Review of MARC Train 538 Incident on June 21, 2010

Final Report

Maryland Transit Administration
12/15/2010

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MARYLAND TRANSIT ADMINISTRATION

MARYLAND DEPARTMENT OF TRANSPORTATION
Martin O'Malley, Governor • Anthony G. Brown, Lt. Governor
Beverley K. Swaim-Staley, Secretary • Ralign T. Wells, Administrator

MEMORANDUM

TO: Beverley K. Swaim-Staley
Secretary

FROM: Ralign T. Wells
Administrator

DATE: December 15, 2010

SUBJECT: Review of MARC Train 538 Incident on June 21, 2010

Following the June 21, 2010 incident involving MARC Train 538, you directed the Maryland Transit Administration (MTA) to conduct a thorough review of MARC Train operations with the specific goal of identifying factors that contributed to the incident. Additionally, you directed the MTA to develop measures to reduce the chance of such an incident occurring again. Working with Amtrak and peer commuter rail operators across the country and with the assistance of knowledgeable consultants, the MTA has completed this review. This memorandum identifies what I have determined to be critical factors that contributed to the incident and specific steps MTA has taken to address them. Attached are documents generated by this process, as follows:

1. A report on the incident compiled by MTA and Amtrak as a result of the CFR 239 Review process;
2. An evaluation of MARC operations and procedures compiled by independent consultant Booz Allen Hamilton. This evaluation includes recommendations for longer term operational and structural changes within the MTA to address areas that contributed to the incident; and
3. A matrix outlining the comprehensive list of steps taken by MTA in the days, weeks and months following the incident to promptly address issues that contributed to the incident.

As a result of this exhaustive review process, I have determined that there were several key factors that contributed to the serious nature of the incident. These factors are listed below along with substantive steps taken by Amtrak, MTA or both to address the issues.

FACTOR: Failure of Critical Component on HHP Electric Locomotive

MARC Train 538 was powered by an HHP-8 locomotive, one of six MARC operates on the Penn Line. (MARC also operates four AEM-7 electric locomotives.) An HHP is capable of pulling and providing power to a nine-car train which is the largest operated by MARC. On June 21, the main circuit breaker (MCB) tripped, leaving the train without propulsion or head-end power that provides ventilation for the passenger coaches.

The cause of the MCB trip was identified as a critical failure of two electronic components: 1) the #2 Advanced Generic Alstom Traction Electronic (AGATE) which is one of five computer processors in the propulsion network, and 2) the Remote Input Output Module (RIOM) which is an electronic device that regulates power among the four traction motors and the head-end power. A subsequent investigation failed to identify the specific reason for the failure of the AGATE and RIOM, but the likely cause was a combination of high ambient temperatures in the engine compartment and/or a momentary fluctuation in the voltage supplied by the overhead catenary system.

Amtrak and MTA had previously identified AGATEs and RIOMs as vulnerable components on the HHP-8 locomotives and several modifications have been made in the 10 years the locomotives have been in service.

After failing to re-start the locomotive the engineer requested assistance from an Amtrak technician and then a rescue locomotive. The situation was exacerbated because the rescue train crew was unable to achieve adequate air pressure to release the brakes that had engaged when the locomotive shut down.

> CORRECTIVE ACTION: Address conditions that put additional strain on electronic components with the engine compartment; utilize protect locomotives where practicable; reduce length of trainsets

First, Amtrak and MARC have implemented modified maintenance procedures that include more frequent cleaning of the filters and radiators that cool the engine compartment. Through a separate project scheduled for completion in February 2011, Amtrak is upgrading the substations that feed the catenary in the vicinity of Union Station. MTA also funded the installation of a Maintenance Events Analysis Program (MEAP) that provides real-time information on the health of the locomotive. MEAP consists of on-board computers and modems that receive inputs from existing locomotive diagnostic systems and forwards this information to Amtrak via an on-board cellular phone, and will help to predict the conditions that lead to a RIOM failure.

Second, since the incident our policy with regard to the make-up of trainsets is to provide a second "protect" locomotive on large trainsets during extreme weather conditions. The protect locomotive could be either electric or diesel, but in MARC operation diesel locomotives are generally more reliable and not dependent on the availability of external power sources.

