUPERINTENDENTS OR ASSISTANTS SECTION

ADDITIONAL FOLLOW-UP CORRECTIVE ACTIONS OR REMARKS RTC's [REDACTED] and [REDACTED] were the primary RTC's for this incident.

FOLLOW-UP INFORMATION OBTAINED FROM SUPPORT DEPARTMENTS

NOTIFICATIONS/PAGE GROUPS #1/CEO #2/DGM & BELOW

ADDITIONAL NOTIFICATIONS MADE BY PHONE

APPROVED BY	NAME	CLICK TO SIGN
REPORT APPROVED BY SUPT. OR ASST SUPT.	[REDACTED]	✓

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Attachment 4 – ROCC Incident Report page 2 of 2

Appendix C – Office of Elevators and Escalators Services (ELES) Superintendent Memo (Redacted)

M E M O R A N D U M



SUBJECT: C09X05 ESCALATOR FIRE

DATE: March 21, 2023

FROM: [REDACTED]

TO: [REDACTED]

On Friday March 17th I responded to Crystal City station to investigate a fire on escalator X05 that had happened the night before. Once there I spoke with the ELES Supervisor [REDACTED] and the crews who had been there looking into the issues with the escalators. The mechanics had removed 5 steps of escalator X05 to gain access to the area where the fire was located. The initial investigation showed signs that the escalator drive system had shifted to the left-hand side causing slight contact with the drive sprocket and step tracks on the right-hand side. There was also visible fire damage to the stub shaft bearing grease line, main drive chain, as well as numerous step and axle rollers all on the right side. Accumulated dirt and grease were also visible through the escalator but not excessive in this instance.

Work was paused until Safety and the Fire Marshal came to the scene and investigated the incident. Once their preliminary investigation was completed the repair crews started to disassemble the escalator further. All drive components that were removed were visually inspected to determine any role in the fire. We found the bearings were well greased and showed no signs of wear. The main drive sprocket on right-hand side did have wear damage from contacting the step track. No further signs of damage were observed. The maintenance history was also investigated into this escalator. The above-mentioned components had all been replaced on 09/10/2022 due to wear on the previous parts. Schedule maintenance was completed regularly as schedule on a 45-day cycle with the last having been done on 03/02/2023. There is no history on this unit that would have shown to contribute to the fire. From these finding it is my opinion that it is unlikely that the drive sprocket contacting the step track could have created enough heat to cause combustion of accumulated dirt and grease. What is more likely is an outside source like a discarded cigarette or match was the cause of the fire in the escalator.

Repair work was completed on 03/20/2023 and the escalator was returned to service.

[REDACTED]
Assistant Superintendent of
Elevator and Escalator Maintenance

Washington
Metropolitan Area
Transit Authority

Attachment 5 – ELES Memorandum page 1 of 1.

Appendix D – Office of Elevators and Escalators Services (ELES) Work Order



Washington Metropolitan Area Transit Authority Maintenance and Material Management System Work Order Details

Page 1 of 6
MX76PROD

Work Order #: 17742354
Type: CM



Status: COMP
03/20/2023 13:01

Work Description: INVESTIGATE THERMAL EVENT AT RIGHT SIDE OF DRIVE 1 ***material ordered
Job Plan Description:

Work Information			
Asset: 6269	ESCALATOR, C09X05, WESTINGHOUSE, WE100, ENTRANCE, INTERIOR, MEZZ 045, 2-DRIVE	Owning Office: ELES-OPER	Parent:
Asset Tag: C09X05 ESC		Maintenance Office: ELES-ESCA-Y1R4	Create Date: 03/17/2023 01:12
Asset S/N: C09X05		Labor Group:	Actual Start: 03/16/2023 21:15
Location: 9201	C09, CRYSTAL CITY, 045, C09XCE2, ESCALATOR BANK #2 ENTRANCE (SOUTH)	Crew:	Actual Comp: 03/20/2023 13:01
Work Location:		Lead:	Item: ESCA02
Failure Class: ELES1002 ESCALATOR		GL Account: WMATA-33-31822-50499160-042-CIP0132*****-CAP**.....-2019****-.....-EQUIP_MATL*****	
Problem Code: 0005 MAJOR REPAIR		Supervisor:	Target Start: 03/17/2023 01:13
Requested By: SUMMERS		Requestor Phone: [REDACTED]	Target Comp: 03/23/2023 01:12
Chain Mark Start:		Chain Mark End:	Scheduled Start:
Create-Mileage: 0.0		Complete-Mileage: 0.0	

