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Washington Metrorail Safety Commission

Metrorail's Improper Power Restoration

May 17, 2022

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1. Background and Overview

As documented below, Metrorail is continuing to put its personnel at risk of serious injury or death by repeatedly bypassing safety redundancies in power restoration procedures that Metrorail has deliberately designed for the safety of its employees, contractors and first responders.

Metrorail routinely removes high voltage electrical (third rail) power from track segments when work zones are established. Removing traction power from work zones temporarily removes the hazard of lethal electric power from areas where workers will be present. During overnight hours, after passenger service has ended, several such work zones are established. Prior to the start of passenger service, as field personnel report clear of their work zones, personnel coordinate the restoration of traction power. The intent is to return potentially lethal electric power required for train service only after workers are safely clear of the roadway. The number of overnight work zones and the impending start of passenger service can lead to elevated workload. It is during this early-morning period of high workload and multiple power restorations that adherence to established procedures is particularly necessary to protect human life; nonetheless, procedural shortcutting is continuing to occur.

These deviations from safety requirements have occurred both prior to Metrorail's implementation of a new Power Desk and since Metrorail launched the new desk in March 2022, which was intended to prevent these deviations. This includes the initial circumstances identified by the WMSC in a May 12, 2020 finding, additional circumstances the WMSC identified beginning in January 2021 that circumvented interim safety procedures, and new circumstances the WMSC identified under the new power desk that launched in March 2022.

In each instance, the WMSC explained to WMATA the safety deficiencies and the serious risk to Metrorail personnel, has required immediate safety improvements, and has provided WMATA with the opportunity to protect the safety of its personnel through long-term changes. However, Metrorail has yet to effectively provide for that safety, and continues to ignore processes and procedures that Metrorail intended to make the system safer.

Prior Actions and Notice

The WMSC identified and issued a finding in May 2020 that third rail power restoration is routinely rushed by Metrorail's Rail Operations Control Center (ROCC) management with a focus on restoring train service rather than a focus on following safety procedures.

As a result of the May 12, 2020 finding, Metrorail proposed and began implementing a corrective action plan (CAP), C-0037. During the implementation process of long-term solutions, Metrorail instituted interim safety measures as part of this CAP.

The WMSC, through our independent oversight, identified in January and February 2021 that Metrorail was bypassing those interim safety measures that were intended to assure the safety of personnel. The WMSC communicated this hazard to Metrorail for resolution.

Also in winter 2021, Metrorail submitted a CAP change request to shift certain power responsibilities to an expanded Power Desk, rather than focusing on steps to ensure that management and leadership in the ROCC permitted Rail Traffic Controllers to follow processes to be certain that power is only restored when it is safe to do so as confirmed by an independent safety approval from Power Desk personnel. Metrorail developed the revised Power Desk plan in place of its original proposed solution to prevent premature restoration of power based significantly on an assessment of practices at other agencies. The WMSC provided detailed and specific feedback regarding Metrorail's proposal. Metrorail decided to move forward with an expanded Power Desk. As Metrorail has moved forward with its preferred Power Desk plan, the WMSC has provided safety feedback that Metrorail could use to ensure its plan provided for the safety of Metrorail personnel and first responders. Throughout the CAP implementation process, the WMSC provided frequent feedback and items for Metrorail's consideration to provide Metrorail with every opportunity to prevent and mitigate hazards. Eventually, this feedback included the WMSC insisting in fall 2021 that Metrorail address safety concerns that had been repeatedly raised by frontline workers, but that Metrorail had ignored.

Metrorail's failure to address these safety issues that had been raised by its own employees, including concerns associated with procedures, training and workload requirements, until after the WMSC insisted on the importance of Metrorail adhering to the safety management system (SMS) approach specified in WMATA's Public Transportation Agency Safety Plan (PTASP), led to Metrorail postponing the implementation of new Power Desk procedures until Metrorail could conduct additional work to improve the safety of those procedures. Metrorail had not ensured that it was ready to safely launch the Power Desk. The WMSC ensured that Metrorail acted on its employees' valid safety concerns. Throughout this CAP process, the WMSC repeatedly identified areas where Metrorail could choose to improve these procedures. Metrorail emphasized to the WMSC that Metrorail was certain they were implementing appropriate alternative safety controls.

Metrorail again postponed the implementation of new Power Desk procedures in early 2022 due to Metrorail's ineffective planning and ineffective safety certification process to ensure that its equipment was ready for launch. For example, Metrorail had not identified that it lacked functioning microphones, functioning phone recording systems, and other safety technology needed to operate the Power Desk and to ensure accountability, documentation and continuous

safety improvement. When the WMSC again raised this issue, as had already been identified related to ROCC recordings in the ROCC Audit issued in September 2020, Metrorail eventually committed to addressing the recording deficiencies known to the WMSC at that time. Specifically, this included ensuring recording systems were in place at the backup ROCC at the Jackson Graham Building.

