

The Washington Metrorail Safety Commission

Safety Audit

of the Washington Metropolitan
Area Transit Authority



**Audit of the Department
of Rail Transportation: Rail
Operations Control Center**



**Final Report:
September 8, 2020**

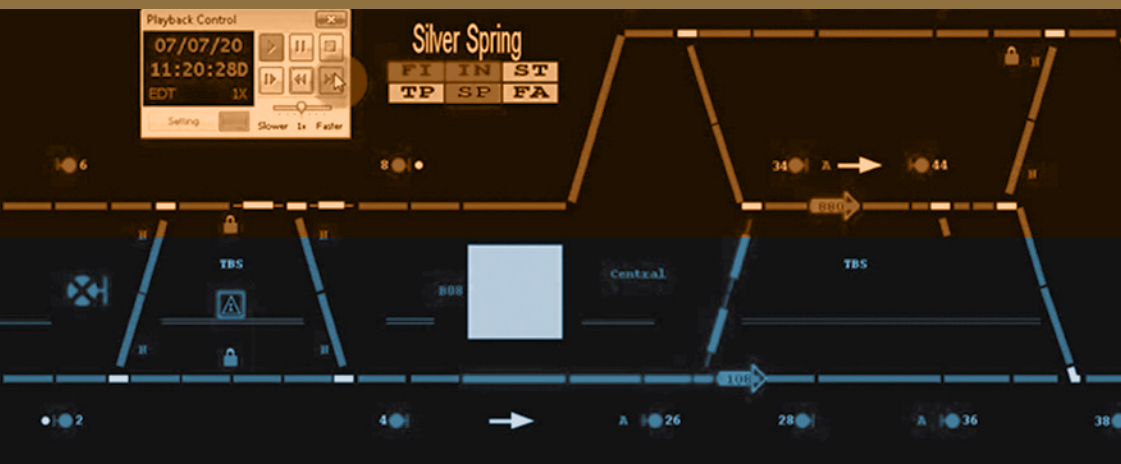
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Executive Summary

The ROCC's environment includes distractions, fear, threats and conflicting instructions that prevent overworked and undertrained controllers from fully and properly carrying out their duties.



Despite fatal accidents such as the 2009 collision near the Fort Totten Station and the 2015 smoke accident near the L'Enfant Plaza Station, numerous National Transportation Safety Board (NTSB) and Federal Transit Administration (FTA) reviews, and other investigations, reports and audits that repeatedly raised alarms, this audit demonstrates that still, in 2020, Rail Operations Control Center (ROCC) management has not created an effective safety culture.

Because the ROCC is responsible for overseeing train movement on mainline tracks, track access, power restoration, communications and emergency response, it is integral to the safety of riders, workers and first responders.

Yet the control center's environment includes distractions, fear, threats and conflicting instructions that prevent overworked and undertrained controllers from fully and properly carrying out their duties. These serious safety concerns create a variety of safety risks for everyone who depends on Metrorail.

The WMSC has already issued four findings requiring corrective actions in the ROCC since December 2019 based on investigative and audit work. The WMSC spent more than seven months directing revisions to Metrorail's proposed corrective actions to address those findings. Metrorail has recently appeared to finally be making some progress, but has yet to develop fully acceptable plans that will truly address these safety issues.

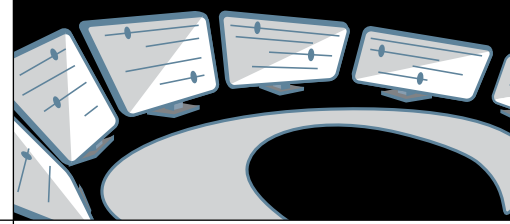
The WMSC is now issuing 21 more findings requiring corrective actions as part of this audit report based on extensive interviews with ROCC employees, discussions with Metrorail management, reviews of documents, and other audit work.

Metrorail must address a toxic workplace culture in the ROCC that includes racial and sexual comments, harassment, and other unprofessional behavior such as attempts to manipulate safety event investigations that create unacceptable safety risks.

Metrorail has not followed its own fatigue management policies that require at least one day off per week, has not addressed recurring safety issues, and has not implemented adequate recruitment, hiring and training practices.

The number of certified Rail Traffic Controllers (controllers) is essentially unchanged from five years ago despite a significant stated focus and effort on ROCC recruiting, retention bonuses and Corrective Action Plans (CAPs) intended to address significant staffing shortfalls.

Controllers who do complete training face additional challenges on the job due to repeated, sometimes conflicting, direction from management to ignore safety procedures taught in the months of classroom sessions.



All of this undermines morale and contributes to a high rate of staff turnover in the ROCC, critical staffing shortages that continue to adversely affect operations, and a lack of institutional knowledge that could help address safety challenges or emergency situations.

After a December 10, 2019 smoke event on the Red Line, the WMSC issued a finding on December 20, 2019 that “dysfunction in the ROCC during unplanned events and emergencies that includes yelling, conflicting instructions, and the failure to use checklists detracts from the ROCC’s ability to manage the rail system appropriately and effectively.”

The WMSC then accelerated a previously planned audit of Metrorail’s Department of Rail Transportation (RTRA), including the immediate focus on the ROCC described in this report.

Based on concerns identified during this work and related investigations, the WMSC directed Metrorail on May 12, 2020 to provide proper and complete training and information to controllers on the use of emergency ventilation fans, to prohibit ROCC managers from remotely controlling consoles without coordinating with controllers, and to institute additional protections to ensure third rail power is only restored when it is safe to do so.

Following those findings and additional discussions with Metrorail leadership, Metrorail reassigned the director of the ROCC in June 2020 to a position outside of the facility.

Despite some possible steps forward, Metrorail has not accomplished the necessary cultural change in the ROCC.

Metrorail has not accomplished the necessary cultural change in the ROCC.





Background and Scope

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WMATA's Rail Operations Control Center (ROCC) is responsible for directing all train and personnel movement within Metrorail's mainline right of way 24 hours a day, 7 days a week. Beyond train movement, the ROCC plays a crucial role in numerous other procedures including the removal and restoration of power, emergency response and critical aspects of Roadway Worker Protection.

The ROCC's primary location is within WMATA's Carmen Turner Facility (CTF) in Landover, Maryland. The backup facility is at WMATA's Jackson Graham Building (JGB) in Washington, D.C.

In addition to the rail traffic controllers and their managers, there are also other desks in the ROCC including the Rail Operations Information Center (ROIC) focused on communications with customers and station managers, and the Maintenance Operations Center (MOC) desks covering power, Automatic Train Control (ATC) and signals, car maintenance, elevators and escalators, and communications.

The ROIC is responsible for coordinating station operations with station managers, making public address announcements, monitoring for delays or abnormal operating conditions, acknowledging certain alarms, sending digital alerts and communications to customers or other departments, and updating the passenger information display system (PIDS), among other duties.

Another desk in the ROCC, the fire liaison, is staffed by uniformed officers of local fire departments 24/7 to assist with emergency communication and coordination between the ROCC and first responders.

This audit focuses on all ROCC operations, rules, procedures and training, and related sections of the Metrorail Safety Rules and Procedures Handbook (MSRPH). These are integral to WMATA's System Safety Program Plan (SSPP) in effect during this audit (adopted in 2018), which details steps Metrorail takes to ensure the safety of riders, employees, contractors and first responders.

Audit Work

The WMSC began work related to this audit in January 2020 and conducted interviews and received follow-up documentation through July 2020.

Due to the COVID-19 public health emergency, Metrorail began using the JGB ROCC facility on an alternating basis with the CTF ROCC facility in March 2020 as part of a health safety strategy intended to minimize face-to-face handoffs and cross contamination, and to provide time for disinfection work by alternating shifts between the two facilities. On May 27, 2020, a fire on the upper floors of JGB closed the JGB ROCC facility for several days. Controllers resumed use of that facility on June 1, 2020.

This audit focuses on all ROCC operations, rules, procedures and training.



“Dysfunction in the ROCC during unplanned events and emergencies that includes yelling, conflicting instructions, and the failure to use checklists detracts from the ROCC’s ability to manage the rail system appropriately and effectively.”

Metrorail ended the alternating shift schedule and returned to regular ROCC operations on July 19, 2020. Metrorail later established a weekly shift at the JGB facility to allow for cleaning at CTF.

Temporary changes due to the public health emergency are not a focus of this audit and are being assessed as needed through ongoing WMSC oversight activities. However, the continued availability of a fully functional backup facility is of importance to the WMSC for circumstances such as the fire that forced active controllers to transfer all responsibilities to the other facility.

May 2020 Findings

While conducting this audit, the WMSC issued three findings on May 12, 2020 related to a series of safety issues in the ROCC that, if not resolved, will continue to pose unacceptable risk for Metrorail customers, employees, and contractors.

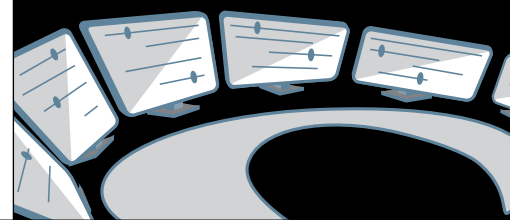
Metrorail’s General Manager and Board Chairman sent a joint letter to the WMSC on May 27, 2020 in response to the May 12, 2020 findings, and Metrorail later provided several draft Corrective Action Plans (CAPs) that the WMSC returned for further revisions.

Metrorail’s revised draft plans to address ventilation fan training, power restoration issues and remote console manipulation are promising.

The May 12 findings followed a separate finding issued on December 20, 2019 as a result of the investigation into a smoke event on December 10, 2019: “Dysfunction in the ROCC during unplanned events and emergencies that includes yelling, conflicting instructions, and the failure to use checklists detracts from the ROCC’s ability to manage the rail system appropriately and effectively.”

Metrorail spent months proposing CAPs that were not responsive or not fully responsive to the December 20 finding. After significant additional direction from the WMSC, WMATA submitted another draft corrective action plan for this CAP in July 2020 that showed real potential for progress.

The WMSC investigation into that December 10, 2019 event found striking similarities to the January 12, 2015 fatal electrical arcing accident near L’Enfant Plaza Station, and led the WMSC to change originally planned audit schedules to advance this audit work related to the Office of Rail Transportation and the ROCC.

