



Washington Metrorail Safety Commission

Finding that requires Metrorail to propose a Corrective Action Plan (CAP)

August 13, 2021

Overview: The WMSC’s safety audits, other regular oversight activities, and additional investigation conducted in coordination with WMATA’s Office of Inspector General have identified that although Metrorail has dedicated significant resources to the Silver Line Phase 2 safety certification process, Metrorail is not following this crucial safety process in many other projects that also require safety certification. This process is required by Metrorail policies and procedures.

As described below, this finding requires Metrorail to develop and implement systemic corrective actions to ensure that these processes are followed moving forward, and to mitigate hazards related to specific projects that have been put into service without incorporating these layers of safety. Metrorail is required to propose a specific corrective action plan within 30 days.

When properly carried out, safety certification ensures that new equipment and infrastructure are designed, tested and placed into revenue use incorporating WMATA’s own design criteria, any additional safety requirements, and any other safety mitigations to address hazards identified during project development and implementation. As WMATA’s current Safety and Security Certification Program Plan (SSCPP) explains, the entirety of the process, when properly carried out, is intended to ensure that:

- “Design and operating hazards and security vulnerabilities are identified, evaluated and properly controlled or mitigated prior to the commencement of passenger service consistent with WMATA’s SRM processes;”
- “Critical system elements are evaluated for compliance with identified safety and security requirements during the design, construction/installation, testing, and start-up phases of a project; and”
- “WMATA facilities, vehicles, equipment, and systems are operationally safe and secure for customers, employees, emergency personnel and the general public, prior to entering, or re-entering after modification, revenue service or use by WMATA personnel.”

This requires a comprehensive approach to each project from start to finish that includes all relevant subject matter experts and that follows all requirements laid out in Metrorail’s safety plans based on the type or complexity of that project.

Among other benefits, safety certification limits the risk of costly and disruptive changes being required later, and produces carefully reviewed and approved documentation. Without such documentation, Metrorail cannot ensure that hazards are properly identified and mitigated through project changes, proper training for personnel and other steps. This creates an increased risk of collision, derailment or other safety events that can cause damage, injuries or fatalities. To ensure the safety of its customers, employees, contractors and first responders, Metrorail must take action to institutionalize and carry out the safety certification requirements of its SSCPP (Revision 4, dated January 2020; initial version issued July 2003).

These requirements are built on federal rules and regulations, guidance from the Federal Transit Administration, and requirements set by the WMSC.



Systemic Safety Certification Deficiencies

Although WMATA has put an emphasis on efforts to properly complete the safety certification process for large, new construction projects such as Silver Line Phase 2, Metrorail has put other assets into service in the existing Metrorail system without required Safety Department approval and even without the Safety Department even having knowledge of the projects. This is despite Metrorail designating the Safety Department as responsible for safety certification.

The WMSC has raised specific safety certification deficiencies to Metrorail on multiple occasions over the last six months, including through findings requiring Metrorail to develop Corrective Action Plans (CAPs) issued earlier this year in the Roadway Maintenance Machine (RMM) Audit and Automatic Train Control (ATC) Audit. For example, the WMSC's ATC Audit identified that Metrorail had proceeded with work related to automatic door operation and Automatic Train Operation without following Metrorail's safety certification procedures. Metrorail proposed and the WMSC approved corrective actions for these findings that specifically addressed the issues within the scope of those audits. Based on the WMSC's additional oversight work, broader corrective action is required.

The WMSC has identified additional safety certification deficiencies through ongoing work including the Revenue Vehicle (Railcar) Audit (draft report transmitted to WMATA), Traction Power Audit (draft report being finalized), and regular safety certification oversight of the nearly completed Alexandria Rail Yard ATC project.

Despite the WMSC's ongoing communication with WMATA highlighting these important safety deficiencies, Metrorail has not ensured that all departments fully implement Metrorail's safety certification requirements documented in WMATA's SSCPP for all projects. This has created safety risks for riders, workers and first responders.