Task IDs

Task ID	Description	Component	Work Accomp	Reason	Status	Position	Warranty?:
10	Under investigation						
20	Assisted supervisor in removing power from unit and investigating thermal event. <small>Found issue appears to have started at or below the pan at drive 1 on the right side. The lower poly's, nylon guide of the broken chain switch, several axle rollers and horizontal guide rollers, and grease lines are all melted. The reducer has shifted to the left, came out of the stabilizer plate, and rubbing the lower right horizontal guide track. Unable to determine if this happens as a result of the polys on the chain melting or not. Unit is mainlined but power department restored all power to units. Also the deluge went off flooding the pit. The mechanics on site will continue pumping the pit.</small>	100-102-014 ESCALATOR MISC EQUIPMENT	UPDATED	INCIDENT//ACCIDENT	COMP		N
30	ordered par switches jim	100-102-013-100-048 POWER SUPPLY	TROUBLE SHOT	BURNT	COMP		N
40	Removed reducer and components. Reinstalled components on left side. Waiting on right side bearing and stubshaft. Mainlined, barricaded, OOS.	100-102-005-100 ESCALATOR PIT PARTS	UPDATED	INCIDENT//ACCIDENT	COMP		N
		100-102-006-009 REDUCER	UPDATED	OVERHEATED	COMP		N

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03/21/2023 07:16

Attachment 6 – ELES repair work orders page 1 of 6

Incident Date: 03/16/2023 Time: 20:49 hours
Final Report – Evacuation for Life Safety Reasons
E23179

Drafted By: SAFE 702 – 04/26/2023
Reviewed By: SAFE 704 – 05/31/2023
Approved By: SAFE 71 – 06/05/2023

Page 19



Washington Metropolitan Area Transit Authority
Maintenance and Material Management System
Work Order Details

Work Order #: 17742354
 Type: CM



Status: COMP
 03/20/2023 13:01

Work Description: INVESTIGATE THERMAL EVENT AT RIGHT SIDE OF DRIVE 1 ***material ordered
 Job Plan Description:

Task IDs						
Task ID						
50	Replaced bottom pan switches on X04 and X06. Cleaned steps on both units. X04 and X06 are in service. C09x05 remains OOS for DU1 drive repairs. Heavy Repair is on site addressing this unit.					
Component:	100-102 ESCALATOR	Work Accomp:	REPLACED NEW	Reason:	WORN	Status: COMP Position: Warranty?: N
60	changed bottom pan switches pumped pit					
Component:		Work Accomp:	TROUBLE SHOT	Reason:	LEAKING WATER	Status: COMP Position: Warranty?: N
70	SEE LONG DESCRIPTION Fire @ DU1 Drive component replacement At DU1, Completed installation of chains, sprockets, reducer, brake, skirts, brushes, and panels. Greased stubshaft and idler bearings. Installed all panels in unit. Cannot run unit until pan switches are replaced in top pit. Needs one section of rack installed and burnt step and rack rollers replaced. DU1 WILL NEED FINAL ADJUSTMENTS AFTER RACK SECTION IS INSTALLED. Unit OOS. Barricaded, mainlined, LOTO.					
Component:	100-102-009 ESCALATOR PANEL SYSTEM	Work Accomp:	UPDATED	Reason:		Status: COMP Position: Warranty?: N
80	Parts for Perry					
Component:		Work Accomp:		Reason:		Status: COMP Position: Warranty?: N
90	found pan switches but got called off to go to c03 no service will come back an install sw					
Component:		Work Accomp:		Reason:		Status: COMP Position: Warranty?: N
100	LONG DESCRIPTION Installed and married rack, adjusted top and bottom turnarounds, replaced broken hardware on bottom turnaround. Hardware in bottom turn around is loose. Adjusted DU1 but needs further adjustments. Replaced 3 steps, 4 burnt guide rollers and 3 axle rollers. Unit has a safety string fault which will need to be investigated. Unit also needs load share. Both left and right handrails are not turning, that will also need to be investigated further. Unit is barricaded, mainlined, LOTO and out of service.					
Component:		Work Accomp:	UPDATED	Reason:		Status: COMP Position: Warranty?: N
110	SEE LONG DESCRIPTION Performed load share adjustments. Installed all but 4 steps. Tightened HR pressure rollers to ensure both handrails turn. All mechanical work is complete. Needs master tech to diagnose unknown safety string fault. Unit is ready for master tech. Mainlined, barricaded, LOTO.					
Component:		Work Accomp:	UPDATED	Reason:		Status: COMP Position: Warranty?: N
120	TROUBLESHOT UNIT. FOUND TOP PAN SWITCHES BAD, REPLACED WITH NEW. ADJUSTED SPEEDSENSOR AT DU1. CLEANED STEPS AS NEEDED. CHECK OPS UNIT RETURNED TO SERVICE.					
Component:	100-102-008-003 Broken Step Switch	Work Accomp:	REPLACED NEW	Reason:	DAMAGED	Status: COMP Position: 1011 Warranty?: N
WT_plust_woprint.rptdesign						03/21/2023 07:16