Metrorail launched the new Power Desk procedures in March 2022. These procedures include Power Desk Assistant Superintendents and Power Desk Controllers with responsibilities for interacting with and confirming steps necessary for safe power restoration with Rail Traffic Controllers and Roadway Workers In-Charge (RWICs) in the field. Metrorail initiated the Power Desk with three Power Desk Operations Desks, each of which is intended to have at least one Power Desk Controller assigned. The consoles align with the three territories previously covered by Metrorail's Ops 1 (Red Line), Ops 2 (Orange and Silver Lines, plus Blue Line at Rosslyn Station and in Maryland) and Ops 3 (Yellow and Green Line, plus Blue Line in Virginia south of Rosslyn Station) Rail Traffic Controller desks.[1]

The safety events described below demonstrate the same type of shortcutting of critical safety procedures has occurred under this new Power Desk as the WMSC identified and communicated to Metrorail prior to the May 2020 finding regarding premature, rushed and unsafe third rail power restoration, and as the WMSC identified and communicated to Metrorail in winter 2021 that Metrorail had not identified or acted upon on its own. In each case, Metrorail personnel made up their own actions and shortcutted procedures rather than following the redundancies deliberately engineered into the process for safety. As a result of the WMSC's independent oversight identifying these issues in 2020 and 2021, Metrorail then committed to safety and staffing improvements.

However, as demonstrated by these events and the WMSC's ongoing communications with Metrorail, Metrorail has ignored its safety processes in several situations and has improperly restored power when personnel were on the roadway.

April 26, 2022: Power restored under active work crew

On April 26, 2022, Metrorail skipped specific safety steps required by its safe power restoration procedures as Metrorail personnel in the field and in the Rail Operations Control Center (ROCC) were preparing to restore traction power to multiple locations for the start of passenger service

At 4:03 a.m., a tag[2] was incorrectly turned in by the Button Rail Traffic Controller. This is one of multiple tags the Rail Traffic Controller turned in to the Power Desk at that time. The other tags were correct. The return of a tag indicates that the Rail Traffic Controller believes it is safe to

[1] Rail Traffic Controllers now also operate an Ops 4 desk that covers part of the Orange and Silver Lines previously covered by Ops 2. Power Desk management decided not to include a fourth Power Desk Operations Desk in the Power Desk launch, but stated one may be used in the future.

[2] A power tag is a specific identifier for an area where power is de-energized. Power tags may be *red tags* indicating additional protection implemented by physically racking out circuit breakers to provide an additional level of protection for personnel in the field against improper power restoration or *supervisory tags* that are initiated by personnel in the ROCC remotely opening circuit breakers. This is described as a supervisory outage as it relies solely on the remote operation of the circuit breakers.

restore traction power to the work site, however these workers were not yet clear of the roadway in the area of College Park Station. The intent of redundant power restoration procedures is to ensure that such a mistake is identified before power is improperly restored. Between 4:03 a.m. and 4:20 a.m., when power was improperly restored in that work location, this Power Desk Controller and this Power Desk Assistant Superintendent were working to restore power to at least 12 work locations over just those 17 minutes.

The preliminary investigation demonstrates that the Power Desk Assistant Superintendent directed a Power Desk Controller to restore power even though the two required independent safety confirmations from the RWIC (one to the Power Desk Controller and one to the Rail Traffic Controller) had not been completed. The Power Desk Controller restored power even though they knew that the confirmations had not been completed. The Button Rail Traffic Controller had incorrectly indicated that power could be restored, even though confirmation had not been completed. A further safeguard was bypassed when the WMATA contractors Metrorail had designated as Third-Party Safety Officials (TPSO) who Metrorail stated were in place in the ROCC to ensure there was no procedural shortcutting did not intervene to prevent this safety issue. The TPSO report incorrectly stated that there was some confusion that was resolved immediately. In addition, the required power restoration warning announcements that are part of Metrorail's procedure meant to provide personnel in the field an opportunity to object to improper power restoration were not made.

General Orders and Track Rights System (GOTRS) records show that the Power Desk Controller did not confirm the RWIC was clear until 4:27 a.m.[3], and the Rail Traffic Controllers did not confirm the RWIC and the piggyback crew with the RWIC were clear of the roadway until 4:37 a.m. The RWIC reported to the Rail Traffic Controllers at 4:30 a.m. that the crew was clearing. Due to the improper power restoration, the Radio Rail Traffic Controller asked the RWIC to call on the phone for further discussion. After the RWIC actually cleared the roadway, the Rail Traffic Controller informed the RWIC that power had been improperly restored in their work zone.

Metrorail's procedure states that power cannot be restored until all required steps, including both the Rail Traffic Controller and Power Desk Controller confirming the work crew clearing the roadway, are completed in GOTRS. That safety procedure, which Metrorail stated provided safety redundancy, did not work. There were no engineering controls to require it, and those involved did not use the procedure.