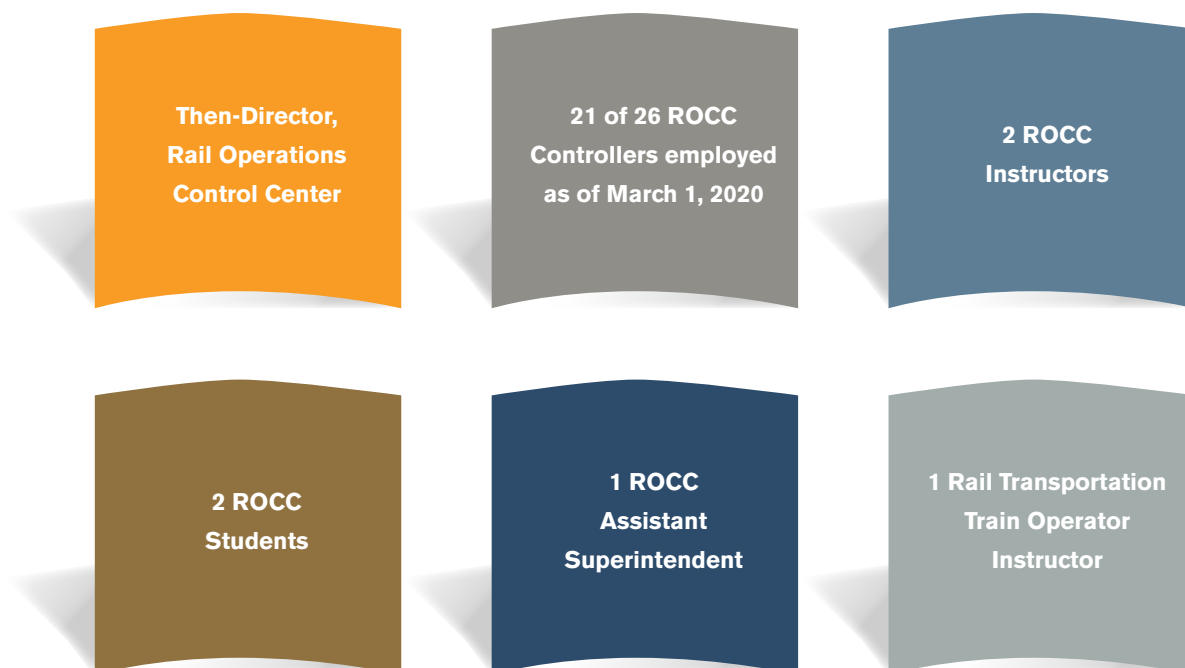


Audit Sources

The WMSC produced this audit of WMATA's Rail Operations Control Center based on direct observations, interviews of WMATA personnel, and reviews of WMATA policies, procedures, records and other documents. Audit work consisted of:

- Obtaining and reviewing documents including the most up-to-date plans, policies, and procedures governing the Rail Operations Control Center
- Interviewing employees including ROCC Instructors, management and 80 percent of Rail Traffic Controllers employed as of March 1, 2020
- Observing operations in the Rail Operations Control Center
- Reviewing radio and other communications involving the Rail Operations Control Center
- Providing an updated audit process and schedule specific to the ROCC
- Evaluating compliance with established plans and procedures, based upon the above sources of information
- Sharing a draft of this report with WMATA and considering comments received during the preparation of this final report

Personnel Interviewed





Documents Reviewed by the WMSC

- ▶ **Metrorail Safety Rules and Procedures Handbook (MSRPH) effective May 29, 2020, including issuance and update bulletin**
- ▶ **Rail Operations Control Center Procedures Manual (effective September 2015)**
- ▶ **ROCC training materials**
- ▶ **Maintenance Operations Control Standard Operating Procedures (SOPs), Operations Administrative Procedures (OAPs), checklists, and training materials**
- ▶ **ROCC controller and supervisor schedules from January 1, 2020 to July 4, 2020**
- ▶ **ROCC student reasons for departure from January 1, 2020 to June 23, 2020**
- ▶ **ROCC instructor, student, and staff lists as of June 23, 2020**
- ▶ **Access logs and permissions for digital recording system (NICE)**
- ▶ **Rail Operations Information Center (ROIC) Training Manual (February 2020)**
- ▶ **ROIC checklists, SOPs, and training materials**
- ▶ **ROCC Personnel Roadway Access form**
- ▶ **ROCC Compliance Check Log (October–November 2019)**
- ▶ **Temporary & Permanent Orders in effect from June 1, 2019 to June 23, 2020**
- ▶ **Electronic access and authorization logs**

This audit was conducted as part of the WMSC's safety audit program under FTA regulations in Title 49 CFR Part 674. The regulations require State Safety Oversight agencies audit each element of the rail transit agency's safety plans and referenced procedures at least once within a three-year period. The WMSC audits each element of WMATA's safety plan by conducting separate topic-area audits over the course of a three-year period.

Interviews with controllers were conducted off-site and included measures to ensure controllers could speak freely. The WMSC scheduled interviews on all shifts in order to minimize operational impact. Where quotations from interviews are used in this report, the information generally reflects statements from multiple interviewees or matches up with other WMSC observations and document reviews.

Any findings that are currently being addressed or required to be addressed by other CAPs that Metrorail is in the process of implementing were not repeated in the findings section of this audit, but are noted, as relevant, elsewhere in this report.

History

The day-to-day duties of ROCC employees expanded significantly in 2009 when Metrorail suspended Automatic Train Operation following the fatal Red Line collision near Fort Totten Station.

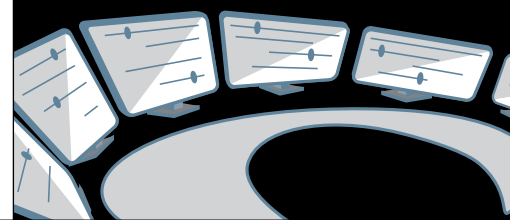
With all trains in manual operations after what the NTSB concluded was Metrorail's failure to effectively maintain and monitor the performance of its Automatic Train Control system, there are significantly more steps that must now be taken to accomplish the same movements and protections in the safest possible manner. Manual operations have continued to this day.

The NTSB's investigation into the fatal 2009 collision identified a culture that included a lack of ongoing concern about ways to avoid unforeseen problems, and WMATA management placing too much blame for accidents on individual frontline employees.

"[T]he WMATA Board of Directors did not seek adequate information about, nor did it demonstrate adequate oversight to address, the number of open corrective action plans from previous Tri-State Oversight Committee and Federal Transit Administration safety audits of WMATA," the NTSB wrote in 2010.

Following the January 2015 fatal electrical arcing and smoke accident near L'Enfant Plaza Station, a controller involved in the accident told National Transportation Safety Board investigators that there was limited training and that the situation inside the ROCC on the day of the incident was chaotic.

"The right hand did not know what the left hand was doing," the controller said.



Beginning in mid-2015, a uniformed fire department officer was stationed in the ROCC 24/7 in an effort to improve real-time communication between first responders and Metrorail.



In that event, Metrorail did not follow procedures requiring trains be stopped when there is a report of smoke, and the ROCC instead sent a train carrying passengers to investigate.

“There is a certain amount of calm that for me works better in chaos than a bunch of chaos trying to undo chaos,” the controller said.

As in the case of the fatal 2009 Fort Totten collision, the NTSB found WMATA's lack of a safety culture contributed to the fatal 2015 smoke accident near L'Enfant Plaza.

Similar problems with rail controller training or ROCC management and staff being allowed to substitute their own experience or judgement for proper procedures were identified in NTSB investigations into a fatal January 13, 1982 derailment near Smithsonian Station and a fatal January 6, 1996 train collision at Shady Grove Station. The NTSB concluded in its report on the 2015 L'Enfant Plaza accident that Metrorail had failed to ensure that positive short-term steps toward improvements in the immediate aftermath of accidents became permanent.

Following the 2015 accident and related NTSB findings, Metrorail and the region's fire chiefs, with the assistance of the Metropolitan Washington Council of Governments (COG), expanded the staffing of a fire liaison position in the ROCC. Beginning in mid-2015, a uniformed fire department officer was stationed in the ROCC 24/7 in an effort to improve real-time communication between first responders and Metrorail.

This fire department staffing was temporarily suspended in the first half of 2020 due to the public health emergency, with WMATA Office of Emergency Management (OEM) staff assigned to fill the fire liaison position.

Fire department staffing of the liaison position resumed July 19, 2020.

As part of the WMSC's regular oversight activities, the WMSC has been informed that regional governments are considering replacing those officers with fire department retirees who would be hired as contractors reporting to COG and/or the jurisdictions.

The WMSC appreciates the important long-term commitment of the region's fire chiefs and COG to keeping the fire liaison position staffed by experts in fire and EMS response and communications.

Other Prior Findings

A 2015 Safety Management Inspection (SMI) conducted by the FTA also found other significant concerns in the ROCC:



“[T]he FTA SMI found serious safety lapses in the Rail Operations Control Center (ROCC) related to the training and certification of rail traffic controllers; the ROCC structure, organization and staffing; the availability of checklists, procedures, manuals and tools; the quality of the radio system and radio communications; and the performance of the Advanced Information Management system to visually display and monitor the status of the rail transit system. Collectively, these issues significantly impact the ability of the Metrorail system to schedule and conduct maintenance work, to manage abnormal and emergency events, and to ensure the safety of trains and personnel,” the FTA said.

As far back as 1982, the NTSB recommended that Metrorail eliminate the practice of issuing verbal instructions in the ROCC that modify or amend operating rules and standard operating procedures.

With that background, the WMSC issued a new finding on December 20, 2019 following a December 10, 2019 event near Tenleytown Station that had many similarities to the fatal 2015 accident near L'Enfant Plaza Station nearly five years earlier:

“Dysfunction in the ROCC during unplanned events and emergencies that includes yelling, conflicting instructions, and the failure to use checklists detracts from the ROCC’s ability to manage the rail system appropriately and effectively.”

The WMSC concluded that “concerns raised by the NTSB and the FTA regarding the discipline within the ROCC and the ROCC’s handling of emergencies are still valid and must be addressed.”

Metrorail was required to propose a corrective action that would “eliminate the dangerous dysfunction within the ROCC by taking actions that include, but are not limited to, requiring and allowing controllers to follow written protocols and checklists, improving communication and workflow, and avoiding oversaturating controllers and distracting them with conflicting instructions.”

More than seven months after the WMSC’s December finding, and even after significant direction, Metrorail has yet to develop a fully acceptable corrective action plan.

The investigation into the December 10, 2019 smoke event demonstrates that Metrorail has not effectively sustained any progress that may have been achieved through prior CAPs. Serious problems remain that must be addressed.

Metrorail is also still developing acceptable CAPs in response to the WMSC’s May 12, 2020 findings.

The investigation into the December 10, 2019 smoke event demonstrates that Metrorail has not effectively sustained any progress that may have been achieved through prior CAPs. Serious problems remain that must be addressed.



Among the May 12 findings, controllers report they are routinely rushed by management to restore third rail power due to a focus on quickly restoring train service rather than careful adherence to safety procedures.

This has included multiple instances where controllers said they had been rushed to restore power even with first responders or others still on the tracks.