Attachment 7 – ELES repair work order page 2 of 6



Washington Metropolitan Area Transit Authority
Maintenance and Material Management System
Work Order Details

Work Order #: 17742354
Type: CM



Status: COMP
03/20/2023 13:01

Work Description: INVESTIGATE THERMAL EVENT AT RIGHT SIDE OF DRIVE 1 ***material ordered
Job Plan Description:

Planned Materials									
Task ID	Item	Description	Storeroom	Issue Unit	Quantity	Unit Cost	Line Cost		
30	R38301614	SWITCH, LIMIT: ACTION: 1/2 IN NPT, ACTUATOR: R38301617 - SPRING, BODY: 3SE03-SB, CONTACT ARRANGEMENT: 2NO-2NC, ENCLOSURE: IP67, FITS: WESTINGHOUSE ESCALATORS, HEAD: 3SE03-DM1, MOUNTING: SCREW, USED ON: WOBBLE HEAD, VOLTAGE: 120VAC	320	EA	6	\$212.75	\$1,276.50		
40	R38305237	ASSEMBLY, RACK/AXLE: RACK & AXLE, 6 AXLE ASSEMBLY, FITS: 6 STEP ASSEMBLY, INCLUDES: BLUE FAIGLE ROLLERS, LENGTH: 8 FT, USED ON: WESTINGHOUSE MOD 100 & 250, WIDTH: 45 IN	320	EA	1	\$870.00	\$870.00		
40	R38300008	SPROCKET, IDLER, NOTE: USE E38300921 TILL DEPLETED	320	EA	1	\$845.00	\$845.00		
40	R38300091	CHAIN, DRIVE: POLY, NOTE: USE E38300701 TILL DEPLETED	320	PR	1	\$774.85	\$774.85		
40	R38300202	BRAKE, ELECTRIC GLIDE STOP: BORE: 1-3/8IN, DUTY: NORMAL, MOUNT: INSIDE, USED ON: WESTINGHOUSE MOD 100 & 250, VOLTAGE: 90VDC	320	EA	1	\$1,350.00	\$1,350.00		
40	V38300286	STEP, ESCALATOR: COLOR: BLACK WITH YELLOW DEMARCATIONS, TYPE: FULL ASSEMBLY, WITH: 48 IN	320	EA	4	\$0.00	\$0.00		
40	R38302097	SOLVENT, HEAVYDUTYDEGREASER: KUSTOM 221, ISSUE UNIT: 1 BOTTLE= 2.5 GALLONS, NOTES: KUSTOM 221 REPLACES ELECTRA 221, TYPE: HEAVY DUTY DEGREASER, USED FOR: CLEANING ESCALATOR	320	GL	5	\$30.88	\$154.38		
40	R99990180	ABSORBENT: FORM: SHEET, TYPE: OIL, COMMONNAME: Oil Absorbent sheet	320	RL	1	\$75.20	\$75.20		
40	R38305238	KIT, RACK & AXLE: FITS: 48 IN UNITS, INCLUDES: ROLLERS, 2 RACK SECTIONS, SHAFT, SPACERS, CAPS & HARDWARE, ROLLER: BLUE FAIGLE ROLLERS, USED ON: WESTINGHOUSE MOD 100 & 250, WORKS WITH: R38305237 - RACK	320	EA	1	\$135.77	\$135.77		
40	R38300008	SPROCKET, IDLER, NOTE: USE E38300921 TILL DEPLETED	320	EA	1	\$845.00	\$845.00		