[3] The Power Desk Controller has no authorized way to directly contact a RWIC on the roadway to request clarification on the work crew's status, as Metrorail has directed that the Power Desk Controller not use the operations radio channel (Ops 1, Ops 2, Ops 3, Ops 4) governing the line they are responsible for, instead using a separate Traction Power radio channel, and the use of a cell phone by the RWIC on the roadway is not permitted under Metrorail's electronic device policy because such use would pose a hazard. The Power Desk Controller can only communicate with the RWIC in compliance with Metrorail rules and procedures when the RWIC calls the Power Desk phone line or if the RWIC has cleared the roadway and is permitted to use their cell phone. However, it is common practice to collect RWIC phone numbers when issuing outage tags.

These procedures had received extensive focus, were the basis for significant training, and had been discussed in detail with power personnel.

Nonetheless, Metrorail personnel bypassed the redundant safety protections of the separate confirmations of the Roadway Worker In-Charge (RWIC) with the Power Desk Controller, followed by the confirmation by the Power Desk Assistant Superintendent that both the Rail Traffic Controller and Power Desk Controller have completed required safety steps. The sole reliance on the Button Rail Traffic Controller's incorrect statement that the RWIC was clear of the roadway completely undermines Metrorail's repeated assurances to the WMSC, in response to specific WMSC questions and comments over the course of nearly two years, that the new procedures provide redundant protections against improper power restoration.

In addition, the Power Desk Assistant Superintendent is supposed to provide oversight of the process, but, as this event demonstrates, can circumvent the safety process Metrorail has developed. While Metrorail developed its Power Desk process, the WMSC asked a number of questions related to sufficiency of procedures, supervisory oversight and training, and Metrorail assured the WMSC that these would be addressed. This event demonstrates that, rather than Metrorail's commitment that this new process is relying on a two-party system to ensure redundant protections, in fact, Power Desk personnel can act independently outside of the established safety process.

Power Desk Controllers stated that Power Desk personnel are regularly acting based upon personal notes rather than the safety steps required in Metrorail's procedures that require entries in the GOTRS system, partly because Power Desk personnel believe this circumvention of safety requirements results in a quicker process. This is expressly contrary to the purpose of these safety precautions to slow the process down to ensure power is only restored when safe to do so. This indicates that Power Desk personnel do not understand or do not respect the need for these safety precautions. This is particularly concerning as Metrorail stated repeatedly to the WMSC, even after the WMSC identified and raised numerous specific issues related to a rehearsed demonstration of the system for the WMSC, that Metrorail had extensively stress tested the system and that Metrorail had assured appropriate numbers of and training for personnel.

This investigation demonstrates that the requirement to utilize GOTRS checklists to ensure that each step has been followed is ineffective for safety. As the WMSC has raised previously, Metrorail must focus on updating to a more current version of the Advanced Information Management (AIM) system[4], which may include controls such as those that Metrorail initially planned and that the WMSC has suggested to Metrorail as a potential process improvement that would provide, for example, for a Rail Traffic Controller to enable the closure of a circuit breaker, and then separate authority for only a Power Desk Controller to close that breaker and re-energize

[4] The AIM system is Metrorail's software used by Rail Traffic Controllers to remotely monitor and control train movement and signals and to de-energize third rail power. It is used by Power Desk personnel to remotely re-energize third rail power.

power[5]. Such an update would ensure that circuit breakers are not closed until all steps are completed by both the Rail Traffic Controller and Power Desk Controller, ensuring a true double-check. This event demonstrates that the protections that Metrorail stated were present in the Power Desk process are insufficient, do not actually exist, and do not actually provide the level of protection that Metrorail repeatedly represented during its Power Desk development and implementation process. As specified below, Metrorail must implement an IT solution that provides and enforces the required level of protection[6].

April 3, 2022: Confusion, missing recordings

The WMSC is also continuing to investigate a safety event that occurred on April 3, 2022. The RWIC did not request foul time[7] to access the roadway, but told the Power Desk Controller that they had entered the roadway and confirmed power was de-energized. The Power Desk Controller issued a red tag. The Power Desk Controller is not made aware of foul time requests.

The details of this event, and the exact gaps in the process as executed, are unclear because recordings of calls to the Power Desk Controller were not available to determine those details. However, WMSC investigation identified some information from ambient recordings. Preliminarily, there appears to have been confusion among the Power Desk Controller, RWIC, and Rail Traffic Controller, in addition to other potential safety concerns. Further, Power Desk communications in this event did not include full required repeat backs, full power tag identifications, or complete use of alphanumerics as required by safety procedures.

Without details from complete audio recordings, it will be difficult to determine what specific safety improvements are needed to prevent such safety events in the future.

