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STATE OF NEW YORK
**OFFICE OF THE STATE COMPTROLLER**

October 21, 2021

Janno Lieber
Acting Chairman and Chief Executive Officer
Metropolitan Transportation Authority
2 Broadway
New York, NY 10004

Re: Maintenance and Inspection of
Event Recorder Units
Report 2021-F-14

Dear Mr. Lieber:

Pursuant to the State Comptroller's authority as set forth in Article X, Section 5 of the State Constitution and Section 2803 of the Public Authorities Law, we have followed up on the actions taken by the officials of the Metropolitan Transportation Authority (MTA) – New York City Transit (Transit) to implement the recommendations contained in our audit report, *Maintenance and Inspection of Event Recorder Units* (Report 2018-S-19).

## Background, Scope, and Objective

MTA is a public benefit corporation chartered by the New York State Legislature. Transit is the largest public transportation agency in North America and one of the largest in the world. As of August 25, 2021, Transit has 6,455 subway cars that traveled over 665 miles of track and over 325 million miles during 2020. In 2000, Transit began to deploy its New Technology Train (NTT) cars (R142, R142A, R143, R160, and R188). In June 2020, the R179 train cars were deployed into revenue service. The NTTs are installed with Event Recording Units (ERUs) or "black boxes." ERUs are a valuable safety feature that allow for the monitoring of the train equipment and technical analysis of incidents/accidents based on data they record. ERUs are installed in the cars used by train operators and conductors. Each ERU has different capacities and attributes based on the model and age of the unit. In 1998, the Federal Railway Administration established that the ERUs must have a minimum of 48 hours of recording memory capacity. As of December 31, 2020, the average weekday ridership was 2,040,580 million, and in 2019 the average weekday ridership was 5,493,875 – a 62.8% decrease in weekday ridership.

The objective of our initial audit, issued on July 18, 2019, was to determine whether Transit complied with maintenance and inspection requirements pertaining to ERUs and whether Transit had a corrective action plan to fix ERU deficiencies that are identified. Our prior audit found that Transit was not in compliance with its ERU maintenance and inspection policy. For instance, train car inspections were not always done timely, and for 129 inspections, maintenance personnel did not provide evidence that they downloaded information from ERUs to ensure that they were functioning correctly, as required by Transit's work manuals. Model

R142 cars, which were brought into revenue service in 2000 after the federal guidance was issued, also were not up to industry standards of 48 hours of recording memory capacity, and Transit could not retrieve a download when it is requested for a non-emergency incident/ accident, primarily in cases where the ERUs have only 12 hours of memory capacity before their data is overwritten. Transit did not fulfill some download requests as a result.

Our initial audit report contained seven recommendations. The objective of our follow-up review was to assess the extent of implementation, as of September 13, 2021, of those recommendations.

## Summary Conclusions and Status of Audit Recommendations

We found that Transit officials have made progress in addressing the issues identified in our initial report. Of the seven prior audit recommendations, four were implemented, one was partially implemented, and two were not implemented.

## Follow-Up Observations

### Recommendation 1

*Ensure ERUs are inspected in accordance with Transit's maintenance and inspection policy and procedures.*

Status – Partially Implemented

Agency Action – We determined that not all the maintenance and repairs shops sampled performed ERU downloads during heavy "H" inspections, as required by Transit's Maintenance Manual. We sampled five of 13 maintenance shops and found that two shops, the 207th Street and East New York shops, do not perform required ERU download inspections. The 207th Street shop advised us that it maintains only the new R179 cars, and thus it relies on the train's advanced monitoring system to know if the ERU is operating properly. The East New York shop does not perform required ERU downloads and relies on the Train Operating Diagnostics (TOD) indicators to show if there is a problem with the ERU connection. However, the TOD cannot tell if there is a channel that the ERU is not recording; therefore, while the TOD can show if the ERU is running, it cannot tell if the ERU is working as intended. The other three shops follow Transit's maintenance manuals.

In addition, Transit maintenance and inspection policy requires that ERUs are maintained and inspected every 10,000 to 12,000 miles or every 68 to 78 days, whichever comes first. We found 34 inspections were done late at three shops.

