

FINAL REPORT OF INVESTIGATION A&I E18544

December 4, 2018

Injured Employee

Adopted by the Metrorail Safety Commission at its meeting on July 11, 2019.

Washington Metrorail Safety Commission
777 North Capitol Street, NE, Suite 402
Washington, DC 20002



FINAL REPORT OF INVESTIGATION A&I E18544

SMS 20181205#76192

Date of Event:	12/4/2018
Type of Event:	Injury (Minor) Requiring Transport
Incident Time:	20:45 hrs.
Location:	CM L1 070+40 within L-Line Bridge Work Area
Time and How received by SAFE:	22:52 hrs., SAFE On-Call Phone
Safety Officer Response:	No
Time of Safety Officer Arrival:	N/A
Time of Safety Officer Departure:	N/A
Rail Vehicle:	N/A
Injuries:	Injured (Minor) Employee Transported
Damage:	N/A
Emergency Responders:	Systems Maintenance (SMNT) Supervisor

Executive Summary

On Tuesday, December 4, 2018 at 22:52 hrs., SAFE was notified by Mobile Command Center (MC) 10 of an employee injury which occurred at 20:45 hrs., that required medical transport from the scene. Based on further investigation, at approximately 20:45 hrs., a Track and Structures (TRST) employee was performing a chemical injection between L'Enfant Plaza station and the "L" line bridge metro rail stations (Right of Way). The TRST employee was accidentally splashed in the face with a chemical grout solution while repairing water leaks at Chain Marker (CM) L1 070+40 which is within the L-Line Bridge Work Area.

It was reported by the Track and Structures Supervision (TRST/S) that the type of Personal Protective Equipment (PPE) that was worn by the employee was an apron, composite toe boots, gloves, a hard hat, safety glasses, proper clothing and a safety vest. The condition of the PPE was unknown. The employee was immediately provided first aid and then transported to George Washington Hospital with non-life threatening injuries for further medical evaluation.

Considering all the salient facts, SAFE has concluded that this event was a result of human error and lack of procedural adherence. TRST management developed and distributed a lesson learned on January 17, 2019 to educate personnel on general work procedure for the specific job outlining proper PPE usage for the type of work to prevent reoccurrence of this preventable incident. See attachment 2.

Finally, there was no NICE Audio Recording System (ARS) or Close Circuit Television (CCTV) Video Recording available to support the investigation of this incident.

Notification

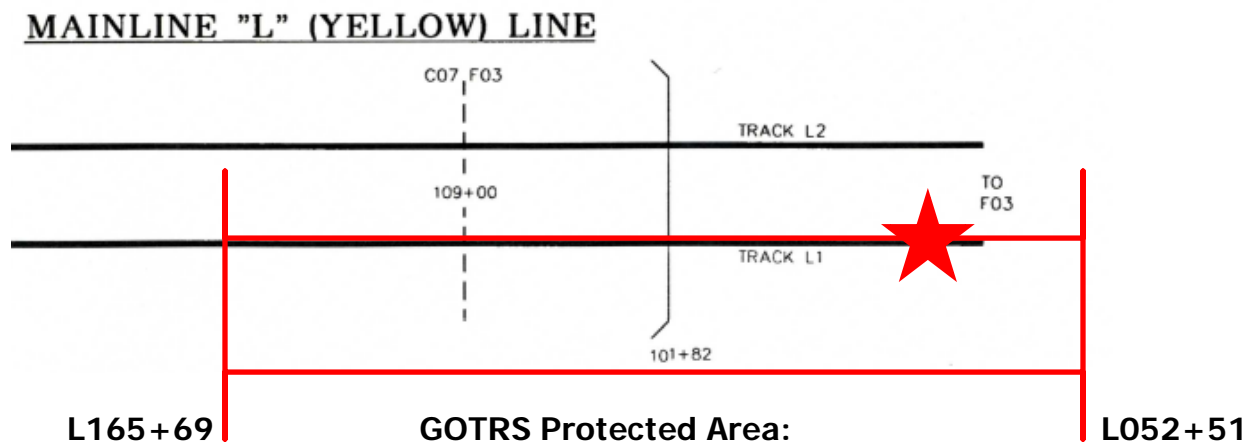
Title	Time	Comment:
FTA	23:08 hrs.	FWSO Email Notification
WMSC	23:08 hrs.	FWSO Email Notification