As the WMSC wrote May 12, 2020:

“The WMSC is concerned that ROCC managers and leadership are continuing to direct power restoration without regard for the safety implications of restoring power prematurely. For example, controllers described being instructed by management to restore power without confirmation that first responders were clear of the roadway. One controller described being rushed and told “to bring power up to get the trains moving.” The controller said, “We are always rushed to bring up power.” During the December 10, 2019, incident, power was restored at the direction of the ROCC Director while emergency personnel were still on the roadway. The Fire Department Liaison in the ROCC, seeing power re-energized at his workstation, contacted the emergency personnel who were still on the roadway to warn them. Since the Fire Department Liaison had not authorized power restoration, Metrorail procedures required power to remain off. Because it appears that managers and leadership are directing power restoration in disregard of the safety implications of restoring power prematurely, the WMSC is requiring Metrorail to develop additional protections before restoring power”

The WMSC is requiring that Metrorail use a second person, outside the RTRA chain of command, to actively verify that restoring power is safe. Having that second approval come from someone outside of the department concerned about on time performance is meant to ensure safety always comes first.

All appropriate training courses must be updated to include any new procedures.

In another action that puts customers, employees and contractors at risk, managers have regularly remotely manipulated controller consoles without coordination with controllers.

This interferes with controllers’ movement plans, the mental models of the intended flow of train traffic, and could lead to signals and switches being set in a way that sends trains toward people on the tracks.

As the WMSC wrote on May 12, 2020: “Uncoordinated remote operations could create conflicts or lead to trains entering areas they do not belong, which could lead to a collision, derailment, or other dangers.”

Almost all controllers interviewed said this happened to them routinely.

“The ROCC Director told the WMSC he views the remote manipulation, if it happens, as management taking control to reduce incidents, and suggested it is controllers’ responsibility to be alert for unexpected remote manipulation. “They can see what they did not do,” the Director said. He also said that he was not aware of remote manipulation occurring. However, in one of the cases specifically cited in controller interviews, a work zone indication was removed from a controller’s screen, despite crews remaining on the tracks.”

Following the WMSC findings May 12, Metrorail issued a directive that these actions should be stopped. The WMSC awaits an acceptable CAP to fully address this issue, including evidence that this practice has actually stopped.

Even after the WMSC findings, Metrorail’s own Department of Quality Assurance, Internal Compliance & Oversight (QICO) found nine instances of remote manipulation of consoles from May 15 through May 30, 2020. QICO did not identify any instances of remote manipulation in June 2020.

As the WMSC wrote on May 12, “Coaching controllers and providing training is a job ROCC management must do. Creating chaos and confusion by stepping in without coordination while yelling conflicting instructions is something they must not do.”

Ongoing CAP Revisions

The WMSC has provided significant direction for revisions to Metrorail’s original proposals for each CAP related to the December 2019 and May 2020 findings, because the original proposals would not have fully addressed the identified safety risks.

Metrorail’s General Manager and Board Chair communicated their commitment to fully addressing the May 12, 2020 findings as required in a letter to the WMSC on May 27, 2020, and Metrorail later provided draft Corrective Action Plans (CAPs).

In June 2020, following additional discussions with the WMSC tied to both the December 20 and May 12 findings, Metrorail reassigned the then-ROCC Director to a position outside of the control center. Metrorail has not yet selected a permanent replacement.

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Metrorail expects the number of positions required in the control center to rise again when a fourth controller console is activated as soon as late 2020.



The WMSC appreciates Metrorail's initial response to the May 12 findings regarding some of the safety issues with management, training and certain other aspects of the Rail Operations Control Center. The formal commitment to address these deep-seated issues is critical to the progress we are requiring of Metrorail. As the NTSB found, this commitment and focus must remain in place long-term to address crucial long-running problems like the managerial culture in the control center and a lack of understanding of how to use newer ventilation fans.

As part of that response, WMATA said it would now provide controllers with the specific information needed to understand how to operate ventilation fans, direct managers to follow rules and procedures, and hire outside consultants to provide some managerial training. Metrorail also said it planned to conduct additional compliance audits and provide additional updates to the WMATA Board.

Those steps appear poised to move the ROCC in a positive direction, but the WMSC will ensure that the formal CAPs that Metrorail officially commits to provide changes that truly address each finding and outline a path toward lasting change.

The WMSC is concerned that WMATA has provided limited material to controllers through instructors who are not fully informed about all aspects of the systems they are responsible for, including the ventilation fan systems. Controllers on the job today are not all on the same page, because they have received different types and levels of training.

Open CAPs

A number of other CAPs related to the ROCC remain open.

For example, Metrorail has yet to fully staff the ROCC, with the latest approved planned completion date now set for July 2021.

The WMSC is also requiring Metrorail to develop and execute a plan to actually achieve required ROCC staffing levels. This CAP replaced a prior, related CAP.

Metrorail expects the number of positions required in the control center to rise again when a fourth controller console is activated as soon as late 2020. The fourth console (OPS 4) is expected to cover much of the area served by the Silver Line in Virginia, including the Silver Line Phase 2 extension to Dulles Airport and Loudoun County which could be ready to open as early as spring 2021.

Metrorail had originally planned to open this console several years ago to alleviate the workload facing current controllers by shifting responsibilities for the Silver and Orange Line junction and the entrance to the West Falls Church Rail Yard to this new desk, but Metrorail has not yet had adequate staffing to do that.



General **Assessment**

General Assessment

The culture fostered by ROCC and RTRA leadership is toxic and antithetical to safety and other standards.

Lack of Safety Culture (Findings 1, 6, 9)

The culture fostered by ROCC and RTRA leadership is toxic and antithetical to safety and other standards.

Metrorail has promised to address many of these issues before, including after developing quality written plans, but many of those plans have not been effectively put into practice.

Although there have been some improvements in recent years, WMSC observations and interviews demonstrate that the highest levels of ROCC leadership have regularly directed controllers to ignore procedures and checklists. These procedures and checklists exist to ensure that no safety step is missed.

“All the time, you are getting different directions,” one controller said.

Managers do not allow controllers to use troubleshooting guides, and the WMSC has learned of multiple incidents where management, including the Vice President of Rail Transportation and the then-ROCC Director, violated or instructed controllers to violate safety procedures.

“Every incident you have, people are telling you different things while you’re trying to monitor the radio,” another controller said. “They will tell you one thing. Before you can do it, they are telling you to do something else.”

Other controllers and the WMSC’s independent observations confirm these descriptions.

Conflicting instructions can result in part from uncoordinated input into the handling of emergency events from people outside the immediate command and control structure inside the ROCC. This can sometimes include direction provided by managers who physically enter the ROCC but can also occur via phone calls such as communication through the Rail Service Disruption Line. The teleconference line is intended to provide important situational awareness for upper level managers, but ambient recordings of the ROCC show it has also been regularly used to provide real-time direction from afar or to require the superintendent to interrupt the assistant superintendent actively managing an incident. The interruptions with questions lead to the appearance that management is more concerned with updating people outside of the ROCC than actually managing an incident safely and effectively. The WMSC recognizes that senior Metrorail leaders outside the ROCC need to be informed and may direct operations when necessary, but the WMSC is concerned that a more effective balance is needed to promote a safe environment in the ROCC.





The responsibilities of each desk and each individual in the ROCC must be clear in all circumstances, with a clear command and control structure focused on safety as the top priority.

Metrorail must empower controllers to take the time needed for safety-critical steps like troubleshooting trains, allowing for track inspections, and following proper power restoration procedures.

As the WMSC noted May 12, 2020, “Claiming that controllers who have gone through an extensive training and certification process on safety rules and checklists that have been vetted for years are not capable of doing their jobs when they actually follow those procedures is extremely concerning.”

On December 20, 2019 and again on May 12, 2020, the WMSC noted that the failure to use checklists detracts from the ROCC’s ability to safely manage the rail system appropriately and effectively. Still, despite the safety risk, the then-ROCC Director said that management was still only considering allowing controllers to use checklists, rather than committing to past promises to follow written procedures.

“The ROCC Director reiterated management’s warning that if supervisors step back to allow controllers to do their jobs according to policy there could be additional risks. If that is truly the case, Metrorail must improve its own training, policies, checklists and procedures to fix that, rather than taking steps to block controllers from doing the jobs they are trained for,” the WMSC found May 12.

Following the WMSC’s May 12 findings, WMATA reassigned the then-ROCC Director in late June 2020 to another position at Metrorail and the General Manager and WMATA Board Chair committed to frequent check-ins and a broader review of ROCC operations.

Barriers to effective and lasting safety improvements in the ROCC remain though, including from long-time ROCC employees who have risen to upper levels of management.

After a draft of this audit was shared with Metrorail for final technical review as required by the WMSC Program Standard, the Vice President of Rail Transportation warned controllers of a higher workload and unnecessary paperwork, despite the WMSC’s draft findings focusing on management’s continued failures, not controller failures. The Vice President of Rail Transportation also told controllers not to talk to the WMSC, to resist required corrective actions, and to paint a rosy picture of the ROCC for an internal Metrorail transformation team. At least some of these discussions were held away from microphones that record ambient audio in the ROCC.

Metrorail must empower controllers to take the time needed for safety-critical steps like troubleshooting trains, allowing for track inspections, and following proper power restoration checklists.



Harassment, Threats (Findings 1, 9)

ROCC managers engage in racial, sexual and other forms of harassment, and use profanities and threats against controllers, which adds to the chaotic environment and creates additional layers of safety risks.

Multiple controllers expressed concerns about explicit sexual comments that they observed toward women, racist remarks, and homophobic remarks.

“You don’t listen because you are nappy headed. If you don’t train this student, I will have [Vice President of Rail Transportation] come down and walk your black a** out of here,” one controller reported hearing a manager say.

Other controllers observed similarly disturbing comments toward female controllers including, “I wonder if you taste as good as you look.”

Controllers also reported some instances of unwanted physical contact, and even the potential intoxication of a lower level manager. The WMSC provided the name of that manager, and certain other information developed during this audit, to the WMATA Office of Inspector General for further investigation during the audit process.

Controllers told the WMSC that this problematic environment makes it difficult to do their jobs and is one driver of significant turnover, further contributing to low morale and staffing challenges.

In September 2017, there were a total of 38 controllers and controller students. Only 12 of those 38 are still working as controllers today. From July 1, 2019 through June 30, 2020, 13 controllers or controller students left the ROCC, an approximately 27 percent attrition rate.

“People are leaving because there is not enough structure in the control center,” one controller said.

The WMSC finds that ROCC management has even baselessly threatened controllers with arrest or termination for following procedures or asking questions.

Controllers have a duty to raise concerns about safe operations and must not be punished for raising such concerns even if the issue is a directive from management.