Third, MARC and Amtrak are developing a proposal that would decrease the length of Penn Line trainsets in favor of more frequent service. At the present time the longest trainsets are eight or nine cars. Running trainsets of six or seven cars and thereby reducing the weight being pulled and the power required to operate the heating and cooling system and lights will place less strain on the locomotives. This is expected to translate into improved performance of the electrics, particularly in extreme hot weather. To make up for the loss of capacity, two additional trains would be added to each peak period. From a customer service perspective, this will be a benefit by improving service reliability and increasing travel options. Public hearings are required before implementing this or any significant schedule change.

FACTOR: Failure of Amtrak to effectively communicate accurate and timely information to MARC management throughout the duration of the incident

Throughout the duration of the incident, Amtrak, the contractor operating the MARC service on the Penn Line, failed to provide the MARC Communications Center with complete and accurate information regarding the situation as it evolved. Under normal operation, our contact is the Commuter Desk located in Union Station. The Commuter Desk in turn gathers and relays information from other sources with Amtrak. On June 21, the communications protocol was inadequate, including, for example, inaccurate initial reports that the train was stopped in a location that was not accessible (it actually was located adjacent to US 50) and a failure to accurately characterize the deteriorating conditions for passengers on board.

CORRECTIVE ACTION: Establish lines of communications with senior Amtrak Operations staff

Following the incident, MARC established additional lines of communication with senior Amtrak operations staff. In the event of a significant service failure MARC management now has a direct pipeline to contact Amtrak's General Superintendent for the Mid-Atlantic Region. If necessary, we have the ability to move up the Amtrak chain of command to make direct contact with Amtrak's General Manager for East Transportation. These contacts will ensure that MARC incidents receive the attention that is required to prevent them from escalating to unacceptable levels.

FACTOR: Failure of the Amtrak personnel on-site to focus on the well being of the passengers as they attempted to resolve mechanical issues with the locomotive

While it should be noted that Amtrak maintenance personnel worked diligently to resolve the mechanical issues that caused the locomotive to fail, Amtrak personnel failed to adequately understand the urgency of the situation and the impact rising temperatures in the closed rail cars was having on the passengers. Their focus was on mechanical factors, not human factors.

CORRECTIVE ACTION: Provide additional training for train crews in incident management; dispatch additional Amtrak managers to the scene

Amtrak will conduct training for train crews on Incident Command System procedures in the passenger railroad environment. Amtrak will dispatch experienced incident managers to the scene to assist the crew, provide an additional source of information about conditions as they change and identify the need for additional resources if necessary.

FACTOR: Failure of MARC management to gauge the seriousness of the situation and respond aggressively when it became apparent the situation was deteriorating

MARC management left the task of resolving the incident in the hands of the contractor, Amtrak, rather than becoming a more active participant. MARC management failed to dispatch staff to the scene in order to evaluate the situation, communicate directly with MARC management and assist in coordinating an appropriate response. Although the Amtrak-employed lead conductor has absolute jurisdiction of the train while in operation, MARC staff should have been on-site to support the train conductor and assist in the coordination of an appropriate response.

CORRECTIVE ACTION: Dispatch MTA personnel to the scene when a train is disabled and passenger comfort and convenience is at risk

MARC's past practice of monitoring incident management from the Communications Center in Baltimore is not adequate to ensure that passenger comfort and convenience is addressed. Subsequent to this incident MTA implemented a "go-team" approach in which a team of senior managers are dispatched to the scene of a disabled train or the nearest accessible location. The team is equipped with supplies for communication such as bullhorns and for passenger comfort such as water. The team assists in establishing alternative transportation and in directing passengers to their best option to reach their final destinations. The team conducted drills on each line, and has been successfully mobilized for several incidents since the "go-teams" were implemented in early July 2010. Also, as referenced later in this memo, when appropriate MTA will call on the State Highway Administration's (SHA) CHART emergency road patrols based in the Central Maryland region to respond to an incident site. This will put MDOT "eyes on the ground" as quickly as possible with CHART personnel being able to provide initial information directly to MARC management so an appropriate response can be implemented rapidly.