Incident Site

The incident area was located at Chain Marker (CM) L1 070+40. The area is described as a:

- Tangent track
- Direct fixation track
- Restricted view: curve as defined in Roadway Access Guide
- Inbound train movement
- 3000 feet inbound of portal area

Field Sketch/Schematics



GOTRS Work Limits

Track 1

Work Area: L057+51 to L160+69

Protected Area: L052+51 to L165+69

Investigation

On Tuesday, December 4, 2018 at approximately 20:45 hrs., a TRST employee was performing a chemical injection between L'Enfant Plaza station and the "L" line bridge metro rail stations (Right of Way). The TRST employee was splashed in the face with Avanti Grout Solution while working on leak mitigation, at CM L1 070+40, which is within the L-Line Bridge Work Area. See attachment 2, TRST Management Safety Meeting Lessons Learned Page 4 of 8. The TRST employee was splashed in the face when an injection port came out of the wall as the employee was removing the injection nozzle. Per the TRST manager on site, the employee immediately washed Avanti Grout Solution off the affected area with a water bottle near his location.

It was reported by the TRST Supervision that the employee was wearing Personal Protective Equipment (PPE). The type of PPE that was worn was an apron, composite toe boots, gloves, a hard hat, safety glasses, proper clothing and a safety vest. The condition of the PPE was unknown.

The employee was transported to George Washington University Hospital with non-life-threatening injuries. The employee was evaluated at the George Washington University Hospital where the medical staff discovered that the employee did not sustain any eye or skin injuries from the chemical and was discharged at approximately 23:15 hrs.

Per Attachment 2, TRST Management Safety Meeting Lessons Learned, Page 5 of 8, "A general work procedure was not issued for the type of work being performed". This means that there is no section that specifically pertains to working on leak mitigation duties in Metro Safety Rule and Procedures Handbook (MSRPH), but it is still part of TRST work duties.

ROIC Timeline

22:18 hrs., Systems Maintenance (SMNT) Supervisor notified Rail Operations Information Center (ROIC) that a SMNT employee was splashed in the face with a chemical solution while in the performance of his duties at CM L1 070+00. The incident occurred at approximately 20:45 hrs. The employee was transported to George Washington University Hospital with non-life-threatening injuries.

22:19 hrs., ROIC notified MOC Assistant Superintendent

22:25 hrs., ROIC notified Metro Transit Police Department (MTPD) dispatcher

Findings

- TRST failed to identify the potential hazards associated with tunnel water leak mitigation repairs
- George Washington University Hospital personnel evaluated employee and discovered no injuries due to the chemical contact
- A general work procedure was not issued for the specific job outlining proper PPE usage for the type of work
- There was no ARS or CCTV Video Recording available
- TRST personnel failed to utilize the Proper PPE in accordance to Safety Data Sheet (SDS) No 16719.

Weather

At the time of the incident, the temperature was 31°F, and partly cloudy. SAFE has concluded that weather was not a contributing factor in this incident. (Source: National Oceanic Atmospheric Administration (NOAA) for Washington, DC).

Immediate Mitigation

- Employee was removed from service as a result of this event
- Employee was transported to George Washington University Hospital for medical treatment
- The employee received re-instruction training during the TRST safety meeting for the preventable incident.

Conclusion

Based on the salient facts identified as part of this investigation, Metro Safety Rule and Procedures Handbook (MSRPH), GOTRS Report data, ROCC Timeline and TRST lesson learned document, SAFE has concluded this event was a result of human error and lack of procedural adherence.