After that event, the limited recording features that had been functioning for Power Desk Controller telephones appear to have been lost for the days following the event through the April 26,2022 event. The investigation has determined that Metrorail IT personnel did not follow Metrorail's safety and change management procedures to ensure that changes were conducted properly, had the desired effect, and did not introduce additional hazards. This improper change management meant that Metrorail did not ensure that the telephone system and the separate

[5] A circuit breaker is an electromechanical switch that is closed to permit electricity to follow (energize) an electrical pathway and opened to interrupt (remove power from) that pathway. Traction power circuit breakers, which are located throughout the Metrorail system, can be remotely opened and closed from the ROCC using AIM. In AIM, remotely closing a circuit breaker to restore power requires a two-step process: (1) an "enable close" command allows closure, and (2) a subsequent "close" command actually closes that circuit breaker. The Power Desk procedures launched in March 2022 assigned the "enable close" command to Power Desk Assistant Superintendents and the "close" command to Power Desk Controllers.

[6] This AIM update to more current safety and operational procedures and functions could also provide for other safety improvements such as providing visual indications about which segments are underground or have fans so that Metrorail can better implement the new procedures it opted to develop with Plant Maintenance personnel rather than Rail Traffic Controllers activating fans in emergencies, and such as integration with other Metrorail systems to ensure that only trains that are supposed to be safely in service are allowed to continue in operation.

[7] Foul time is a form of Roadway Worker Protection (RWP) where Rail Controllers stop rail vehicle traffic in a specific area until the personnel on the roadway confirm that the work crew has cleared that area.

recording system were updated in a coordinated fashion, and it led to the failure to record some calls to and from Power Desk Controllers from at least April 14 through April 26.

Power Desk Controller phone recordings are not present for the April 26, 2022 event. Only the Power Desk Assistant Superintendent's phone was recorded. Power Desk Controller phones that initially were partly recording audio around the initial launch of the Power Desk were now recording nothing that was available for review. Ambient microphones recorded only part of other conversations.

As a result of the investigations into the April 3 and April 26, 2022 events, Metrorail IT committed on May 3, 2022 to certain improvements for changes connected to Metrorail's audio recording program (NICE):

1. All changes will be tested with the same rigor that is applied when a major project change/upgrade is made to the NICE application.

2. All Voice and NICE engineers will be crossed trained to ensure a higher level of knowledge on how the systems interface and work together.

3. Institute a daily sampling of recordings from both the Power [Desk] group and the ROCC.

May 1, 2022, May 6, 2022 and May 14, 2022:

Procedures not followed across multiple departments

The power restoration process developed by Metrorail requires close coordination among Rail Traffic Controllers, Power Desk personnel, and personnel in the field. In addition to scheduled work locations, this includes coordination during emergency events.

Personnel in the field must also follow power SOPs; however, events have already demonstrated that they are not following these procedures. From the time of the Power Desk launch through April 26, interviews demonstrated that RWICs were not calling the Power Desk Controllers to report being clear of the roadway as required by Metrorail's safety procedures to confirm that it is safe to restore power. As another example, on May 1, 2022, a change of RWIC occurred in the field, but the personnel did not call into the Power Desk as required to update the power tag information, which created confusion about safe power restoration.

In addition, on May 6, 2022, third rail power was re-energized in an active work zone on the Red Line. A Traction Power Crew entered a power room and did not follow required safety steps as they attempted to rack out circuit breakers for Track 1 to provide for a red tag outage. They appear to have racked out the wrong breaker, then replaced it. When the circuit breaker was replaced, the power crew manually closed a breaker without permission in violation of Metrorail rules and procedures. This re-energized power in the active work zone on Track 2. That circuit breaker had been remotely opened by a Power Desk Controller prior to being racked out to de-energize power for that work zone under a supervisory power outage, which the power crew in the field was not aware of. The Rail Traffic Controllers had directed the work crew on the roadway to stand clear

during the work in the traction power room. The investigation into the specific gaps, including in track access planning, work zone setup, and power procedures, is ongoing. This investigation also identified that, despite Metrorail's commitment following the April 26, 2022 improper power restoration event to address this safety issue, not all phone calls involving the Power Desk Controller relevant to the May 6, 2022 event were recorded. This includes a phone call between power personnel in the field and the Power Desk Controller. Metrorail issued a safety bulletin to personnel about this improper closure of a circuit breaker in the field without permission that created an immediate safety risk that had the potential to cause serious injury or death.

On May 14, 2022, Metro Transit Police Department (MTPD) personnel responded to an event at Columbia Heights Station and entered the roadway. However, when power was de-energized, the preliminary investigation suggests that there was no power tag created and communicated to personnel in the field by Metrorail personnel in the ROCC to ensure that power is only restored when safe to do so. The safe restoration procedure relies on a tag having been issued, however, Metrorail personnel working in the ROCC told the WMSC that there is no consistent procedure that they rely upon or have been trained on to ensure that such tags are issued in each unplanned power de-energization event. This includes that, even when tags are created during unplanned events, the tags are not consistently being provided to personnel in the field as required to provide the intended safety protection. The protection against improper power restoration is needed regardless of whether the unplanned de-energization is supervisory or red tag. WMSC data review of all unscheduled events that required power energization that triggered formal safety event notifications from Metrorail to the WMSC from March 13, 2022 (Power Desk launch) through May 6, 2022 demonstrates that out of the 12 applicable events, power outage tags were only created for three events.