### Recommendation 2

*Expand ERU testing to include analyzing downloads.*

Status – Implemented

Agency Action – On April 16, 2019, Transit officials signed and released a revision notice to expand ERU testing to include a download. This notice was issued for each car model. The manual states that, on every heavy "H" inspection, a full download should be performed and several elements be tested to see if the ERU is functioning for each car model.

## Recommendation 3

*Increase the hard memory module capacity for R142s and R142As to be in compliance with the industry standard.*

Status – Not Implemented

Agency Action – On June 16, 2021, Transit officials advised us they had not decided whether to upgrade the R142 and R142A memory or replace the units. Since then, according to Transit officials, they purchased 10 kits to be installed to upgrade the ERU. The ERUs will arrive in January or February 2022.

## Recommendation 4

*Ensure Operations and System Safety is cognizant of the maximum time frame for requesting ERU downloads to be retrieved.*

Status – Implemented

Agency Action – Transit issued a memo on May 17, 2019 advising officials from Rail Train Operations, Rail Control Center, and Safety to make requests for downloads promptly because, depending on the ERU's model, some have a memory capacity of 12 hours while other have over 48 hours. From July 21, 2019 to August 27, 2021, there were approximately 1,000 logged ERU incident/accident events that occurred and 64 ERU downloads were either overwritten or unfulfilled, representing 6%. This is lower than the 11.4% of downloads that were either unfulfilled or overwritten during the prior audit.

## Recommendation 5

*Designate personnel within each maintenance shop to perform data entry so the RSMIS for the maintenance department is comprehensive.*

Status – Implemented

Agency Action – We visited five maintenance shops and were told that only supervisors enter data into the Rolling Stock Management Information System (RSMIS). At one shop, the mechanics enter data into the ERU Scheduled Inspection form, but the supervisor pulls up the form to review it, approve the data, and sign off and then enters the report in RSMIS. We reviewed the ERU Inspection Report in RSMIS from July 1, 2019 to June 23, 2021 and noted that each inspection was signed by one of the shop's supervisors.

## Recommendation 6

*Develop a more detailed work manual to include specific steps pertaining to ERUs and ensure consistency in testing across ERU models.*

Status – Implemented

Agency Action – We reviewed the work manual for ERU models R142, R142A, R143, R160, and R188. We compared the old ERU section of the work manual to the updated version of the ERU section of the work manual and found that Transit had updated the manual. However, we found inconsistencies in performing ERU downloads among the five shops we visited: two shops followed the manual; one shop never performed ERU downloads and only relied on the monitoring diagnostic system; one shop does ERU downloads

at each inspection, and the shop official sends the ERUs to an outside vendor for repair and not to the Central Electronics Shop (CES); and the last shop never received training to perform a download on the new R179 ERU – the ERUs were still under manufacturer's warranty.

## Recommendation 7

*Develop a Plan with steps that, at a minimum, address identifying an ERU malfunction, removing and replacing an ERU, and sending and repairing the ERU at the CES.*

Status – Not Implemented

Agency Action – At the opening conference, Transit officials said that they continue to disagree with this recommendation and thus have not implemented it. We obtained a listing of ERU repairs from July 1, 2019 to September 2, 2021 for three of the five shops we visited and compared the CES listing with the Repair by Equipment Report for ERUs. We found that CES showed that they had repaired seven ERUs, but the RSMIS report showed no ERU failures for the Coney Island shop. Thus, we conclude that records at CES and RSMIS still do not show the same status for the ERU.

Contributors to this report were Robert C. Mehrhoff, Erica Zawrotniak, Katrina Lau, and Aurora OV Caamano.

We would appreciate your response to this report within 30 days, indicating any actions planned to address any unresolved issues discussed in this report. We thank the management and staff of the MTA for the courtesies and cooperation extended to our auditors during this review.

Very truly yours,

Carmen Maldonado
Audit Director

cc: M. Woods, MTA, Auditor General
    D. Jurgens, MTA, Assistant Auditor General
    Division of Budget