“When management comes down to the console, they talk [to] you any old way. They yell. They curse,” another controller said.

Metrorail must identify issues like this on an ongoing basis through actions such as detailed exit interviews with departing trainees, controllers and assistant

superintendents, and by taking other steps to identify improvements that could retain qualified staff and promote a professional workplace climate.

Investigation Interference (Findings 2, 3)

Metrorail's internal investigations, when they consider the role of the ROCC, frequently rely on ROCC management descriptions of events or information downloads that pass through those responsible for managing the incident in question. Controllers also said in interviews that ROCC managers had attempted to shape statements they provided as part of investigations. This restricts a fully independent review.

WMATA could not provide any Standard Operating Procedures (SOPs), Operations Administrative Procedures (OAPs), or directives barring editing or deleting of raw data from a file such as an audio or video selection before the file is sent to investigators. A response to the WMSC said that all internal audio requests are retrieved by internal ROCC staff, including those who may have been involved in the event under investigation. Access logs to the audio recording system, NICE, also showed that from April 13 to June 13, safety officers generally did not independently retrieve audio for investigations, and instead relied on ROCC assistant superintendents in most cases. This creates a risk that the files that are eventually used as part of an internal or external investigation could be edited, redacted or manipulated in some way by those who were involved in the incident or by their colleagues, reducing or eliminating the value of any lessons that could be learned from the event.

Metrorail must not allow any individual employees, including those in the ROCC, to have a role in selecting or sending raw recordings (such as audio or video) that are part of an investigation into an event that they played a role in. The data must be retrieved by a separate department conducting an internal investigation.

When a safety event occurs, controllers (and any other ROCC employees involved) must be asked for and allowed to provide complete, accurate and unaltered statements. Metrorail must also fully consider the ROCC's possible role in each safety event. That investigative review must include drug and alcohol testing of each ROCC employee who could have played a role in the event as well as the review of raw, unaltered internal ROCC video, audio and other data recordings such as Advanced Information Management (AIM) system playback. Metrorail must fully capture all relevant information in those recordings, including all phone calls and ambient audio related to the fire liaison and ROCC assistant superintendent. Today, there are no ambient recordings of the fire liaison position, no recordings of fire liaison phone calls, and no recordings of a cordless phone line used by ROCC assistant superintendents.

**Metrorail must also
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Creating a positive safety culture in the ROCC will require significant change.

Deficient Reporting Culture (Finding 6)

A healthy safety reporting culture is characterized, in part, by an atmosphere in which employees are confident that when safety concerns are reported, they will be acted upon. If safety concerns are not acted upon, employees may conclude that raising a red flag serves no purpose.

Metrorail has allowed a culture to develop where frontline workers in the ROCC told the WMSC they no longer see any value in reporting and recording problems.

For example, in interviews with the WMSC, controllers identified sections of track near the Tenleytown, Dupont Circle, Farragut North, Union Station, Stadium-Armory, East Falls Church, McPherson Square, Eastern Market, Fort Totten, Takoma, Rosslyn, Potomac Ave, Naylor Road, Reagan National Airport, Cheverly, College Park stations, and the Yellow Line bridge over the Potomac River as areas where trains regularly lose speed commands.

In some cases, these areas have had the same problem for years with no fixes, leading controllers to believe there is no purpose to continuing to report the problems over and over again.

The apparent acceptance of lost speed commands can contribute to collisions, accidents or other issues when train operators begin to view moving without authorization as a normal activity. The risks are demonstrated by the October 7, 2019 collision near Farragut West Station that caused significant damage and injured two



train operators (see separate findings issued in 2019 and CAP C0017 for specific requirements to address loss of speed commands).

Metrorail's current System Safety Program Plan (SSPP) is intended to capture ways that WMATA can address this deficient reporting environment and improve its safety culture.

The upcoming replacement for the SSPP, the Public Transportation Agency Safety Plan (PTASP), is required to more explicitly emphasize how Metrorail will operate within a positive safety culture through the Safety Management System (SMS) approach long used in the aviation industry.

Creating a positive safety culture in the ROCC will require significant change.

"Morale is down in the ROCC as a whole. If you have a horse that loses a race, you don't shoot it. ... I will not make a decision, because if it is the 'wrong' one, I will be punished. It's kind of overwhelming at times," one controller said.

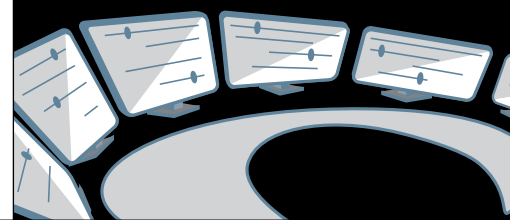
In a related example of tolerating disrepair, Metrorail has shuffled broken microphones around the ROCC rather than fixing them or purchasing replacements. In the WMSC investigation of a July 7, 2020 derailment near the Silver Spring Station, a critical controller microphone appears to have failed for several minutes. Ambient audio recordings from the ROCC show the controller was speaking, but recordings of radio traffic show that the audio was not transmitting from the ROCC.

Emergency Communications Failures (Findings 3, 4, 5, 21)

There is no consistent, clear, concise, immediate and reliable Metrorail communication process for safety-critical information between Metrorail personnel and the fire liaison.

In multiple instances, including the smoke accident near L'Enfant Plaza Station on January 12, 2015, a smoke event near Tenleytown Station December 10, 2019, a smoke event near Capitol Heights Station June 6, 2020, and a derailment outside Silver Spring Station July 7, 2020, the current communication process has failed.

In part due to the chaotic environment noted above, communication between the fire liaison position, ROCC employees and other levels of management has single points of failure, such as an assistant superintendent who may leave his or her position (near the fire liaison) to stand over a controller's shoulder during emergencies. This can lead to miscommunications in some cases and a lack of communication in other cases.



**Metrorail could do
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In each instance noted, the communications process has prevented information from being available to all who need it in a timely fashion and posed a risk that critical communication could be missed entirely.

In an interview tied to the July 7, 2020 Silver Spring derailment with an OEM liaison on duty at the time of the accident, that liaison indicated he received no specific training on how to fill the role, was unfamiliar with incident command, stated he did not use checklists in the role, and was unfamiliar with relevant standard operating procedures.

The fire liaison position was staffed by OEM personnel from March 2020 to July 2020 without Metrorail ensuring each individual was fully and specifically trained for the role.

Without proper training and significant fire rescue department experience for the fire liaison, that critical emergency response coordination will break down.

If OEM personnel or other Metrorail employees are going to be used in the fire liaison role in the future, they must be trained with an understanding of both the Metrorail system and emergency response communication, protocols and procedures.

During the response to the July 7, 2020 derailment, the fire liaison radio communication to first responders on scene did not function properly.

Regional groups coordinated by fire chiefs and COG are in the process of seeking funding for an improved networked radio system for the fire liaison that would provide coverage to the entire Metrorail service area. In the meantime, a short-term backup in the event of radio coverage issues has been a push-to-talk cell phone that connects directly to the public radio system.

In the case of the July 7, 2020 derailment, that cell phone was not available in the ROCC, suggesting that two of the phones are in fact needed, one for each ROCC facility, and checklists may be required for transfers between the two facilities.

Metrorail could do more to fully realize all benefits of the uniformed fire liaisons, including by creating an improved real-time communication and situational reporting process and by consulting the uniformed fire liaisons about rules changes and process improvements.

The agreement that instituted the full-time uniformed fire department officer staffing of the fire liaison position lists requirements for the position including considerable knowledge of fire and rescue emergency operations and response procedures, knowledge of specialized communications equipment and available emergency response capabilities, and the ability to establish and maintain effective coordination and collaboration between Metrorail jurisdictions, the ROCC and Metro Transit Police.

The ROCC also faces broader emergency communications challenges due to procedures that lack the required urgency to address life-safety issues.

Interviews and reviews of documents demonstrate that the liaison's responsibilities and role, regardless of who is filling the position, are not clear to all ROCC employees. This must be corrected.

Metrorail must establish redundancies and direct communication paths to ensure information is effectively communicated between the fire liaison, relevant controllers, other ROCC staff like the ROIC desk, first responders and others, particularly information regarding initial reports of emergencies and the location of personnel prior to power restoration.

This must include an information tracking method that makes accurate real-time information available to all employees in the ROCC and to upper management, so that employees managing the emergency can focus on their duties rather than being regularly called away to provide updates.

The ROCC also faces broader emergency communications challenges due to procedures that lack the required urgency to address life-safety issues.

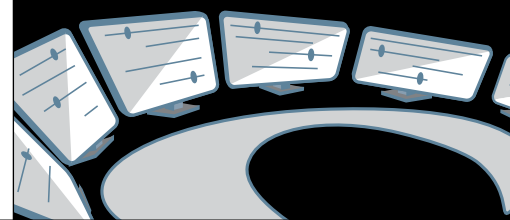
Fire and smoke procedures for the Rail Operations Information Center (ROIC) were last revised in April 2015, prior to the implementation of a full-time fire liaison and other important safety changes intended to improve emergency response.

Those procedures direct ROIC employees contacted by a station manager to begin with the assumption that a report of smoke or fire is a false alarm. The procedure also directs a back and forth with the Maintenance Operations Center (MOC) desk prior to calling 911 for a smoke or fire alarm or an alert from the chemical, biological, radiological and explosive alarm system. The procedures also direct the ROIC to send a station manager into harm's way to investigate for minutes prior to calling 911 for a report of a gas odor, fire or other issues. Metrorail procedures must err on the side of caution, and lead to an immediate fire department response to provide the highest likelihood of a safe outcome.

In 2016, the NTSB issued a recommendation that Metrorail review and revise ROCC emergency response procedures for smoke and fire. The NTSB currently classifies this recommendation as open with an unacceptable response.

Audio recordings reviewed as part of the WMSC investigation into a June 6, 2020 smoke event near Capitol Heights Station demonstrate that a station manager reported the smell of smoke, only to be questioned by the ROIC multiple times about whether it may not be smoke, but rather brake dust.

Despite the clear communication from the station manager that the smell was smoke, and that the smoke might be in the tunnel, it took four minutes for the ROIC to ask the station manager if a fire department response was needed. Some trains



Controllers work more shifts and longer shifts than permitted by WMATA policy.

continued to move in the area. The station manager evacuated customers from the station approximately nine minutes after the first report of smoke, and another train approached the station shortly after that decision.

Excessive Duties (Findings 10, 11)

Metrorail has not addressed the additional workload on controllers that resulted from ending the use of Automatic Train Operation in 2009 following the fatal Red Line crash near Fort Totten.

The current Rail Operations Control Center Procedures Manual has not been updated since September 21, 2015 and is past due for review. It includes outdated standard operating procedures, despite its intent to serve as the document that governs how the control center is run.