Additional review of Metrorail's Standard Operating Procedure (SOP 2) as revised and implemented at the time of the Power Desk launch demonstrated that it does not clearly explain or properly use the term "emergency switch order," including applying this term to actions such as supervisory power outages that are not switch orders. Review of the procedure also demonstrated that not all GOTRS steps and responsibilities, such as the assigned responsibility to confirm energization of power in GOTRS, are specified in the procedure.

A review of procedures associated with the Power Desk also demonstrates that the amended process has eliminated previous layers of protection provided by both the Radio Rail Traffic Controller and Button Rail Traffic Controller jointly confirming that specific breakers were safe to close and re-energize, prior to power being restored.

These gaps are examples that demonstrate the importance of involving frontline employees in designing procedures, as these frontline employees have the experience executing these procedures that can help identify safety gaps. As described above, in the case of the Power Desk, Metrorail only acted in fall 2021 on safety concerns raised by frontline employees after the WMSC insisted.

Metrorail's culture of noncompliance

The investigation into the April 26, 2022 event, even at this preliminary stage, provides further evidence that elements of Metrorail have a culture that accepts noncompliance with written operational rules, instructions, and manuals[8].

The investigation demonstrates that Power Desk personnel, including supervision and management, did not follow the specific safety procedures that management specifically designed to assure safety. As described above, the WMSC has identified and communicated such procedural shortcutting with respect to third rail power restoration since at least 2020. This has continued despite multiple Metrorail process improvements and trainings intended to improve safety.

The investigation demonstrates that Metrorail's implementation of its training and oversight was deficient, that its implementation of technical controls in GOTRS meant to serve as a check on the process was deficient and allowed for Power Desk personnel, including the Assistant Superintendent, to skip safety steps, and that Metrorail's internal oversight it committed to as part of its plan to initiate this Power Desk under CAP C-0037 was ineffective.

WMSC analysis of additional data, comparing records in AIM to records in GOTRS, demonstrates that the Power Desk is consistently deviating from the Power Desk procedures and taking action in AIM before completing the required steps in GOTRS that are meant to verify that power restoration is being done properly. WMSC review of Metrorail data from April 10, 2022 through April 19, 2022 demonstrates that for at least one work location each day in that period alone, power was restored and the work location was closed out without following all required safety steps. For example, April 12 included at least three such work locations where required safety steps were not followed, and April 13, included at least four such work locations. This includes restoring power before completing all required steps that exist to ensure that power is only restored when safe to do so. Safety steps are being frequently skipped and circumvented.

Under Metrorail's power restoration procedures, the Power Desk Assistant Superintendent is required to verify that the RWIC separately reported being clear of the roadway to both the Power Desk Controller and the Rail Traffic Controller, and only then, after verifying this and acting in GOTRS, is the Power Desk Assistant Superintendent permitted to "enable close" on the specific circuit breakers in that area. In actual practice, as the data and interviews demonstrate, Power Desk Assistant Superintendents have been acting to "enable close" when the Rail Traffic Controller states that a RWIC is clear. Power Desk Controllers are then at times, including the April 26, 2022 safety event, closing breakers based solely on the Power Desk Assistant Superintendent having "enabled close," rather than based on completing each safety step in the process including independently confirming that the RWIC has cleared the roadway.

[8] For further information about this important safety concern, refer to Finding 1 of the WMSC's Audit of Rail Operations, which was issued on April 7, 2022.

In the April 26, 2022 event, even after safety concerns were raised among Power Desk personnel during the restoration process, the “prohibit close” function that is lifted when the Power Desk Assistant Superintendent “enables close” was never re-activated, and the circuit breaker controls in AIM remained in a state where the Power Desk Controller could close the breaker. The Power Desk Controller then acted on the Power Desk Assistant Superintendent’s instruction to close the breaker, improperly restoring power and endangering the work crew.

Metrorail established electronic systems that were supposed to serve as engineering controls on the process. However, in practice, these are only preventing administrative closeout of a power outage after power has already been restored and have no effect on the actual improper restoration of power. This has led to repeated requests from Power Desk Controllers to Power Desk Assistant Superintendents to enter actions into GOTRS only after the fact, which defeats the intended purpose of these controls to prevent the improper restoration of power by enforcing redundant safety checks.

The investigation into the April 26, 2022 event demonstrates that Power Desk Assistant Superintendents and Power Desk Controllers did not follow the safety steps in the process, and instead acted on their own notes and recollections, taken outside of the approved process.

Metrorail’s culture that accepts noncompliance continues to permit procedural shortcutting. Without cultural change, no amount of training will be sufficient. For designed checks and balances to be effective, the culture must respect these redundancies as enhancing safety – not view them as extraneous time consumers.