40	R38300189	ASSEMBLY, BROKEN CHAIN SWITCH, NOTE: USE E38300946 TILL DEPLETED	320	EA	1	\$175.00	\$175.00		
40	R38300029	SHAFT, STUB, NOTE: USE E38300724 TILL DEPLETED	320	EA	1	\$361.11	\$361.11		
40	R38300029	SHAFT, STUB, NOTE: USE E38300724 TILL DEPLETED	320	EA	1	\$361.11	\$361.11		
40	R38300114	SPROCKET, DRIVE, NOTE: USE E38300702 TILL DEPLETED	320	EA	1	\$832.44	\$832.44		
40	R38300114	SPROCKET, DRIVE, NOTE: USE E38300702 TILL DEPLETED	320	EA	1	\$832.44	\$832.44		
40	R38300193	BEARING FLANGE, SPHERICAL ROLLER, NOTE: USE E38300843 TILL DEPLETED	320	EA	1	\$327.75	\$327.75		
40	R38300193	BEARING FLANGE, SPHERICAL ROLLER, NOTE: USE E38300843 TILL DEPLETED	320	EA	1	\$327.75	\$327.75		
80	R38301614	SWITCH, LIMIT: ACTION: 1/2 IN NPT, ACTUATOR: R38301617 - SPRING, BODY: 3SE03-SB, CONTACT ARRANGEMENT: 2NO-2NC, ENCLOSURE: IP67, FITS: WESTINGHOUSE ESCALATORS, HEAD: 3SE03-DM1, MOUNTING: SCREW, USED ON: WOBBLE HEAD, VOLTAGE: 120VAC	320	EA	3	\$212.75	\$638.25		
80	R38301617	SPRING, SWITCH: WOBBLE HEAD, SWITCH WAND, FITS: LIMIT SWITCH, LENGTH: 4-1/8 IN, MATERIAL: STEEL, USED ON: WESTINGHOUSE UNITS	320	EA	3	\$35.34	\$106.02		
Total Planned Materials:							\$10,288.57		

Actual Labor									
Task ID	Labor	Start Date	End Date	Start Time	End Time	Approved?	Regular Hours	Premium Hours	Line Cost
10		03/16/2023	03/17/2023	22:00	06:00	Y	08:00	00:00	\$437.72

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03/21/2023 07:16

Attachment 8 – ELES repair work order page 3 of 6

Incident Date: 03/16/2023 Time: 20:49 hours
Final Report – Evacuation for Life Safety Reasons
E23179

Drafted By: SAFE 702 – 04/26/2023
Reviewed By: SAFE 704 – 05/31/2023
Approved By: SAFE 71 – 06/05/2023

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Washington Metropolitan Area Transit Authority
Maintenance and Material Management System
Work Order Details

Work Order #: 17742354
 Type: CM



Status: COMP
 03/20/2023 13:01

Work Description: INVESTIGATE THERMAL EVENT AT RIGHT SIDE OF DRIVE 1 ***material ordered

Job Plan Description:

Actual Labor										
Task ID	Labor	Start Date	End Date	Start Time	End Time	Approved?	Regular Hours	Premium Hours	Line Cost	
10		03/16/2023	03/17/2023	22:00	08:30	Y	10:30	00:00	\$574.51	
10		03/16/2023	03/17/2023	22:00	06:00	Y	08:00	00:00	\$445.72	
20		03/16/2023	03/17/2023	21:00	01:30	Y	04:30	00:00	\$250.72	
40		03/17/2023	03/17/2023	04:30	13:30	Y	09:00	00:00	\$380.72	
40		03/17/2023	03/17/2023	04:30	13:30	Y	09:00	00:00	\$492.44	
40		03/17/2023	03/17/2023	04:30	13:30	Y	09:00	00:00	\$492.44	
40		03/17/2023	03/17/2023	04:30	13:30	Y	09:00	00:00	\$492.44	
50		03/17/2023	03/17/2023	06:50	09:30	Y	02:40	00:00	\$145.91	
50		03/17/2023	03/17/2023	06:50	09:30	Y	02:40	00:00	\$148.57	
60		03/17/2023	03/18/2023	22:00	05:15	Y	07:15	00:00	\$277.38	
60		03/17/2023	03/18/2023	22:00	05:15	Y	07:15	00:00	\$403.94	
70		03/18/2023	03/18/2023	02:15	11:45	Y	09:30	00:00	\$519.80	
70		03/18/2023	03/18/2023	02:15	11:45	Y	09:30	00:00	\$519.80	
90		03/18/2023	03/19/2023	22:30	02:45	Y	04:15	00:00	\$236.79	
100		03/19/2023	03/19/2023	04:45	11:20	Y	06:35	00:00	\$324.19	
100		03/19/2023	03/19/2023	04:45	11:20	Y	06:35	00:00	\$360.21	
110		03/20/2023	03/20/2023	02:00	05:10	Y	03:10	00:00	\$173.27	
110		03/20/2023	03/20/2023	02:00	05:10	Y	03:10	00:00	\$173.27	
120		03/20/2023	03/20/2023	08:30	12:20	Y	03:50	00:00	\$209.74	
120		03/20/2023	03/20/2023	08:30	12:20	Y	03:50	00:00	\$213.58	
Total Actual Hour/Labor:							137:15	00:00	\$7,273.14	

Actual Materials										
Task ID	Item	Assetnum	Description	Storeroom	Trans Date	Issue Unit	Quantity	Unit Cost	Line Cost	
30	R38301614		SWITCH, LIMIT, ACTION: 1/2 IN NPT, ACTUATOR: R38301617 - SPRING, BODY: 3SE03-SB, CONTACT ARRANGEMENT: 2NO-2NC, ENCLOSURE: IP67, FITS: WESTINGHOUSE ESCALATORS, HEAD: 3SE03-DM1, MOUNTING: SCREW, USED ON: WOBBLER HEAD, VOLTAGE: 120VAC	320	03/17/2023	EA	6	\$212.75	\$1,276.50	
40	R38300114		SPROCKET, DRIVE, NOTE: USE E38300702 TILL DEPLETED	320	03/17/2023	EA	1	\$832.44	\$832.44	
40	R38302097		SOLVENT, HEAVY DUTY DEGREASER: KUSTOM 221, ISSUE UNIT: 1 BOTTLE= 2.5 GALLONS, NOTES: KUSTOM 221 REPLACES ELECTRA 221, TYPE: HEAVY DUTY DEGREASER, USED FOR: CLEANING ESCALATOR	320	03/17/2023	GL	5	\$30.88	\$154.38	

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03/21/2023 07:16

Attachment 9 – ELES repair work order page 4 of 6

Incident Date: 03/16/2023 Time: 20:49 hours
 Final Report – Evacuation for Life Safety Reasons
 E23179

Drafted By: SAFE 702 – 04/26/2023
 Reviewed By: SAFE 704 – 05/31/2023
 Approved By: SAFE 71 – 06/05/2023



**Washington Metropolitan Area Transit Authority
Maintenance and Material Management System
Work Order Details**

Work Order #: 17742354
Type: CM



Status: COMP
03/20/2023 13:01

Work Description: INVESTIGATE THERMAL EVENT AT RIGHT SIDE OF DRIVE 1 ***material ordered

Job Plan Description:

Actual Materials									
Task ID	Item	Assetnum	Description	Storeroom	Trans Date	Issue Unit	Quantity	Unit Cost	Line Cost
40	R38300189		ASSEMBLY, BROKEN CHAIN SWITCH. NOTE: USE E38300946 TILL DEPLETED	320	03/17/2023	EA	1	\$175.00	\$175.00
40	R38300029		SHAFT, STUB. NOTE: USE E38300724 TILL DEPLETED	320	03/17/2023	EA	1	\$361.11	\$361.11
40	R38300193		BEARING FLANGE, SPHERICAL ROLLER. NOTE: USE E38300843 TILL DEPLETED	320	03/17/2023	EA	1	\$327.75	\$327.75
40	R38300008		SPROCKET, IDLER. NOTE: USE E38300921 TILL DEPLETED	320	03/17/2023	EA	1	\$845.00	\$845.00
40	R38300202		BRAKE, ELECTRIC GLIDE STOP; BORE: 1-3/8IN, DUTY: NORMAL, MOUNT: INSIDE, USED ON: WESTINGHOUSE MOD 100 & 250, VOLTAGE: 90VDC	320	03/17/2023	EA	1	\$1,350.00	\$1,350.00
40	R38300114		SPROCKET, DRIVE. NOTE: USE E38300702 TILL DEPLETED	320	03/17/2023	EA	1	\$832.44	\$832.44
40	R38305238		KIT, RACK & AXLE; FITS: 48 IN UNITS, INCLUDES: ROLLERS, 2 RACK SECTIONS, SHAFT, SPACERS, CAPS & HARDWARE, ROLLER: BLUE FAIGLE ROLLERS, USED ON: WESTINGHOUSE MOD 100 & 250, WORKS WITH: R38305237 - RACK	320	03/17/2023	EA	1	\$135.77	\$135.77
40	R38300193		BEARING FLANGE, SPHERICAL ROLLER. NOTE: USE E38300843 TILL DEPLETED	320	03/17/2023	EA	1	\$327.75	\$327.75
40	R38300029		SHAFT, STUB. NOTE: USE E38300724 TILL DEPLETED	320	03/17/2023	EA	1	\$361.11	\$361.11
40	R38300008		SPROCKET, IDLER. NOTE: USE E38300921 TILL DEPLETED	320	03/17/2023	EA	1	\$845.00	\$845.00
40	R38305237		ASSEMBLY, RACK/AXLE; RACK & AXLE, 6 AXLE ASSEMBLY, FITS: 6 STEP ASSEMBLY, INCLUDES: BLUE FAIGLE ROLLERS, LENGTH: 8 FT, USED ON: WESTINGHOUSE MOD 100 & 250, WIDTH: 45 IN	320	03/17/2023	EA	1	\$870.00	\$870.00
40	R38300091		CHAIN, DRIVE; POLY. NOTE: USE E38300701 TILL DEPLETED	320	03/17/2023	PR	1	\$774.85	\$774.85
40	V38300286		STEP ESCALATOR; COLOR: BLACK WITH YELLOW DEMARICATIONS, TYPE: FULL ASSEMBLY, WITH: 48 IN	320	03/17/2023	EA	4	\$0.00	\$0.00
40	R99990180		ABSORBENT; FORM: SHEET, TYPE: OIL, COMMONNAME: Oil Absorbent sheet	320	03/17/2023	RL	1	\$75.20	\$75.20
80	R38301617		SPRING, SWITCH; WOBBLE HEAD, SWITCH WAND, FITS: LIMIT SWITCH, LENGTH: 4-1/8 IN, MATERIAL: STEEL, USED ON: WESTINGHOUSE UNITS	320	03/19/2023	EA	3	\$35.34	\$106.02
80	R38301614		SWITCH, LIMIT; ACTION: 1/2 IN NPT, ACTUATOR: R38301617 - SPRING, BODY: 3SE03-SB, CONTACT ARRANGEMENT: 2NO-2NC, ENCLOSURE: IP67, FITS: WESTINGHOUSE ESCALATORS, HEAD: 3SE03-DM1, MOUNTING: SCREW, USED ON: WOBBLE HEAD, VOLTAGE: 120VAC	320	03/19/2023	EA	3	\$212.75	\$638.25
Total Actual Materials:									\$10,288.57

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03/21/2023 07:16

Attachment 10 – ELES repair work order page 5 of 6



Washington Metropolitan Area Transit Authority
 Maintenance and Material Management System
Work Order Details