1. TRST failed to identify the potential hazards associated with tunnel water leak mitigation repairs
2. TRST personnel did not issue a general work procedure for the specific job outlining proper PPE usage for the type of work
3. TRST personnel failed to utilize the Proper PPE in accordance to Safety Data Sheet (SDS) No 16719 in attachment 1, 1 of 4.

Considering all the facts gathered from this investigation, SAFE has no further information to reveal regarding E18544 and recommends its closure.

Corrective actions

1. TRST management developed and distributed a lesson learned on January 17, 2019. See attachment 2.

Attachment



SDS NO.: 16719	
	APPROVED Product Name: AV-275 Soilgrout Date: 5/15/2018
	
Product: AV-275 Soilgrout SDS No.: 16719	
SECTION 1 - Contact Information	
Contact Name	
Contact Phone	
Email Address	
Department / Office	TRST/STRC
Date	04/30/2018
SECTION 2 - Product Information	
Product Name	AV-275 Soilgrout
Manufacturer Name	Avanti International
Manufacturer Web Address	http://www.avantigrout.com
Vendor Name	Avanti
Physical State of Material	Liquid
Pressurized Container	No
Product Category	Adhesive / Sealant
Container Size	Pail/Bucket (Greater than 1 - 5 gallons)
Quantity use	4 per Month
What is the product needed for (purpose) and how is it applied?	Waterproofing hydrophobic foam. Pressure injected through tunnel walls into soil.
Location of Product Use	RAIL SYSTEM UNDERGROUND
Location of Product Storage	RAIL YARD SUPPORT FACILITY

Attachment 1 – Safety Data AV-275 Soil Grout Page 1 of 4

SECTION 3 - Material Status

Stock	No
Credit Card	Yes
Comments	This product is used to stop high flow leaks. It will be injected into the soil by means of "through wall" injection. Used with catalyst AV-276.

SECTION 4 - Hazards

Primary Hazard	H372 Causes damage to organs through prolonged or repeated exposure
Label	
Secondary Hazard	H315 Causes skin irritation
Label	
Primary Precaution	P260 Do not breathe dust/fume/gas/mist/vapors/spray.
Secondary Precaution	P271 Use only outdoors or in a well-ventilated area.
Signal Word	Danger
NFPA- Health: 2 Fire: 1 Reactive: 1 Special:	

SECTION 5 - Comments


General Comments	Follow all SDS/product label directions and the information presented in this evaluation. Keep container tightly closed when not in use. Wash skin and face thoroughly after use and practice good hygiene.
Special Comments	ENSURE THOROUGH VENTILATION OF WORK AREA. DO NOT BREATHE VAPORS OR MISTS. AVOID CONTACT WITH SKIN AND EYES. WEAR FACE SHIELD TO PROTECT FROM SPLASHING. PROTECT FROM MOISTURE.
PPE	Gloves, nitrile or neoprene Chemical-proof goggles Face shield

Storage	Keep in tightly closed and properly labeled container. Store in cool, well-ventilated area. Protect from moisture. Keep away from incompatibles.
Environmental Statement	METRO: ALL SPILLS MUST BE CONTAINED TO THE EXTENT POSSIBLE AND IMMEDIATELY REPORTED TO MOC AT (202) 962-1530. The Supervisor is responsible for using this product as intended, informing workers of the hazards associated with using this product, and using the correct Personal Protective Equipment (PPE) required to protect the employee against chemical and physical exposure. All users of this product must read this Evaluation and the SDS for this product prior to use and follow all instructions and precautions. Proper disposal of this product is required. Contact EMIH for disposal of bulk, unused or off-spec product.


Attachment 1 – Safety Data AV-275 Soil Grout Page 3 of 4

WMATA SDS Number: 16719

AV-275 Soilgrout


 Signal Word: Danger
 Primary Hazard Statement:
 H372 Causes damage to organs through prolonged or repeated exposure

Primary Precautionary Statement:
 P260 Do not breathe dust/fume/gas/mist/vapors/spray.
 NOTE: For a complete list of Hazard and Precautionary Statements Refer to the WMATA Approved SDS.