For example, Metrorail's failure to follow its safety certification processes directly contributed to the pull-aparts of two 6000 Series trains on the Red Line in fall 2020. The safety event investigations (W0079 and W0080) adopted by the WMSC in May 2021, and additional document reviews and interviews conducted for the Railcar Audit, identified that 6000 Series rehabilitation work, including on the railcars' couplers, was planned and implemented without internal safety reviews and approvals required by the SSCPP.

The WMSC's ongoing Traction Power Audit work has demonstrated that Metrorail is activating systems without Temporary Use Notices (TUNs), cutting over power prior to receiving Safety Department and related approvals that are required by Metrorail's SSCPP. This includes equipment installed as part of the Red, Green and Orange Line Traction Power Upgrade project. Metrorail's SSCPP states that "A Temporary Use Notice (TUN) must be issued for that facility or system prior to use by WMATA personnel and contractors: When the facility or system is under the control of the contractor/vendor; and the facility/system is to be used by others; and On any portion of the current WMATA system." The SSCPP requires each party involved in the temporary use to sign the TUN prior to the facility or system being used, and states that if restrictions noted on a TUN are not followed then the facility or system must be taken out of service. The SSCPP does not include specifics regarding how these signature approvals must be determined and obtained.

In one of the most recent cases of Metrorail's failure to follow its safety certification processes, the WMSC has learned through discussions with Metrorail personnel, a review of documentation,



and additional investigation conducted in coordination with the WMATA Office of Inspector General, that Metrorail reactivated the Alexandria Rail Yard (C99) Automatic Train Control (ATC) system over the safety-based objections of Metrorail's subject matter experts, the ATC Engineering Department. The Alexandria Rail Yard train control and signaling system rehabilitation project has been conducted under what was initially a four-year contract issued in January 2019. In summer 2020, Metrorail accelerated the schedule with the goal of completing the project in fall 2021. This project development and subsequent complete reactivation in May 2021 was conducted outside of the safety certification process, including by not initially conducting an effective preliminary hazard analysis, by not including reliability and maintenance requirements in the contract and planning, and by later activating areas of the yard without the required sign offs and approvals.

Documents reviewed by the WMSC demonstrate that individuals in or reporting to Metrorail's Capital Delivery Department (CAPD) circumvented numerous required approvals for technical submittals that are required to determine whether the systems are safe to use. This includes a CAPD Signal System Renewal Program (SSRP) group contractor both approving and distributing a contractor submittal within two minutes without providing an opportunity for an engineering review, and CAPD approving and distributing a submittal related to programming of MicoLok Application Logic without including ATC Engineering review and approval as required for ATC software applications.

Metrorail's SSRP put the final portion of the yard back into service, and the Safety Department approved a TUN, in late May 2021 without ATC Engineering's required approval and despite ATC Engineering stating that there was insufficient safety review and documentation. The Office of Engineering and Architecture (ENGA), which oversees ATC Engineering but does not have ATC subject matter expertise, signed off anyway.

The TUN approval was issued just prior to the closure of the Green and Yellow Lines north of Fort Totten that cut off the Greenbelt Rail Yard from the rest of the revenue system for summer 2021, which required the increased operational use and restoration to service of the Alexandria Rail Yard to avoid operational disruptions. This was also just prior to additional specific TUN approval requirements in the WMSC's updated Program Standard that became effective June 1, 2021.

WMSC inspections of the Alexandria Rail Yard, including on July 21, 2021, demonstrated that Metrorail has implemented some temporary safety mitigations, such as limiting two switches to manual operations and establishing a fire watch, that are specified in the May 2021 TUN. These are among mitigations identified in an operational hazard analysis that associated documentation demonstrates was only completed on the day the TUN was issued. Under the SSCPP, Metrorail should have conducted a complete preliminary hazard analysis at the beginning of the process as part of the safety certification requirements to ensure all hazards are identified and appropriately mitigated, rather than only attempting to determine operational hazards and mitigations at the time that portion of the yard was being activated and after design and installation was substantially complete. A very limited preliminary hazard analysis produced by the construction contractor that was provided to the WMSC related specifically to contractor work during the construction process, with only a single reference to any hazards that might need to be mitigated after construction was complete. This sole long-term reference related to the need for delivery of operations and maintenance manuals to WMATA. The document dated May 2019 and updated in November 2019 was listed as a preliminary hazard analysis, certifiable items list



and hazard tracking log combined, rather than as separate documents. The SSCPP requires a systematic approach to hazard management, and the evaluation and resolution of safety hazards at the earliest possible phase of the project.

