

**Massachusetts Bay
Transportation Authority**

Safety Event Investigation Accomplishments

MBTA Board of Directors – SHE Sub-Committee

June 9, 2022

Steven V. Culp, Chief Investigation Officer – Safety

Investigation Team – Safety Panel Report

- Excerpts from Safety Panel Report:

- ❖ “The MBTA Safety department is responsible for producing the agency’s final accident investigation reports; however, there is only a single person within the Safety department’s accident investigation team that can be considered a SME. This individual has Transportation Operations experience. Therefore, the Safety department cannot lead an independent, comprehensive accident investigation, and this inadequacy is even more pronounced for events centered around M&E issues.”

- ✓ MBTA Safety has added seven (7) SME’s that cover multiple disciplines raising the level of expertise for investigations and field presence.

- ❖ “In addition, there is essentially no safety personnel present once the day-shift ends. The SRP was told that one safety person works the PM shift and there is an “on-call” person for the mid-night tour. In the event of an incident, senior Safety department personnel will respond to the scene depending on the severity of the incident. This once again illustrates that the Safety department is reacting to lagging indicators, as opposed to proactively championing safety in the field.”

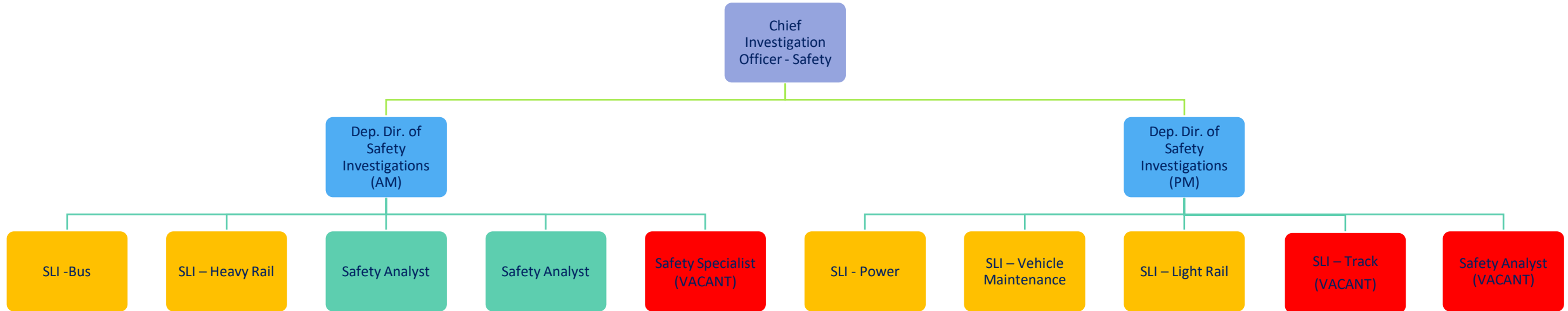
- ✓ MBTA Safety has 24/7 shift coverage including weekends with 2nd, 3rd, and weekend shifts being staffed primarily by Investigation Team.

- ❖ “The MBTA should benchmark accident investigation practices utilized by their peers and adopt the practices best suited for the T. “