Fatigue, Staffing, and Workload

The Power Desk Controller in the April 26, 2022 event had worked overnight shifts, including five 12-hour shifts, in the five days before this event, and was more than 10 hours into a sixth consecutive 12-hour shift at the time of this event.

Fatigue modeling indicates that the Power Desk Controller’s performance effectiveness on April 26 was impaired due to sleep debt, short sleep duration and the circadian effects of night work. The Power Desk Controller also told investigators that they have difficulty sleeping. Metrorail’s Safety Department confirmed that Power Desk personnel are working in safety sensitive positions requiring fitness for duty evaluation, such as regular medical exams. However, despite WMSC requests, Metrorail has not been able to provide any records of such evaluations or medical exams. Metrorail’s development of the Power Desk, including its safety certification process, appears to have failed to recognize and adequately mitigate this hazard of impaired Power Desk personnel by ensuring these fitness for duty steps were completed and adequate staffing achieved and maintained. The WMSC formally communicated deficiencies in Metrorail’s Fitness for Duty Programs in an audit report issued in August 2021, including that Metrorail is not conducting physical examinations required by its policies for safety sensitive employees, and Metrorail does not track when these physicals are due to occur. Metrorail has begun implementation of a CAP to address that finding.

Due to inadequate staffing, Metrorail is assigning 12-hour shifts and is not filling some shifts. The investigation also demonstrates the safety benefits of assigning more than one Power Desk Controller to each desk as Metrorail has done on some weeknight overnight shifts.

Metrorail told the WMSC prior to the March 2022 launch, that the Power Desk had 15 Power Desk Controllers and 5 Power Desk Assistant Superintendents, and that this was sufficient to launch its new Power Desk safely. On April 26, Metrorail had 15 Power Desk Controllers, 5 Power Desk Assistant Superintendents. Since then, there have been departures and promotions, and others are expected. Investigative interviews suggest Metrorail personnel believe that a minimum of approximately 20 Power Desk Controllers and 8 Power Desk Assistant Superintendents would be needed to adequately staff the desk around the clock at minimum safe levels.

The work schedule for April shows that many shifts are being covered by overtime, and other shifts are not being covered at all. For example, on Saturday April 2, and Saturday, April 30, only two Power Desk Controllers were working. On April 15 and April 16 morning shifts, only one of eight Power Desk Controller and Power Desk Assistant Superintendent shifts was covered by someone not working the shift entirely on overtime.

The investigation demonstrates that, despite Metrorail's pre-launch representation, the Power Desk is not sufficiently staffed.

The Power Desk Controller involved in the April 26, 2022 event reported that they were flustered due to a high and challenging workload as multiple crews turned in locations at the same time as Metrorail prepared to re-energize power to open for revenue service. The 17 locations this Power Desk Controller and this Power Desk Assistant Superintendent were handling is in line with the average nightly work locations for each of the three Power Desk Operations Desks over the two weeks from April 9 through April 23, 2022.

Metrorail launched the Power Desk in March 2022 with a limitation on the number of nightly work zones on each line. The stated intent was to gradually increase back to previous levels as the Power Desk demonstrated the ability to handle a larger number of outages. Initially, a low number of work locations provided ample opportunity for Power Desk personnel to be familiar with and process each location. WMSC review of data from the first two weeks of the Power Desk launch showed compliance with the specific power restoration safety procedures that the same Metrorail personnel later began to ignore. In recent weeks, Metrorail lifted the limitation on the number of work zones and returned to previous levels, significantly straining Power Desk personnel. Metrorail personnel stated that this cap was initially ended before Power Desk management believed that they were prepared for an increase in work zones. Metrorail personnel said that this unplanned increase in work zones occurred because of siloing and ineffective communication among Metrorail departments, despite the requirements of Power Desk implementation plans. Traction Power Maintenance leadership had wanted the work locations to remain capped at 12 for an additional week. By the time of the April 26, 2022 event, Power Desk management stated to the WMSC that they believed the Power Desk could handle the workload of additional locations each night.

Prior to the Power Desk's creation, Metrorail had executed a pilot project that capped the number of work locations at 15 per line to reduce ROCC workload. This pilot project demonstrated this cap could function well for Metrorail with effective planning and safe use of piggybacking work crews. Following the April 26, 2022 event, Metrorail stated that it believed that, if Power Desk and other personnel were properly trained and focused only on one outage restoration at a time, it is possible for the Power Desk to safely handle 15 work locations per night as long as there is significant additional internal oversight. This investigation demonstrates that Metrorail does not have proper staffing and training to safely handle a large number of work locations at this time. In addition, the need for such extensive additional internal oversight demonstrates the gaps in Metrorail's power restoration process and culture of compliance.

As the WMSC continued this investigation and emphasized the likelihood and severity of the consequences associated with these hazards, Metrorail committed to again limiting the number of work locations on each line, and to requiring a Power Superintendent to sign off on specific steps in the restoration process.