None of the additional tasks and responsibilities required during the last 11 years of manual operations appear to have been fully considered as part of ROCC rules and procedures, which are still based on the assumption that trains are usually operating in automatic mode.

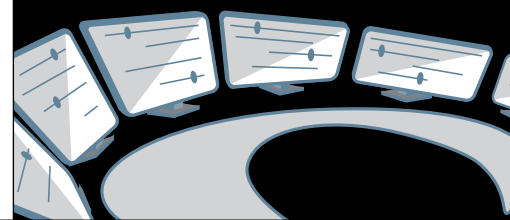
Beyond those procedural issues, controllers are distracted during emergencies by nonessential communications that could be handled by other desks such as the ROIC. As an example, a controller cited calls from station managers that relate to customer service, such as lost and found items or fare disputes, during emergency response.

Metrorail must assess current responsibilities of ROCC controllers to determine if each responsibility is practical, what responsibilities must be shifted to other or additional positions, and whether administrative staff who were briefly added to the control center to assist with important documentation requirements such as Daily Activity Logs should return.

That assessment, including a cognitive task analysis, must be used to update rules and procedures and to inform minimum qualifications for the position. Metrorail has a number of electronic systems that are relatively advanced, but Metrorail does not always take full advantage of all features to attain the maximum possible benefits or fully maintain and update equipment like microphones. This assessment should also identify areas where systems such as the Advanced Information Management (AIM) system can be more fully utilized to provide additional layers of protection such as handling routes, enforcing and releasing foul time protection for employees or contractors on the right of way, or providing more automated management of fans.

Based on the assessment, associated training must be updated to reflect current realities.





Rail Controller Fatigue (Finding 7)

Controllers have significant safety responsibilities and, like all other people, are at a higher risk of making errors if they are fatigued. Yet, the WMSC finds controllers work more shifts and longer shifts than permitted by WMATA policy.

Interviews, schedules and related documents demonstrate that Metrorail has not always followed its fatigue management policy that requires at least one day off per week.

Metrorail fatigue policies for the ROCC state that controllers may not work more than six consecutive calendar days without 24 hours off, but also state that if a controller works seven consecutive days that the controller must get 48 hours off.

A review of schedules from January 1, 2020 to July 4, 2020 showed multiple controllers working more than 10 or 20 consecutive days, including stints of 26, 28 and 29 consecutive days for individual controllers in April, May and June 2020.

One controller worked eight separate stretches of seven or more consecutive days in the January 1, 2020 to July 4, 2020 period, including stretches of 20 days and 28 days straight.

Even prior to additional staffing challenges due to the current health emergency, that controller worked one stretch of 13 consecutive days (including two short turnarounds) and worked seven consecutive days twice.

Metrorail has also not always followed other aspects of Fatigue Policy section 5.02 governing the ROCC that caps controller shifts at 12 hours and that requires 12 hours off before returning to work. Several controllers reported working shifts that exceeded these limits.

Management does not permit controllers to take breaks, which can create additional fatigue risks and contribute to retention issues in the ROCC.

Fatigue from rotating schedules, a lack of sufficient sleep, or from working long stretches without a day off creates impairment and increases the risk of an accident.

Assignments must also factor in responsibilities outside of work (e.g., commuting time, personal activities) that would preclude the opportunity for sufficient sleep on short shift turnarounds or unusual schedules.

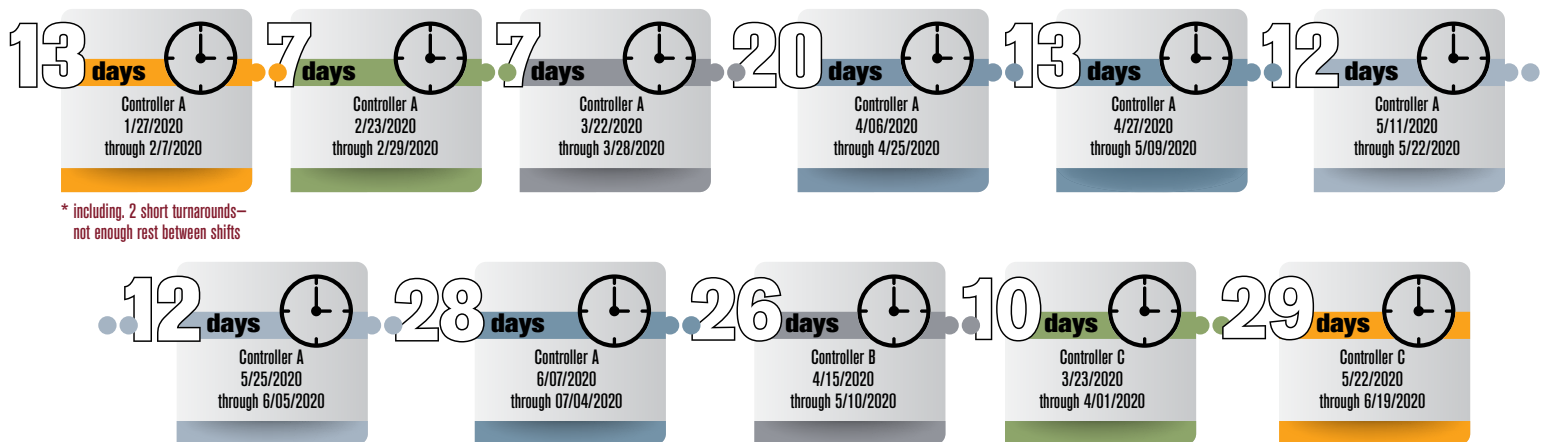
The culture in the ROCC, high turnover, and a broken recruitment approach have led to a situation where, without a course correction, WMATA will continue to struggle to meet the minimum staffing levels in the ROCC required for the safe operation of the rail system.

Fatigue is a safety concern that must be addressed both through proper staffing, as noted elsewhere, and proper scheduling.

ROCC Controller Schedule Fatigue Policy Violations

JANUARY 1, 2020 THROUGH JULY 4, 2020

Consecutive days worked without a day off



Staffing Shortfall (Findings 8, 9)

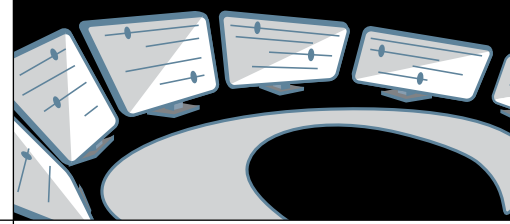
The culture in the ROCC, high turnover, and a broken recruitment approach have led to a situation where, without a course correction, WMATA will continue to struggle to meet the minimum staffing levels in the ROCC required for the safe operation of the rail system.

The WMSC and FTA have previously issued findings that led to a currently open CAP requiring an innovative plan to achieve required staffing in the ROCC (C0007). This CAP superseded a similar CAP tied to FTA findings (FTA-Rail-1-1-A).

This audit identified additional issues that, without corrective action, are likely to continue to prevent Metrorail from meeting critical staffing requirements.

A high rate of turnover contributes directly to the staffing challenge and the lack of positive institutional knowledge and experience available to handle complex and stressful situations. As of July 31, 2020, 18 certified controllers who were working in September 2017 had left their positions due to promotions or moves to other jobs within WMATA (9), discipline (4), retirement (3), or moves to jobs outside of WMATA (2).

Metrorail does not currently meet its required staffing levels and is not on track to do so. Further, WMATA will require additional positions as Silver Line Phase 2 opens to Dulles International Airport and Ashburn and a planned fourth console (OPS 4) is



launched in the ROCC to cover most of the stations and mainline tracks serving the Silver Line and Orange Line in Virginia.

Metrorail has said it would take more than 50 certified controllers to run all four control desks.

In July 2020, Metrorail told the WMSC there were 30 certified controllers, a number that is essentially unchanged from the 29 identified in the FTA's SMI five years earlier.

As the WMSC has previously communicated to WMATA, if ROCC staffing continues to fall short, WMATA and/or the WMSC may be forced to conclude that it would be unsafe to fully test and open the Silver Line extension to Loudoun County.

Achieving required staffing levels is crucial to the safety of everyone in the Metrorail system.

Continued short staffing adds to high turnover rates and concerns about the culture in the ROCC by creating scheduling challenges that can also make it difficult to grant vacation requests.

Today, there are 19 ROCC students in various phases of training. However, a number of trainees have left recent training classes before working a single shift or have departed soon after certifying, and existing controllers continue to leave the ROCC on a regular basis.

In six controller classes completed from September 2017 to July 2020, 10 of 41 students never certified. Three other students left shortly after being certified, three more left for jobs outside of WMATA, and three more have moved to jobs elsewhere inside WMATA. In total, 19 of 41 controller students from classes completed within the last three years are not working as controllers today.

One challenge to retaining controllers who have experience outside of WMATA in fields like air traffic control is that ROCC managers do not normally allow for breaks during a shift, even raising questions when controllers go to the restroom. In many other control center environments, including air traffic control facilities, controllers typically work for several hours then get a break to go to the restroom, eat lunch and refocus.

Metrorail's recruitment and hiring process must be overhauled in order to address long-term staffing requirements.

Prospective controllers are not clearly provided with the specifics of the job or conditions of the job offer during the application process. Metrorail also does not use standardized rating metrics at all points in the hiring process to identify whether an accepted applicant is likely to be a good fit for the high-stress controller environment. Accepted applicants must be allowed to experience the ROCC environment directly

In July 2020, Metrorail told the WMSC there were 30 certified controllers, a number that is essentially unchanged from the 29 identified in the FTA's SMI five years earlier.



beginning early in the training process in order to have a complete understanding of the job they are expected to do.

Metrorail must provide upfront transparency about the taxing nature of the job, the bonus agreement (if Metrorail continues it) WMATA requires trainees to sign with a minimum three-year commitment to the ROCC, and other conditions of employment.

In the first half of 2020, one ROCC trainee was removed for failing a test, and one was removed due to concerns of poor attendance. Three other ROCC trainees opted to leave after months of training due to the bonus commitment requirement, getting another job offer, or due to family issues.

Wasting limited slots in a training course that is scheduled to last nine months is counterproductive and is another indication that a complete reassessment of the approach to meeting staffing standards is required.

This overhaul must consider the pool of ideal recruits, hiring standards and practices, the best way to structure bonuses and other incentives, Metrorail's initial and ongoing training programs, and other pertinent factors.

Recruits must be identified and hired based on their abilities, not based on a single individual's arbitrary rating that is not rooted in human resource rules, validated standards and specific qualifications required.

Training Deficiencies (Findings 15, 16, 18, 19)

Metrorail is not consistently training controllers in a standardized fashion and does not equip controllers with all of the training required to do their jobs.

Multiple controllers reported that significant time is wasted during initial training through frequent long breaks at times class is supposed to be in session, and through days that are not productive.