Work Order #: 17742354
 Type: CM



Status: COMP
 03/20/2023 13:01

Work Description: INVESTIGATE THERMAL EVENT AT RIGHT SIDE OF DRIVE 1 ***material ordered
 Job Plan Description:

Failure Reporting			
Cause	Remedy	Supervisor	Remark Date
Remarks:			

Attachment 11 – ELES repair work order page 6 of 6

Appendix E – Fire Marshal Investigative Report



Washington Metropolitan Area Transit Authority
Department of Safety Office of Emergency Preparedness
Prevention and Mitigation Group

24-Hour Preliminary Investigation Report

Facility Name: C09 – Crystal City Rail Station
Inspection Report Number: 2023.031391.INV. C09.001
Date: 3/17/2023
Address: 1750 South Clarke Street, Alexandria, VA
Inspection Type: Partial Inspection Annual Inspection FM Global Inspection
 Re-inspection Construction Inspection QICO Inspection
Facility Type: Rail Station Parking Garage Non-Revenue Facility
 Rail Yard Bus Garage

- Date of incident:** 3/16/2022
- Time of Incident:** 20:59 hours
- Address of Incident:** 1750 South Clarke Street, Arlington, VA
- Location of Incident:** Main entrance escalators
- Prevention & Mitigation Specialist;** Fire Marshal [REDACTED], Prevention and Mitigation Specialist [REDACTED]
Employee ID: [REDACTED]
Time of Notification: 03/17/2023 @ approx. 12:00 noon
Time of arrival: 03/17/2023 @ approx. 13:00 pm
Time of departure: 15:00 pm
- Certified Fire Investigator:** N/A
Employee ID: N/A
Time of Notification: N/A
Time of arrival: N/A
Time of departure: N/A
- Was evidence collected:** Yes No N/A
- Evidence Status:** Was evidence obtained: Yes No N/A
Is evidence secured: Yes No N/A
Location: N/A
- Were photographs takes:** Yes No **Number of photographs:** 13

Attachment 12 – Fire Marshal Investigative Report page 1 of 2

10. **Were Field sketches completed:** Yes No
11. **Were interviews conducted:** Yes No
12. **Were there injuries:** Yes No
13. **Were there fatalities:** Yes No
14. **Preliminary overview of damage:** Damage was contained to the escalator mechanical area. Sprinkler deluge system activated and extinguished fire.
15. **Preliminary circumstances leading up to the event:** Unknown. Escalators were reported to be operating as usual.
16. **Preliminary findings:** Incident appeared to have been mechanical in nature. The only sustainable ignition source appeared to be mechanical. [Click here to enter text.](#)
17. **Preliminary hypothesis:** Upon reviewing the scene and speaking to representatives from ELES, the only probable ignition source appeared to have been friction heating as a result of mechanical failure.
18. **Preliminary determination:** Accidental, Incendiary, Natural, Undetermined
19. **Further actions:** None at this time. The final investigation will be completed by the Office of Safety Investigations (OSI).
20. **Interim safety recommendations:** None at this time

Attachment 13 – Fire Marshal Investigative Report page 2 of 2

Appendix F – Incident Photos



Image 1 - Drive sprocket (top right), idler sprocket (bottom) and drive sprocket stub shaft and bearing (top left). The idler shows signs of rubbing, it should have a white paint like the drive sprocket but has been worn off.



Image 2 - Stub shaft bearing showing it has been well greased.



Image 3 - Melted escalator step roller. Polyurethane wheel has melted away. Drive sprocket has signs or wear from rubbing on step track.



Image 4 - Damaged step roller, broken drive chain safety switch actuator arm and damaged escalator drive chains. Polyurethane has melted off both step roller, switch arm and drive chains on right side.



Image 5 - Closer picture of the damage to the escalator drive chains and broken chain actuator arm. Drive and idler sprockets show signs of wear from rubbing on step track.



Image 6 - Undamaged left side drive area. Notice painted finish on both sprockets.



Image 7 - Damaged right side drive area.



Image 8 - Escalator drive area for Drive #1. This escalator has 2 drives. Drive #2 is located further down the escalator. Drive #2 was unaffected.