WMATA SDS Number: 16719

AV-275 Soilgrout


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Attachment 1 – Safety Data AV-275 Soil Grout Page 4 of 4

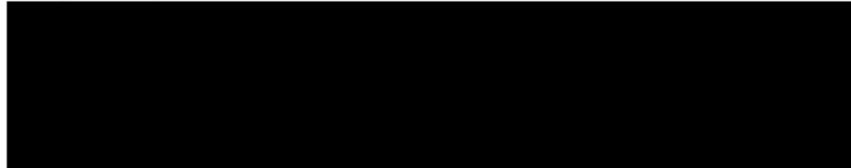
Subject: Management Safety Meeting with TRST
Location: Alexandria class room #1

Start: Thu 1/17/2019 5:30 AM
End: Thu 1/17/2019 6:30 AM
Show Time As: Tentative

Recurrence: (none)

Meeting Status: Not yet responded

Organizer:
Required Attendees:



Mandatory-Staff Safety Meeting
Meeting location has been moved to Classroom #1. 1st floor Alexandria TRST building

Attachment 2 – TRST Management Safety Meeting - Lessons Learned Page 1 of 8



MEETING MINUTES FOR Thursday 17th, 2018

Meeting was called to order by [REDACTED] at 5:31 am

Safety Contact – Be mindful that once the snow melts and refreezes it can be slippery. Also be mindful of snow on rooftop, when entering buildings and home it melts and slides off of buildings and can hazards to your head

[REDACTED] talked about Values on the job, **teamwork** - we want to score points, **respect** - The last 6 months being very involved with crews and individuals, the respect level has changed a lot, one of the things I remember when I started here was the respect that they had for one another, we must keep in mind to respect one another as employees

Accountability – Metro went through a world wind of things happening, we have people here floating around and you don't even know what they do. You see them all the time stop and have a conversation. Our people are being involved in different things but at the end of the day you must do our jobs. Be accountable for what you are here for. So, again accountability for each craft, each position and each work assignment. I don't know what happened to the department over the years, but it uses to be very strong, productive and organized, but now it's up to us to continue the teamwork to make us accountable.

Not Just A Job – We can't go to the 7-11 and get a guy to come help us. we can't go to the grocery store and get somebody to help us with our job. All of us in here are professionals you cannot go just go anywhere and get the somebody to do the job we do. You are trained skilled professional who are doing a unique job, so take heed to that because you become experts in your craft in what you do, you become a commodity to the origination and yourself.

Safety – That's why we are here today, structures fell off with communicating our safety efforts. Prior structure managers took safety meeting for granted. We didn't have any meets. we didn't have much discussion about it even with things happening within our own group. We had an incident that injured one of our employees at the L-line chemical injection. Does everybody know about that ? We immediately constructed a lessons learned and informed the group of what happened. Our objective was it to be transparent, protective with notification and awareness. I did not want the next shift or any employee putting themselves in the same situation that caused the incident. We all understand and should know that face shields and safety goggles are protective equipment "101" for drilling

and injecting. Everyone received or reviewed a copy of the draft bulletin that was put together, so you knew something happen to our people out in the field and we could mitigate the situation right away. I will always put something out right away, just the basic information so that you could alert your crew immediately.

Integrity – a lot of time when you are assigned to go out and do a job with your crew, we need to get back in making sure we have great integrity about we are going to go and do what we need to do we are going to give it our best effort to correct the situation we are working on trying to get our crew back to being infinitive and taking pride in our profession. We don't have people looking over our shoulder or per say but going to do a good job for yourself and your crew means a lot about that person and their integrity. So, have good integrity when you are doing your work or when you out doing work with your crew

Trust – a lot of time when I was working with track I would get call about a lot of stuff and I am not able to always go out and look at everything but I will trust you're their judgement, I will trust from their training that the information that they are giving me to hold value on what they are telling me because I have to report back to someone else, so If I call you or ask you question and we talk about stuff even with managers or with your crew trust that they will be giving you the right information. How would you look if I asked you a question about what you are doing or whatever worksite it was about, and you just kind of vaguely told me what you thought I wanted to hear and I went back and reported that to Roy well when Roy finds out that what I told him wasn't true or really not what happened what do you think he's going to think of me? He's going to think that every time I tell him something it's not true, so he's going to go around me and go to the source. He's not going to have any trust in me and I'm not going to have much trust in you, so you see how this will go in a circle ? so, if you don't know say you don't know, be honest and truthful.