"We don't do much in the training in the first half of the day, and didn't do much after lunch," one controller said.

Once on the job, management then directs controllers to ignore training on procedures and checklists, instead directing controllers to use alternative methods to address issues like brake problems.

For years, as was also identified in NTSB investigations in 1982 and 1996 and in the

2015 FTA SMI, ROCC managers have substituted their own untested and unofficial versions of procedures for the written procedures that are meant to be in effect. Metrorail has not substantively resolved this issue.

"Training is a joke. It doesn't prepare you for the job. You are starting over after training when you hit the floor," a controller said.

Some controller training courses have also been unilaterally shortened by management, and larger classes have posed challenges to completing all specific exercises for each trainee.

Metrorail must implement consistent, specific daily lesson plans and schedules for training courses that are structured to provide the required training in the most efficient amount of time.

The certification process for ROCC instructors, assistant superintendents, superintendents and controllers is also inconsistent, not properly documented, and lacks proper controls to ensure the integrity and meaning of certification.

ROCC instructors and ROCC managers are certifying their own colleagues.

In other cases, assistant superintendents are sometimes certifying or recertifying controllers who those managers need on duty given current staffing shortfalls. Direct supervisors, such as assistant superintendents, should not have certification responsibilities, since that can create conflicting incentives to certify even controllers who are not meeting all requirements.

Unlike other areas of rail operations where Metrorail has made changes due to similar concerns, the RTRA Quality Assurance/Quality Control (QA/QC) group is only sometimes involved in the ROCC certification process.

RTRA QA/QC already has certification responsibilities for train operators, supervisors, and interlocking operators. (Interlocking operators have similar responsibilities to rail controllers but oversee movement in rail yards.)

The ROCC certification process must be standardized and codified for each position.

The process must not involve Metrorail managers who would face challenges due to staffing and scheduling issues if the employees they are certifying were denied certification due to valid safety concerns. Each certification process must include objective and impartial evaluation of each individual's capabilities by a department such as RTRA QA/QC.

Current certification and recertification scenarios required of ROCC employees are

Current certification and recertification scenarios required of ROCC employees are repeated year after year.



repeated year after year, diminishing the value of the testing and training process. The limited number of specific scenarios, which are now known to those being tested in advance, opens the door to preparation focused only on those locations or circumstances, rather than requiring a broader review. The pool of scenarios must be expanded and randomized for each test.

Even in those scenarios that are conducted in the certification process, testing is not always stringent. For example, in a fire and smoke simulation, controllers can theoretically meet requirements even if it takes 29 minutes to activate ventilation fans.

The updated certification process must include clear parameters for each step in each scenario to determine whether the person passes or fails.

Controllers and managers interviewed agreed that the current certification process is, as one said, “a farce.”

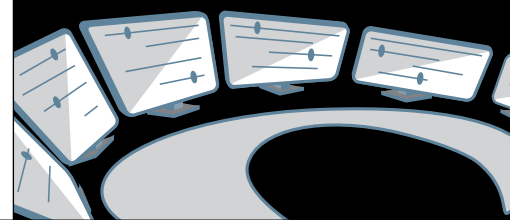
Recertification training, when provided, does not always include key safety details and reviews such as how to operate emergency ventilation fans.

On May 12, 2020 the WMSC found:

“Nearly all controllers interviewed said that their training on the use of emergency ventilation fans was inadequate and only a few were familiar with the Emergency Ventilation Playbook on emergency fan operations that Metrorail developed after the L'Enfant Plaza accident in response to an NTSB recommendation.

“I am not confident that my coworkers know how to properly use the fans





in an emergency,” one controller said. Several others expressed concerns that they were unsure how to use new jet vent fans on the Silver Line in Virginia or the tracks shared by the Blue and Silver Lines between Stadium-Armory and Largo Town Center stations. “It’s just a matter of time until something happens,” one controller said.

While the ROCC Director told the WMSC that the ventilation system operations playbook is available in hard copy at controllers’ desks, all controllers interviewed said the document was not available. Many controllers had not seen the document.

Controllers also said there was no significant fan training in their regular recertification classes.

As part of a Corrective Action Plan to address NTSB findings related to the 2015 accident, Metrorail found the proper operation of the fans is required to meet fire safety standards.

This lack of readiness to respond to smoke and fire events could lead to a repeat of the January 12, 2015, L’Enfant Plaza Station electrical arcing and smoke accident, or worse.”

In response to our May 12, 2020 findings, WMATA told the WMSC that a quick reference guide for emergency ventilation fans and the 703-page fan playbooks are now being made available at each desk. WMATA also developed a fan training course curriculum that includes specific explanations of the two newer types of fans on part of the Silver Line in Virginia and part of the shared Blue and Silver Line tracks in Maryland.

Although improved understanding of the use of those fans is crucial, Metrorail was warned of this problem systemwide after the fatal 2015 arcing and smoke accident, and told the NTSB it had completed changes to address this issue. However, the May WMSC finding was similar to the NTSB’s finding.

“Investigators learned that control operators in the ROCC were not trained on strategies for configuring station and tunnel ventilation fans, and therefore, on the day of the accident, the under-platform fans in the L’Enfant Plaza Station were turned on in exhaust mode, blanketing train 302 in smoke and pulling smoke into the station,” the NTSB wrote.

The WMSC has reviewed Metrorail’s proposed corrective action responding to the new May 12 finding to ensure training and any additional drills are appropriate and include a commitment that the training and drills will be sustained for years to come. Metrorail must ensure that each controller knows how to properly use emergency ventilation fans.

Minimum training standards and protocols are needed for each job to ensure that all employees have the opportunity to learn relevant rules in a standardized fashion.

Controllers are not being allowed to actually gain the intended knowledge because they are kept isolated from the actual work they need to observe or territory that they must be familiar with.



Metrorail must ensure that all aspects of initial and refresher training are similarly kept current and relevant to provide ROCC employees with the tools necessary to effectively perform their duties.

Metrorail should consider more fully taking advantage of the technological capabilities of the AIM system for fan operations and must ensure that the fan expertise of the Plant Maintenance desk is fully utilized.

On the job training for controllers is also not structured or standardized. Certified controllers are simply assigned a trainee without guidance on what information or skills must be conveyed or how to do that.

“The only thing they tell you is ‘make sure you do it right, because they are going to be your future partner,’” one controller said.

Standards must be established to be sure new or returning controllers are adequately prepared for their roles on all shifts, including the overnight shift when there is extensive track access.

On the job instructors must be sufficiently trained and experienced to provide training and coaching on tasks and procedures. When instructors identify a need for additional training or re-training before their students should be allowed on the desk independently, Metrorail must have specific steps to provide additional instruction or experience.

Current and recent trainees also said they face conflict as they enter the ROCC, with a sense that the people training them on the floor are rooting for them to fail. This makes each class of controllers entering on the job training closer to each other, but separates each group from others, preventing the establishment of a cohesive team.

Other Outdated Procedures (Findings 5, 11, 12, 20)

In addition to the ROCC Procedures Manual and ROIC fire and smoke procedures, Metrorail has not regularly updated a number of other crucial standard operating procedures (SOPs) or operations administrative procedures (OAPs) that govern desks like the Maintenance Operations Center (MOC) and the Rail Operations Information Center (ROIC).

Metrorail could not provide any training documentation or a procedures manual for MOC staff, and Metrorail provided only a study guide for ROIC staff. Minimum training

standards and protocols are needed for each job to ensure that all employees have the opportunity to learn relevant rules in a standardized fashion.

The ROIC radio SOP was last updated in February 2015, the MOC SOP governing work order closeout and completion was due for review in December 2017, and the MOC OAP for Maintenance Operations was last reviewed in December 2016 with no updates from the September 2013 version.

Failure to review SOPs and OAPs that form the basis for critical operations runs the risk of missing safety hazards or creating conflicts among SOPs or other procedures that have been updated, such as the Roadway Worker Protection program.

As required under the Safety Management System approach, the SOPs and OAPs must be reviewed on a regular schedule. To ensure that the documents are practical and improve safety by appropriately addressing known hazards while considering other hazards that could be inadvertently introduced, these reviews require full consultation with groups including the Metro Transit Police Department (MTPD), the Office of Emergency Management (OEM), engineering departments, Metrorail's Rules Committee and front-line workers.

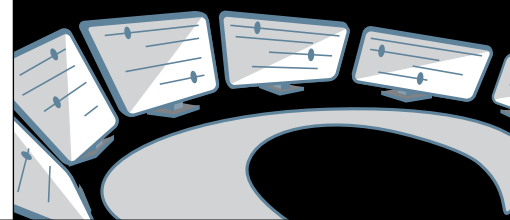
To make sure that these procedures are actually implemented on a consistent basis, each update must be clearly communicated to the staff responsible.

To keep all those working in the ROCC on the same page, controllers and their supervisors could benefit from a review of the information and updated procedures provided to MOC and ROIC employees.

Ride Alongs (Findings 13, 14, 17)

Each controller is required to participate in ride alongs meant to familiarize them with the rail system and to keep up with changing elements (instituted as part of CAP FTA-Rail-1-3-A requiring road days), however those days are not being effectively utilized.

In 2015, the FTA's Safety Management Inspection found controllers lacked practical experience and territory familiarization. In response, Metrorail created this specific ride along program, but, in practice, controllers are not being allowed to actually gain the intended knowledge because they are kept isolated from the actual work they need to observe or territory that they must be familiar with largely because they have not been provided with the personal protective equipment (PPE) required to access the roadway. Controllers are frequently left sitting in locations like maintenance vehicles for hours while the actual work is being done on the tracks.



The time controllers spend with work crews is being treated as a requirement to check a box, rather than as an opportunity to provide important real-world experience to controllers that could improve their effectiveness and boost the productivity and safety of all roadway workers.

"The three days were just a vacation from work," one controller said.

The controller was left to stand with an Advance Mobile Flagger (AMF) for one shift rather than being allowed on the roadway with track walkers. On another day, the controller was required to stay on a maintenance vehicle for several hours.

Metrorail must ensure that each controller has the PPE required to take advantage of the ride alongs. PPE must be identified as part of the required tools and equipment for ROCC training.

Ride alongs must include actual experience throughout the system to provide territory familiarization and an understanding of how work crews function on the roadway.

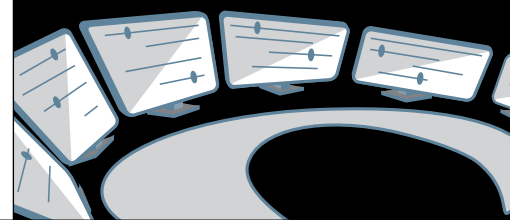
Sending controllers to the same spot year after year, as controllers indicated in interviews, for this limited observation while at the same time failing to help controllers understand what all parts of the system look like through varied ride-alongs with operators prevents controllers from building the knowledge necessary to do their jobs.