Following the WMSC raising specific concerns related to the Alexandria Rail Yard, Metrorail acknowledged changes are required to ensure that subject matter experts, such as ATC Engineering, are not bypassed in the safety approval process for someone higher in the chain of command who is willing to sign off despite a lack of technical expertise in the relevant area.

In addition, WMSC discussions with Metrorail's ATC Engineering experts identified safety concerns related to the process and requirements used and safety steps required for the ATC system related to the Potomac Yard Station that is under construction on the Blue and Yellow Lines in Alexandria. These concerns included that the contract did not include, and Metrorail did not initially follow, all requirements to ensure that the track circuit design aligned with Metrorail's ATC design criteria. On July 26, 2021, Metrorail publicly acknowledged these safety certification deficiencies, and Metrorail announced that the station's scheduled opening is now delayed from early 2022 to late 2022.

In another example of a preliminary hazard analysis dated well after project work had begun, which led to hazards not being addressed in a timely fashion, a PHA for the tunnel ventilation improvement pilot project on the Red Line was documented only after the WMSC requested additional documentation on the project during the WMSC's ongoing Emergency Preparedness and Fire-Life Safety Audit. The WMSC requested this and other additional documentation related to the project on August 6, 2021, and the PHA was dated August 9, 2021. Major construction had begun weeks earlier, and designs had begun years earlier. During a site visit, the WMSC observed a hazard of obstructed emergency egress due to the installation of columns in the path of the existing stairs to and from the emergency catwalk. In response to additional follow up requests specific to whether a catwalk extension and new stairs to maintain a clear egress path that had been included in earlier designs would be included in the project, Metrorail stated that the Safety Department's safety certification group "was not included in the review of the RFP design documents" and that "WMATA is in the early stages of evaluating design options to address this hazard."

The general lack of understanding across Metrorail as a whole of the critical importance of safety certification to identify hazards and mitigate risks, and the lack of authority demonstrated by the Safety Department to control this process, have contributed to Metrorail's circumvention or other lack of compliance with safety certification requirements. These systemic issues identified across multiple departments and projects require a holistic solution to ensure that these safety processes are followed and have the intended effect of improving safety through proper design, documentation, reviews and training.

WMSC Finding: Metrorail does not consistently follow its safety certification process, which leads to project activation and use without proper hazard identification and mitigation, putting Metrorail customers, personnel and first responders at risk.



Minimum Corrective Action: Metrorail must clearly communicate requirements of, and take active, recurring steps to ensure compliance with, its safety certification procedures and processes from the initiation of a project through project completion, activation, final verification and acceptance.

This includes the involvement and awareness of the Safety Department when each project is being proposed, developed, funded and implemented, which requires involvement when any related contracts are being developed, when actual work is underway, and when work is completed. Metrorail employees, such as department leaders, project managers, submittal reviewers, and procurement staff, who are involved in the development and implementation of contracts and projects that may require safety certification must be trained on safety certification processes and requirements. As specified in the SSCPP, for many projects, this requires beginning the safety certification process at the beginning of a project, leading to the development and use of a comprehensive certifiable items list (CIL) and certifiable elements list (CEL) based on complete and regularly updated hazard analyses, detailed review by safety working group(s) including all relevant departments and subject matter experts, and all required final sign offs prior to activation.

Metrorail must develop and implement a process to ensure that all relevant subject matter experts review and approve submittals or test reports and documentation such as Temporary Use Notices (TUNs) prior to the activation of the asset or system, and to ensure that required subject matter expert approvals are not bypassed.

As part of a self-assessment to identify and resolve specific gaps in the safety certification process, Metrorail must also assess and document whether this process has been complied with for each project put into service (with or without a TUN or certificate of compliance) in 2020 and 2021 and any other project allowed to continue in service following a TUN's end date in 2020 and 2021. Metrorail must specify mitigations and corrective actions for each project that did not comply with this process to address the hazards and risks introduced due to a lack of compliance with the process and to address any other hazards identified during the assessment of each project.