Take one of these letters and try to use it in your daily work day

Floor was open for discussion:

- Being respectful of parking along the side with work truck leaving the mirror out where another vehicle can hit/side swipe it. If a vehicle isn't in use pull the mirror in to avoid accidents.
- Stop leaving extension cords plugged in sockets after your shift ends
- Work plans needs to get better for the next shift that comes in even on a short notice
- Tools and Equipment needed

Attendance signature sheet attached >>>

	TRST STRUCTURES MAINTENANCE TRACK MAINTENANCE PRACTICES		
	TRST	Lessons Learned Employee Chemical injection into Steel Liner	SMS 20181205#76192



Summary of Incident

On December 4, 2018 at approximately 0845 PM, a STRUCTURE MAINTENEACE employee was performing chemical injection between L'Enfant Plaza station and the "L" line bridge metro rail stations (Right of Way) During the midnight shift assignments. At approx. chain marker L-1 70+00. A structures maintenance work crew was assigned to an onsite training session with the product vendor for chemical injection of deteriorating steel liner within the tunnel section of the ROW. While the maintenance crew was utilizing a electrical powered injection pump, when a injection port blew out and caused the pressurized chemical to blow back onto a employee The injection port had become dislodged from the steel liner structure while the injection processed was stopped. The pressurized chemicals made contact with the employee face and frontal body area, including facial hair, covering his protective safety glasses and Tyvek safety suit.

Page 1 of 4

Attachment 2 – TRST Management Safety Meeting - Lessons Learned Page 4 of 8

Employee on site immediately deactivated the equipment and provided water for raising off the employee involved.

The Supervisor was within close range of the incident and was an eye witness to the incident as it occurred. The Supervisor assisted removing employees clothing and equipment from this employee. The Supervisor immediately transported the employee to the hospital (George Washington Hospital N.W. D.C.) Maintenance Manager notified the RWIC of the work site and reported the incident. Based on the degree of injury emergency medical services was provided to the employee at the attending hospital. The employee was treated and released from the hospital with hours.

The employee was escorted to his reporting location by his supervisor and proceeded to leave off the property.

Contributing Factors:

The initial investigation recommends that the following were contributing factors to the incident:

- I. A general work procedure was not issued for the type work being performed.
- II. Improper deactivation process was not being followed
- III. Proper safety equipment was not being utilized.

	TRST STRUCTURES MAINTENANCE TRACK MAINTENANCE PRACTICES		
	TRST	Lessons Learned Employee Chemical injection into Steel Liner	SMS 20181205#76192

Learned Lessons

- A. Employee should have monitored the injection pump pressure, before attempting to remove the injection pump nozzle.
- B. Employee should have been wearing proper personal protective equipment (PPE) for the assigned task

Supervisor Should have evaluated the work process and proper PPE was provided and assigned for type work being performed.

Helpful Links:
Product features
[www.dupont](http://www.dupont.com) TY122s



- Serged seams, attached hood, front zipper closure, elastic wrists, and attached boots.
 - Inherent barrier protection against dry particulate hazards.
 - Applications range from agriculture to spray painting to lead remediation, hurricane clean up to fall clean up.
 - Even after abrasions, stops microporous particles better than other reusable garments.
- The best balance of protection, durability and comfort. Comes with Exclusive InPrimeTime protective gloves

Polycarbonate Face Shield : [www.polycarbonate face shields.com](http://www.polycarbonateface Shields.com)



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Attachment 2 – TRST Management Safety Meeting - Lessons Learned Page 7 of 8

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