Another way to build that understanding would be to return all controllers to the highest level of Roadway Worker Protection (RWP) qualification. A lack of Level IV RWP training prevents controllers from having the full knowledge and understanding of roadway operations and procedures required to do their jobs.

WMATA briefly required all controllers to meet this requirement several years ago, before reducing the controller qualification standard to RWP Level II.

Controllers must have the same understanding of RWP rules, track access and other protection policies that Roadway Workers In Charge have. They are authorizing people to do a job; they should understand what they are authorizing them to do.

Interviews with controllers also demonstrated that they and assistant superintendents are not provided with sufficient, substantive joint practice or emergency drills related to emergency situations. This can make real emergencies more stressful and contribute to the chaotic environment in the ROCC.



For example, Metrorail told the WMSC that only controllers who happen to be working on the line where a formerly quarterly emergency drill is conducted at the time of the drill on a Sunday morning have the opportunity to experience the exercise. Therefore, not all controllers experience emergency drills. This diminishes the value of those drills from the ROCC perspective, despite the ROCC playing a crucial role in any real emergency response.

Because these exercises are scheduled far in advance, ROCC controllers, assistant superintendents and other staff could be scheduled for the drills on a rotating basis.

Each controller must be involved in emergency drills on a regular basis, and Metrorail must document that training for each controller.





Findings and Required Corrective Actions

Findings and Required Corrective Actions

The Washington Metrorail Safety Commission finds that significant improvements are required in the Rail Operations Control Center given the unacceptable safety risks posed if the ROCC continues down its current path.

As the WMSC wrote on May 12, 2020, “Rail Operations Control Center management has clearly disregarded many lessons of the past and has failed to improve Metrorail’s preparedness. The risks of injuries and deaths are unacceptable, and Metrorail must take immediate action.”

WMATA must take and maintain corrective actions to ensure the safety of riders, employees, contractors, first responders and all others who depend on the Metrorail system.

Findings in this report refer to instances of WMATA operating out of compliance with an applicable written requirement, plan, policy, rule, standard, or procedure. A finding may also refer to an instance where WMATA does not have a relevant written plan, policy, or procedure in place, or an instance where the existing practice may present a potential hazard. Each finding has an associated corrective action that WMATA must address as part of its proposed Corrective Action Plan(s).

The new findings that follow are in addition to these prior recent WMSC findings:

- **December 20, 2019 (prior to start of this audit work):** Dysfunction in the ROCC during unplanned events and emergencies that includes yelling, conflicting instructions, and the failure to use checklists detracts from the ROCC's ability to manage the rail system appropriately and effectively.
- **May 12, 2020:** ROCC controllers are not prepared to operate the ventilation fans to respond to smoke and fire events, which could lead to a repeat of the January 12, 2015, L'Enfant Plaza Station electrical arcing and smoke accident, or worse. Metrorail must propose a corrective action that addresses the following: Rail controllers must be provided proper, complete and recurring training on the use of emergency ventilation fans, and rail controllers must be provided immediate access to and familiarization with the vent fan playbook that was called for by the NTSB after the January 2015 L'Enfant Plaza Station arcing and smoke accident.
- **May 12, 2020:** ROCC management routinely remotely manipulates controllers' consoles without expressly sharing or coordinating train movement plans with the controllers, which is an unsafe practice that could lead to a collision, derailment or jeopardize the safety of front-line





Finding 1:

Finding 2:

personnel under the direction of controllers. Metrorail must propose a corrective action that addresses the following: Prohibit ROCC managers and leadership from remotely manipulating consoles in the ROCC without coordinating with the controllers and verify by periodic audit and/or computer-generated reports that uncoordinated remote manipulation has ceased.

- **May 12, 2020:** Third rail power restoration is routinely rushed by ROCC management with a focus on restoring train service rather than a focus on following safety procedures. Metrorail must propose a corrective action that addresses the following: Institute additional protections to ensure that third rail power is not restored prematurely, including, but not limited to, ensuring that managers and leadership permit all power restoration checklists and procedures are followed to be certain power is only restored when it is safe to do so. These additional protections must include providing an independent approval from an appropriately qualified employee outside of the Office of Rail Transportation, so that safe power restoration is always placed ahead of service metrics such as on time performance.

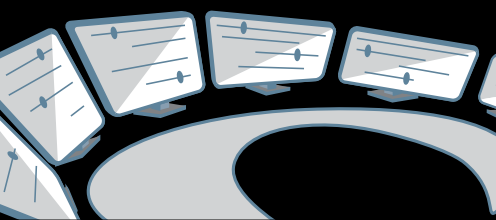
New findings in this audit report:

ROCC management contributes to a chaotic environment. Use of profanities, threats and racial, sexual or other forms of harassment are regular features of the control center's environment, which makes it difficult for controllers to do their jobs and drives low morale and significant turnover.

Corrective Action: Metrorail must professionalize operations in the Control Center as part of a plan to improve rule compliance and reach full staffing levels. The comprehensive fixes included in previously required Corrective Action Plans must include a correction of the deep-seated toxic workplace culture in the control center.

ROCC management attempts to manipulate safety event investigations and baselessly threatens controllers with arrest or termination.

ROCC managers have attempted to shape statements given by employees during safety investigations, have baselessly threatened controllers who have questioned directions to violate rules and procedures, and Metrorail has at times initially provided only portions of relevant recordings during safety event investigations. WMATA could not provide any SOP, OAP or directive barring editing or deletion of raw data such



Finding 3:

as audio or video before it is used in an investigation or otherwise accessed for any valid purpose. A response to the WMSC said that all internal audio requests are retrieved by internal ROCC staff rather than SAFE or HR. This was confirmed by access logs to the NICE system, which showed safety officers largely rely on assistant superintendents to retrieve audio recordings, creating a risk that the files eventually used as part of an internal or external investigation could be edited, redacted or otherwise manipulated by individuals involved in an event or their colleagues. Metrorail must not allow any ROCC employees the opportunity to delete or edit raw data such as audio files that are being provided for use in investigations, and must only, if required, provide read-only access to all sources of data used in safety event investigations.

Corrective Action: Metrorail must obtain and provide complete, accurate and unaltered data, statements, and other relevant information as part of each safety investigation to include interviews with ROCC employees, drug and alcohol testing of each ROCC employee connected to the event, and direct, independent reviews and downloads of ROCC audio and data recordings such as AIM system playback as part of a process to fully consider the ROCC's possible role in each safety event.

Metrorail does not record all critical ROCC communications, limiting the lessons that can be learned from safety events.

Metrorail does not record a cordless phone used by assistant superintendents, does not record ambient audio in the area of the fire liaison, and does not record phone calls made by the fire liaison.

Corrective Action: Metrorail must fully record and adequately retain all communications that are tied to operations and emergency response.

Finding 4:

There is no consistent, clear, concise, immediate and reliable Metrorail communication process for safety-critical information between Metrorail personnel and the fire liaison.

In multiple instances, including January 12, 2015, December 10, 2019, and June 6, 2020, the current process has failed.

Corrective action: Metrorail must make the fire liaison's role and responsibilities clear to all ROCC employees. Metrorail must establish redundancies and direct communication paths to ensure information from the fire liaison is properly communicated to the relevant controllers, first responders and others, particularly information regarding initial reports of emergencies and the location of personnel prior to power restoration. This must include an information tracking method that

Finding 5:

makes accurate real-time information available to all employees in the ROCC and to upper management, so that employees managing the emergency can focus on their duties rather than being regularly called away to provide updates.

Some Metrorail procedures lack the required urgency to address life-safety issues.

Fire and smoke procedures for the ROIC, last revised in April 2015 prior to the implementation of a full-time fire liaison and other important safety changes, direct ROIC employees to begin with the assumption that a report of smoke or fire is a false alarm. The procedure directs a back and forth with the MOC desk prior to calling 911 for a smoke or fire alert or an alert from the chemical, biological, radiological and explosive alarm system. The procedures also direct the ROIC to send a station manager into harm's way to investigate for minutes prior to calling 911 for a report of a gas odor, fire or other issues. Metrorail procedures must err on the side of caution, and lead to an immediate fire department response to provide the highest likelihood of a safe outcome.

Corrective action: Metrorail must rewrite smoke, fire and related alarm policies including specific responsibilities for calling and dispatching the fire department and immediate communication with the fire liaison. The new policies must be developed in consultation with WMATA's Fire Marshal, SAFE, MTPD, the COG Fire Chiefs' Passenger Rail Safety Subcommittee and other relevant experts. All employees involved must be trained on these procedures, and the procedures must be included in refresher and new class training.

Finding 6:

Repeated failures to address safety issues have contributed to a culture where frontline workers no longer see any value in reporting and recording problems.

Controllers see some safety problems as so prevalent that they do not see any value in reporting the issues over and over again. For example, there are areas where speed commands continue to drop out due to Metrorail management's repeated failures to ensure that issues are addressed. Also, defective critical communications microphones in the ROCC are shuffled around the room. Neglecting to address these issues can contribute to collisions, accidents or other issues, as demonstrated by the October 7, 2019 crash near the Farragut West Station.

Corrective Action: Metrorail must ensure that any and all deficiencies are promptly and properly reported, tracked and repaired as required by WMATA policies to reduce the risk that safety issues slip through the cracks.



Finding 7:

WMATA does not always follow or clearly define its fatigue risk management procedures for the Rail Operations Control Center, including those limiting the length of controller shifts.

Fatigue is a significant concern that must be addressed both through proper staffing, as noted elsewhere, and proper scheduling. Metrorail's fatigue risk management policies cap controller shifts at 12 hours, and require at least one day off per week, but several controllers reported exceeding those limits. In multiple cases, including in January, February and March 2020, controllers worked 7 or more consecutive days. Controllers also worked stints of 26, 28 and 29 consecutive days in April, May and June 2020.

Corrective Action: Metrorail must ensure that hours of service, required rest periods, and related policies are followed and that those requirements are clearly communicated to all staff and management.

Finding 8:

Metrorail's ROCC recruitment and retention approach is failing. Some controller trainees have left the ROCC immediately after or shortly after the training course, which is scheduled to last nine months.

Others did not understand some key roles, responsibilities and conditions of the job offer until after the training process was complete. If available seats in training are not fully and effectively utilized, WMATA will not be able to reach required staffing levels.

Corrective Action: Metrorail must provide complete transparency during recruitment on the taxing requirements of the job of a controller, use those requirements to target recruitment efforts, and use a team evaluation approach for each candidate with standardized rating metrics during the application and interview process to ensure an accepted applicant will likely be a good fit for the controller environment (stress, shifts, etc.). Metrorail must provide upfront transparency about required time commitments, required bonus agreements and any other conditions of employment. Accepted applicants must also be allowed to experience the ROCC environment directly beginning early in the training process in order to have a complete understanding of the job they are expected to do.