- ✓ MBTA developed an updated Safety Event Investigation Manual

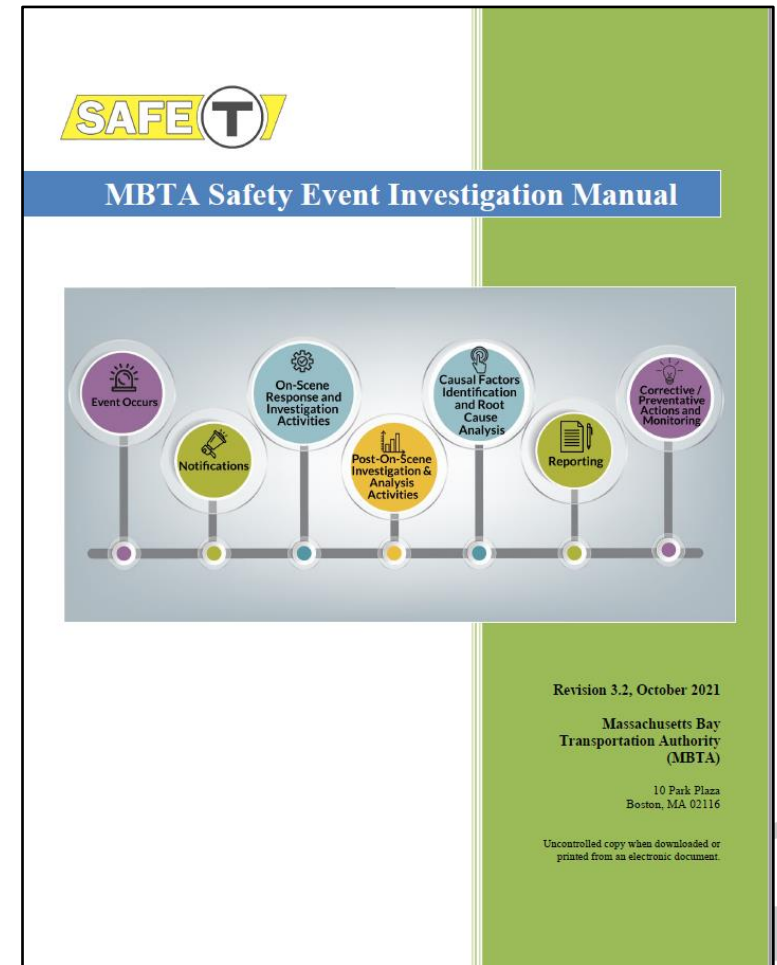


Investigation Team – Safety Lead Investigators



Safety Event Investigation Manual

- Developed January 2020 to November 2020
 - Updated October 2021
- Utilized MBTA previous manuals, best practices from other agencies, and APTA guidance documents.
- Developed in coordination with multiple MBTA Departments and approved by senior leadership
- Shared with all departments and published on MBTA's internal employee website TSTOP
- Developed Safety Event Investigation Training



Investigation Training Accomplishments

Training Module Name

- | | |
|--------------------------------------|--|
| 1. Agency Leadership (Exec. Mgmt.) | 13. Power Familiarization |
| 2. Employee Injury Response | 14. Bus Transportation Familiarization |
| 3. Safety Event Response Team (SERT) | 15. Rail Transportation Familiarization |
| 4. On-Scene Signals | 16. Rail Vehicle Maintenance Familiarization |
| 5. On-Scene MOW | 17. On-Scene Safety Responder |
| 6. On-Scene Power | 18. Photographing the Scene – Part A |
| 7. On-Scene Bus Transportation | 19. Photographing the Scene – Part B |
| 8. On-Scene Rail Transportation | 20. Sketching the Scene |
| 9. On-Scene Rail Vehicle Maintenance | 21. Post-On-Scene Investigation Activities |
| 10. Effective Interviewing | 22. Causal Factors and Root Cause Analysis |
| 11. Signals Familiarization | 23. Report Writing and Mitigating Actions |
| 12. MOW Familiarization | |

Training Roll Out

- General Manager/Deputy General Manager
 - December 2020 – Modules 1 & 2
- MBTA Safety Employees
 - January to April 2021 – All Modules
- All MBTA Departments
 - April to June 2021– Area Specific Modules

Full Implementation of new Safety Event Investigation Manual began in July 2021



Investigation Team Accomplishments

Year	Accident Investigations	Derailment Investigations	Corrective Action Plans Developed
2019	29	32	4
2020	25	21	9
2021*	65	12	28
2022 - YTD	33	12	15

* In 2021, the Massachusetts Department of Public Utilities added State Reportable criteria above what is mandated by the Federal Transit Administration.



Investigation Team Accomplishments

- Emergency Response - Saturday, February 6, 2021, 4:30 am: Fire and/or Smoke Event in a power utility room.
- SLI heard of the event at a Red Line Traction Power Station 600 VDC transformer while monitoring radio transmissions.
- SLI arrived on-site within 9 minutes to collect firsthand information of the event from the Power Department and Boston Fire.
- MBTA Safety updated key stakeholders that a 600 VDC breaker issue occurred during planned work.
- MBTA Safety was able to obtain real-time photographs and investigate extent of damage.



Investigation Team Accomplishments

- Emergency Response – Monday, January 25, 2021, 4:10am: Infrastructure Damage.
- SLI responded to Forest Hills within 15 mins. for a pipe burst in the upper busway that created a slip, trip, and fall hazard for customer and employees.
- SLI used his bus expertise to coordinate Officials and work crews to ensure bus, busway, and station egress safety,
- The areas were monitored and coned-off, as an E&M lift truck cleared the overhead hazards and sanded/salted the area while the plumbers repaired the broken pipe.



Investigation Team Accomplishments

- Type 14 Derailment – Main Line – March 16, 2021
 - Investigation concurrent with the February 8 & 21, 2021 derailments in Wellington Yard
- Entire Fleet of OL Type 14 Vehicles taken out of service
- Multi-departmental investigation, including Vehicle Engineering.
- The probable cause of this incident was determined to be an expedited decomposition of the cellulose fiber within the Side Bearer Pads at a continuous operating temperature significantly lower than those expected within manufacturer specifications.
- The degradation of materials increased static friction that created an exceptionally high rotational resistance unable to withstand the lateral forces generated in low-speed curves.
- Fleet replacement of Side Bearer Pads and Switch Modifications were performed to return vehicles to service in August 2021.