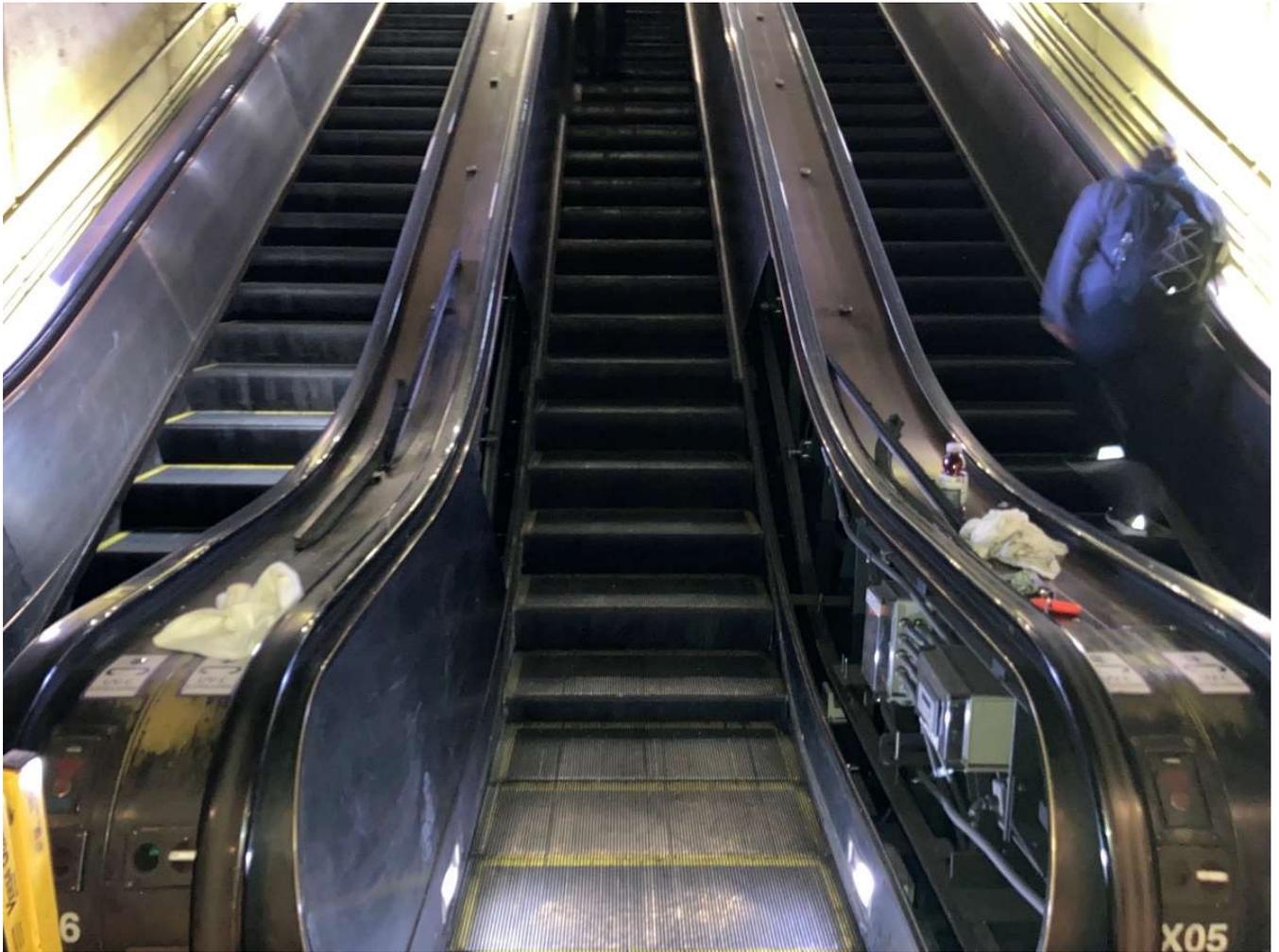


Image 9 – Affected Escalator X05 before repairs began.



Image 10 - Melted grease line for the stub shaft bearing.

Appendix G – Root Cause Analysis

E23179 – Evacuation for Life Safety Reasons – Crystal City Station