After committing to the WMSC to reducing the number of work locations, Metrorail conducted an average of 8 to 10 locations per Power Desk Operations Desk from April 30 through the morning of May 4. However, despite the commitment to have no more than 10 work locations per desk per night, on the night of May 4 into May 5, 2022, Metrorail conducted 39 work locations where power was de-energized, an average of 13 work locations per line. May 5 into May 6, 2022 continued this increased number of work locations.

When the WMSC raised these issues to Metrorail again on May 11, 2022, Metrorail personnel stated that their written commitment to the WMSC to limit the number of work locations to 10 work locations per desk was not being followed, and they were making a different commitment to cap the number of work locations based on the number of Power Desk Controllers who happened to be working on a given shift.

Even if the claim Metrorail personnel made that was contrary to their written safety commitments were true, WMSC review of data and schedules from the May 4-May 5 overnight shift, for example, demonstrates that only three Power Desk Controllers were working when Metrorail exceeded its cap on the number of work locations that Metrorail had committed to for the safety of its own personnel.

The claims regarding the number of work locations and the number of Power Desk Controllers that are on duty on a given night also do not match Metrorail's track access planning process that requires advance scheduling. In addition, if the claims were true, it would contribute to likely practical drift away from documented safety processes. Other Metrorail personnel acknowledged that the representations, if accurate, would be too confusing to carry out safely and properly.

Metrorail has compounded workload challenges for Power Desk personnel by routing all Power Desk phone calls through a single phone line. In response to WMSC suggestions prior to the launch of the Power Desk that dedicated phone lines for each Power Desk Operations Desk (Ops 1, Ops 2/4, Ops 3) would ease workload and make the process clearer and smoother for Rail Traffic Controllers, RWICs and Power Desk personnel, Metrorail stated at that time that

maintaining a single phone line would be less confusing and that they had extensively stress tested the new power restoration process. Metrorail has now stated it will institute dedicated phone lines; however, these dedicated lines are not yet in use by field personnel or Rail Traffic Controllers to ensure that each call reaches the correct person at the Power Desk.

Metrorail submitted CAP closure request

Despite these safety deficiencies, and the serious safety events that occurred, Metrorail submitted documentation to the WMSC on April 27, 2022 of a vote by the Safety Certification Review Committee (SCRC) approving a final Power Desk Safety Certification Verification Report (SSCVR). This vote had been conducted between April 8 and April 15, 2022. Metrorail also stated at that time, after power was improperly energized April 26, 2022 while personnel were working around the third rail, that the Power Desk as implemented, including staffing, training, procedures and communications, met all of Metrorail's safety requirements. Metrorail submitted a CAP closure request for C-0037 on April 29, 2022 stating that they had successfully implemented corrective actions to prevent these very safety failures. These statements are not accurate and must be addressed by actually providing for the safety of Metrorail personnel and first responders.

After the WMSC raised these issues to Metrorail for immediate mitigation and broader improvement, including informing Metrorail on April 27, 2022 and in following conversations that the WMSC was considering taking enforcement action, Metrorail on May 9, 2022 discussed making Power Desk changes under a revised CAP that could include establishing staffing requirements and compliance reviews. More systemic action is required to address these safety issues. The WMSC will continue to work with WMATA to ensure Metrorail identifies and implements safety improvements to protect the lives of its personnel.

Order of the

Washington Metrorail Safety Commission

On this day, May 10, 2021, the Washington Metrorail Safety Commission ("WMSC") issues the following order regarding Washington Metropolitan Area Transit Authority ("WMATA") Metrorail's power restoration:

WHEREAS, the WMSC has identified Metrorail's safety deficiencies related to power restoration that put Metrorail personnel at risk of serious injury or death;

WHEREAS, the WMSC is the designated State Safety Oversight Agency for the WMATA Rail System, as required by 49 U.S.C. § 5329(e)(3)(C);

WHEREAS, the WMSC's powers are established by the Washington Metrorail Safety Commission Interstate Compact (P.L. 115-54; 131 Stat. 1093) ("WMSC Compact"), passed into law by the Commonwealth of Virginia, State of Maryland, and District of Columbia and approved by Congress on August 22, 2017;

WHEREAS, among the powers granted to the WMSC under the WMSC Compact is the authority to "require, review, approve, oversee, and enforce the adoption and implementation of any Corrective Action Plans that the Commission deems appropriate" WMSC Compact § 30(c);

WHEREAS, among the powers granted to the WMSC under the WMSC Compact is the authority to "Compel WMATA's compliance with any Corrective Action Plan or order of the Commission by such means as the Commission deems appropriate" WMSC Compact § 31(c);

WHEREAS, among the powers granted to the WMSC under the WMSC Compact is the authority to "Take such other actions as the Commission may deem appropriate consistent with its purpose and powers." WMSC Compact § 31(f);