FACTOR: Failure of the train crew to effectively communicate with passengers throughout the duration of the incident

MTA heard many reports that the Amtrak crew failed to adequately communicate with passengers during the incident. This was confirmed by Amtrak in its follow-up investigation. This was due, in part, to an equipment failure when the batteries powering the public address system were depleted. This left the three conductors without an effective means of communicating with approximately 1,200 passengers aboard eight rail cars. No other

equipment, such as a portable bullhorn, was aboard the train to enable the crew to effectively communicate with passengers. It was also due to fact that the conductors were, at times, outside the train working to identify the reason for the failure of the brakes to release. Passengers could have also received information from MTA Transit Information Center (TIC) agents who normally staff the MARC customer information line, but the TIC closed at 7 PM and no agents were on duty.

> CORRECTIVE ACTION: Provide additional training for train crews in emergency communications procedures; extend TIC hours to cover MARC service hours.

Amtrak and MARC will identify methods to improve on-board communication when normal systems fail such as a portable public address system. MTA has already purchased and stored portable bullhorns on-board trains. Amtrak will review, update and implement emergency communications procedures that are specifically directed toward passengers. Amtrak will review with all train crews standards for content and frequency of passenger announcements.

MTA has reallocated its existing staff to extend the hours of the TIC until 11 PM on weeknights which is generally late enough to be available to answer calls from MARC passengers. Reduced staffing during peak periods has led to slight increases in on-hold times, and we are studying call patterns to provide the optimal staffing level for each time period of the day.

FACTOR: Failure of Amtrak and MARC to request assistance from local emergency responders

A single Amtrak Police Officer arrived on scene 35 minutes after the locomotive was disabled. He assisted passengers in opening doors and emergency windows. While the actions of the officer are commendable, there was a failure on the part of Amtrak Police to provide the officer with additional support when it became apparent that the situation was deteriorating. Conductors aboard the train and the Amtrak officer failed to escalate the situation to the appropriate level and request assistance of both MTA and local first responders. Ultimately, it was cell phone calls to 911 from passengers that triggered the response of emergency units from Prince George's County. MARC management also failed to request emergency assistance as the situation wore on. This was due, in part, to not having MARC staff on-site to evaluate conditions.

> CORRECTIVE ACTION: Request Amtrak to review protocols for dispatching Amtrak Police and local responders; dispatch additional Amtrak managers to the scene; dispatch MARC personnel to the scene when a train is disabled and passenger comfort and convenience is at risk; utilize other local MDOT resources

As noted above, Amtrak and MTA will dispatch experienced incident managers to the scene to assist the crew and Amtrak Police. This will provide additional personnel who can more readily realize that emergency responders are needed, and this supersedes the needs to address mechanical issues or maintain the schedules of other trains in the vicinity.

Maryland's established statewide incident command structure is now being utilized in situations involving the MARC system that rise to the level of an emergency. MTA's Chief of Police is now tasked with directly notifying the MDOT Director of Homeland Security and Emergency Management of any emergency situations involving the MARC system. The MDOT Director of Homeland Security and Emergency Management then immediately notifies the Maryland Emergency Management Agency (MEMA). MEMA assists with the coordination of an appropriate response and the allocation of any resources deemed necessary.

In the event of an incident that is some distance from the MARC Communications Center in Baltimore, MARC managers will request assistance from State Highway Administration CHART road patrol personnel who are dispatched by the Statewide Operations Center in Hanover. In some instances the SHA personnel can arrive at the scene and quickly assess the situation well before any railroad or MTA personnel can arrive.

The MARC Train 538 incident reflects a series of organizational failures at multiple levels. In the aftermath of the incident we have looked deeply and critically at our failures and those of Amtrak, and we have worked to regain the trust of our customers. As I have outlined above, and as the attached matrix containing an extensive list of corrective measures being implemented indicates, MTA and its contractor, Amtrak, have aggressively moved to address issues identified. Some corrective actions were put into place shortly after the accident and MTA imposed appropriate disciplinary action, where warranted. Other structural, training and operational issues identified, including those highlighted by the independent consultant report, will be implemented in the coming weeks and months. If you have any questions or comments regarding the documents generated as part of this review, please contact me directly.