Finding 9:

A high rate of staff turnover in the Rail Operations Control Center contributes to staffing challenges and a lack of positive institutional knowledge that can contribute to safety challenges.

Corrective Action: Metrorail must take actions such as conducting detailed exit interviews with departing trainees, controllers and assistant superintendents to identify ways to retain qualified and quality staff. These actions must be documented, and the records must be maintained for future review. Management must review these interviews and other actions to identify potential improvements.

Finding 10:

Controllers still have too many responsibilities and are frequently rushed to complete tasks by management.

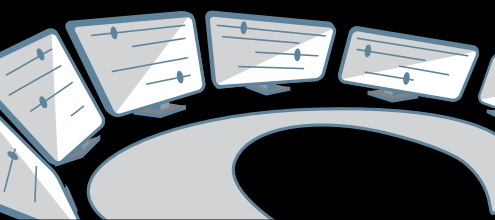
Corrective Action: Metrorail must conduct an assessment of all current responsibilities for ROCC controllers, assess if each responsibility is practical, determine what responsibilities must be shifted to other or additional positions, and determine whether to resume the use of administrative staff to assist with documentation requirements such as Daily Activity Logs. This assessment must include the use of a new cognitive task analysis to inform training, minimum qualifications and distribution of responsibilities. The assessment and cognitive task analysis must be provided to the WMSC.

Finding 11:

WMATA has failed to regularly update the Rail Operations Control Center Procedures Manual.

The manual has not been updated since September 21, 2015, and it does not reflect the current realities, including the latest standard operating procedures and the past decade of manual operations. A number of controllers said they were not familiar with the manual, which is intended to be the document that governs how the control center runs.

Corrective Action: Following the assessment required by Finding 10, Metrorail must update ROCC procedures and related documents to reflect current realities. This update must include improvements identified through cognitive task analysis and other parts of the required assessment of current responsibilities for ROCC controllers. The update must also include any changes based on cognitive task analyses of the responsibilities of other control center staff and management. Controllers and other ROCC staff must be fully familiarized with and trained on the policies in the updated manual in initial, refresher and updated training.



Finding 12:

WMATA has not reviewed SOPs or OAPs on a regular basis.

MOC SOP 100-19 governing work order closeout and completion was due for review in December 2017, a Rail incident management OAP was due for review in September 2019, the MOC OAP for Maintenance Operations was last reviewed in December 2016 and last updated in September 2013, the ROIC radio SOP was last updated in February 2015. Failure to review SOPs and OAPs that form the basis for critical operations runs the risk of missing safety hazards or creating conflicts between procedures.

Corrective Action: WMATA must identify all in-effect ROCC-related SOPs and OAPs, establish an ongoing schedule of when each is due for review, and conduct those reviews as scheduled in order to maintain updated procedures and training. As required by a Safety Management System approach, these reviews must include full consultation with groups including the Office of Emergency Management (OEM), engineering departments, the Rules Committee, and front-line workers to ensure the documents are practical and improve safety.

Finding 13:

Ride alongs are not effectively utilized to increase controller knowledge, contributing to a lack of controller understanding of what is actually happening on the roadway.

Ride alongs required for operations familiarization and recertification are being treated as required to check a box, rather than as an opportunity to provide important real-world experience to controllers that could improve their effectiveness and boost productivity of all roadway workers. In 2015, the FTA's SMI found controllers lacked practical experience and territory familiarization, which led to creation of this specific field day program, but controllers are not being allowed to actually gain the intended knowledge because they are kept isolated in locations like maintenance vehicles for hours while the actual work is being done.

Corrective Action: Metrorail must ensure that each controller has the PPE required to take advantage of the ride alongs, including work boots, and must direct work crews to allow controllers to fully observe and, as appropriate, ask questions regarding work activity. Ride alongs (road days) must include actual experience in all parts of the system to provide territory familiarization in addition to the understanding of how work crews function on the roadway.



Finding 14:

Controllers are not provided with the full extent of training necessary to do their jobs, including sufficient familiarization with roadway operations and procedures.

WMATA discontinued Level IV RWP training for controllers, which prevents the controllers from having a full understanding of Roadway Worker Protection (RWP) rules and actions on the roadway. Controllers must have the same understanding of RWP rules, track access and other protection policies that track personnel have. They are authorizing people to do a job; they should understand what they are authorizing those people to do. A lack of Level IV training contributes to a lack of detailed understanding of what is happening in certain situations, particularly for controllers new to Metrorail and for those on the overnight shift when there are a significant number of work crews on the roadway. This training, along with improvements to the ride along program, will significantly improve safety and understanding.

Corrective Action: New controllers must complete RWP Level IV training as part of the initial training class, and each working controller must maintain the highest level of RWP training.

Finding 15:

Aspects of ROCC training are inconsistent and must be structured. Multiple controllers reported that significant time is wasted during initial training.

Once on the job, management then directs controllers to ignore training on procedures and use of checklists. Recertification training, when provided, does not always include key safety details and reviews such as how to operate emergency ventilation fans. Some controller training courses have also been unilaterally shortened by management, and larger classes have posed challenges to completing all specific exercises for each trainee. These issues are compounded by repeated, and sometimes conflicting, direction from management to ignore procedures once controllers are on the job.

Corrective Action: Each training class must follow a consistent, specific daily lesson plan and schedule, and provide adequate time and opportunity for students to fully grasp all operational rules, procedures and other requirements. Such daily lesson plans and schedules must be structured to provide adequate training in the most efficient amount of time.

Finding 16:

Required on the job training (OJT) is not carried out in a structured or standardized fashion.

OJT standards are required to be sure new or returning controllers are adequately prepared for their roles on all shifts. Controllers are simply assigned a



Finding 17:

trainee without guidance on what information or skills must be conveyed or how to achieve that.

Corrective Action: Metrorail must identify, create training materials for, and adequately train on the job training instructors in the Rail Operations Control Center, and provide an on the job training guide for the instructors. On the job instructors must be sufficiently experienced to provide the training and understand how to provide coaching on tasks and procedures. Metrorail must create procedures to document and review training and evaluations, including the specific minimum requirements trainees must meet, the requirements for each mark given in performance reviews, and specific steps to be taken if a student requires additional instruction or experience.

Not all controllers experience emergency drills. If each ROCC controller does not get this experience, it diminishes the value of the drills.

Controllers are only involved in the formerly quarterly emergency drills if they happen to be on the desk involved at the time of the drill.

Corrective Action: Metrorail must ensure that each controller and assistant superintendent is involved in emergency drills (quarterly or otherwise) on a regular basis. This training must be documented for each individual.

Finding 18:

The certification process for ROCC instructors, assistant superintendents, superintendents and controllers is inconsistent, not properly documented, and lacks proper controls to ensure the integrity and meaning of certification.

ROCC instructors and ROCC managers are certifying their own colleagues. Assistant superintendents are sometimes certifying or recertifying controllers who those managers need on duty given current staffing shortfalls. Direct supervisors, such as assistant superintendents, should not have certification responsibilities, since that can create conflicting incentives to certify even controllers who are not meeting all requirements. Metrorail has made similar conclusions regarding the past certification practices for other operations employees, which led to the use of the RTRA Quality Assurance/Quality Control (QA/QC) group to certify other RTRA employees. Controllers and managers agreed that the current certification process is “a farce” or “a joke”.

Finding 19:

Corrective Action: The ROCC certification process must be standardized and codified for each position, and overseen by an independent group. The process must not involve Metrorail managers who would face challenges due to staffing and scheduling issues if the employees they are certifying were denied certification due to valid safety concerns. Each certification process must include objective and impartial evaluation of each individual's capabilities by a department such as the RTRA Quality Assurance/Quality Control (QA/QC) group.

Certification and recertification scenarios required of ROCC employees are repeated year after year, diminishing the value of the testing and training process.

The limited number of certification scenarios are known to controllers prior to the testing, allowing for preparation only for those limited situations. Scenarios also do not include time limits for specific procedures, only time limits to complete all tasks, which means in a 30 minute fire and smoke scenario, a controller could theoretically pass by activating fans properly after 29 minutes. Controllers and managers agreed that the current certification process is "a farce" or "a joke".

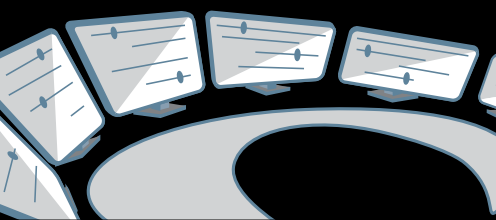
Corrective Action: After Metrorail transfers control of certification to an independent group, that group must evaluate and update the entire certification process and requirements. The update must institute a randomized or constantly rotating selection of scenarios for certification testing so that the process actually evaluates the broad capabilities required of instructors, controllers, assistant superintendents and others. The process must also include clear parameters for passing or failing at each step.

Finding 20:

WMATA does not have a standardized training program for personnel working at desks such as the MOC or ROIC. Metrorail could not provide any documentation of MOC training materials, a curriculum or a training description. Metrorail provided only a study guide for the ROIC.

These positions play important roles in emergency response, communication and work crew dispatching. Each employee working these desks must be provided the opportunity to learn all relevant rules in a standardized fashion.

Corrective action: Metrorail must establish minimum training and certification standards for each position in the ROCC to ensure competence to perform the job, including associated training courses, qualification requirements and requalification requirements.



Finding 21:

WMATA does not have minimum training requirements for Metrorail employees or contractors who serve in the fire liaison position.

From March to July 2020, Metrorail used OEM personnel in the fire liaison position without always providing training or instruction on the responsibilities and requirements of the job. Although the temporary changes due to the pandemic are not a focus of this audit, the use of these personnel and interviews conducted as part of investigations revealed a gap in Metrorail policies and procedures.

Corrective Action: If OEM or other Metrorail personnel or contractors are going to be used in the fire liaison role, each must be fully and specifically trained for the role. Metrorail, in cooperation with regional fire chiefs and other appropriate groups, must establish training and knowledge requirements and provide that training, along with regular refresher training, to any person who may fill the fire liaison role. In order to meet this requirement, Metrorail must maintain a list of any and all individuals who could be assigned to the fire liaison position and track their compliance with these training requirements.

Next Steps

Consistent with the **WMSC Program Standard**, WMATA is required to propose CAPs for each finding no later than 45 days after the date of this report. Each proposed CAP must include a specific and achievable planned action to remediate the deficiency, the person responsible for implementation, and the estimated date of completion. These proposed CAPs must be approved by the WMSC prior to WMATA implementation.





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