WHEREAS, WMSC Bylaws Art. VI.C.1. and VI.C.6.a authorize the Chief Executive Officer to issue directives to WMATA, and to issue directives to create and implement a corrective action plan and to conduct a hazard analysis; and

WHEREAS, WMSC Program Standard Section 9.C provides that a revised CAP proposal is required when another course of action is more appropriate, and the revised CAP proposal will be subject to WMSC approval in the same manner as all other CAPs;

IT IS HEREBY ORDERED that WMATA will:

1) Metrorail reduce the number of work locations requiring power de-energization and energization to no more than 30 per shift and to no more than 10 per shift per Power Desk Operations Desk until such time as:
    a) Metrorail conducts safety stand downs to:
        i) Re-emphasize to all ROCC and Power Desk personnel from frontline workers through management that redundant safety procedures are required to be followed for the safety and survival of their colleagues on the roadway. This must include explicit instruction to stop the power restoration procedure and

ensure prohibit close protections are restored in AIM if there is any question or doubt about the process, and a requirement that the power restoration process be re-initiated.

ii) Re-emphasize to all RWP-trained personnel the importance to their safety and survival of following all safety rules, including those related to third rail safety, proper communications with Power Desk and ROCC personnel, and each other step related to power energization.

b) Metrorail has complete, functioning recording systems for all Power Desk communications involving Power Desk Controllers and Power Desk Assistant Superintendents in each active facility; and these recording systems are tested and verified.

c) Power Desk personnel (including Power Desk Controllers, Power Desk Assistant Superintendents) receive additional training and evaluation to ensure they are capable of safely and effectively handling a specific higher number of outages per shift.

d) Metrorail provides appropriate staffing and succession planning for the Power Desk to comply with fatigue policies, standards and requirements by scheduling personnel with regular days off and shifts of appropriate duration.

e) Metrorail implements the use of dedicated phone numbers for each power desk for all RWICs, Rail Traffic Controllers and other personnel. For example, Ops 1 Rail Traffic Controllers must call the Ops 1 Power Desk, and Ops 1 RWICs must call the Ops 1 Power Desk directly for outages related to Ops 1 territory, rather than continuing to introduce confusion and increased workload by routing all calls through a single number regardless of location.

2) Metrorail's closure request for C-0037 is rejected, and:

a) Within 30 days, Metrorail must submit a revised CAP proposal per Program Standard Section 9.C that addresses the minimum corrective action of instituting 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, second approval from an appropriately qualified employee, so that safe power restoration is always placed ahead of service metrics such as on-time performance. As part of addressing that minimum corrective action, this must include, at minimum:

i) The necessary AIM and IT upgrades to ensure that power is only restored when it is safe to do so and all required steps are completed. This must include engineered protections in AIM (or successor) to ensure that power is restored only after the Rail Traffic Controller and Power Desk Controller have completed all required steps;

ii) The specifications for updated AIM, GOTRS and other systems that demonstrate the necessary controls and use of all current, available features of the AIM system that should be used to improve safety;

iii) An expeditious schedule for implementation of these safety features, including required change management and safety certification steps;

iv) Implementation of adequate Power Desk staffing in both the short-term and long-term;

v) Compliance with Metrorail's Fatigue Risk Management policies;
vi) Ensuring that Power Desk personnel undergo safety-sensitive medical examinations required by Metrorail policy to ensure that each individual is free of impairment;
vii) Revisions to procedures to address the safety issues identified, to address safety and operational concerns raised by Metrorail personnel, and to address those prior concerns that were not incorporated into the initial procedures. This may include new, specific, open opportunities for Metrorail personnel to provide this feedback to Metrorail management in a non-punitive setting, and the establishment and implementation of ongoing opportunities for such feedback;
viii) Appropriate initial and refresher training for all Power Desk, ROCC, and RWP-trained personnel on the procedures and each specific system and tool that is part of the procedures. For example, for Power Desk personnel, this must include effective initial and recurring training on AIM, GOTRS and other systems;
ix) The specific supervisory oversight and cultural improvements in place to ensure that the procedures are followed; and
x) An SMS implementation plan and schedule that covers Traction Power personnel, including Power Desk and field personnel, as part of the overall implementation of SMS throughout Metrorail.

b) Metrorail must restart and properly conduct its safety certification process, including a renewed review by the Safety Certification Review Committee, and must develop a new SSCVR that demonstrates that the Power Desk process is properly completed and safely implemented.
i) This must include a complete, updated operational hazard analysis based on the actual hazards demonstrated in the implementation of the Power Desk. Metrorail must then develop, implement and document both short-term and permanent mitigations for each hazard.

Digitally signed by David L. Mayer
Reason: I approved this document
Date: Monday, May 16, 2022 8:43:10 PM
DN: C=BE, O=GlobalSign nv-sa, CN=GlobalSign GCC R6 AATL CA 2020

David L. Mayer
Chief Executive Officer
Washington Metrorail Safety Commission