Attachments

Report on Federal Railroad Administration De-Briefing

MARYLAND TRANSIT ADMINISTRATION
MARYLAND DEPARTMENT OF TRANSPORTATION
Martin O'Malley, Governor • Anthony G. Brown, Lt. Governor
Beverley K. Swaim-Staley, Secretary • Ralign T. Wells, Administrator

MEMORANDUM

TO: Ralign Wells
Administrator

FROM: Bernadette Bridges, Executive Director
Office of Safety, Quality Assurance and Risk Management

DATE: November 15, 2010

SUBJECT: Federal Railroad Administration CFR 239 Debriefing Report

Attached please find the document entitled " Report on The Federal Railroad Administration CFR 239 Debriefing Regarding June 21, 2010 Incident on MARC Train #538". This report was prepared by Amtrak and the Maryland Transit Administration.

If you have any questions or concerns, please contact me at 410-454-7145 or email me at Bbridges1@mta.maryland.gov or contact Phillip Thomas, MARC and Commuter Bus Safety Officer at 410-454-7142 or email him at PThomas@mta.maryland.gov.

Attachment

cc: Mr. Larry Beard, Amtrak
Mr. Henry Kay, Deputy Administrator for Planning and Engineering, MTA
Mr. Simon Taylor, Chief of Staff, MTA
Mr. Phillip Thomas, MARC and Commuter Bus Safety Officer, MTA

REPORT ON

THE FEDERAL RAILROAD ADMINISTRATION

CFR 239 DEBRIEFING

REGARDING

JUNE 21, 2010 INCIDENT ON MARC TRAIN #538

PREPARED BY

AMTRAK

&

MARYLAND TRANSIT ADMINISTRATION

ISSUED NOVEMBER 15, 2010

PURPOSE OF REPORT

On June 21, 2010, MARC Train 538 was disabled and eventually evacuated. According to the Code of Federal Regulations, Title 49, Part 239 (CFR 239), in an event in which passengers are evacuated from a train the railroad must investigate and hold a de-briefing on the incident. Accordingly, safety officers for both the train operator, the National Passenger Railroad Corporation (Amtrak) and the contractor for the service, the Maryland Transit Administration (MTA), investigated the incident and conducted a de-briefing on August 18, 2010. Attendees included representatives from Amtrak, MTA, Maryland Department of Transportation, the Federal Railroad Administration (FRA), and local emergency response agencies who responded to the scene. The following report summarizes the incident, findings of the investigation, and recommended actions to improve responses to future incidents of this nature. Worksheets utilized in the preparation of this report are included.

SUMMARY OF THE INCIDENT

On June 21, 2010 MARC Train No. 538 departed Washington Union Station at 6:13 pm for Perryville, Maryland and intermediate stops. There were approximately 1,200 passengers on board and a crew consisting of a conductor, two assistant conductors and an engineer. The outside ambient temperature was approximately 90 degrees Fahrenheit. The train consisted of seven bi-level passenger coaches and one single-level passenger coach/cab car, propelled by a HHP-8 electric locomotive.

At 6:20 p.m. the Train Engineer reported to Amtrak's Centralized Electrification and Traffic Control Center (CETC) that the main circuit breaker was open and the train was stopped in the vicinity of Landover, Maryland and unable to move.

At 6:23 p.m. MTA's MARC Operations Center was notified by Amtrak Washington Commuter Operations that Train No. 538 was stopped, that the main circuit breaker was open and that the electric locomotive was without Head End Power (HEP) leaving the passenger coaches without air conditioning. The train was equipped with a battery backup system that powers the public address system and the train emergency lighting. While initial reports indicated that the train was in an inaccessible location, MTA learned later that the south end of train was immediately adjacent to U.S. 50 and was in fact accessible.

Within 30 minutes of the loss of air conditioning the ambient interior temperature rose to an uncomfortable level. Passengers reported that the temperature was more than 100 degrees Fahrenheit, although this is unverified. Passengers reported that the crew instructed passengers not to remove windows, open doors or stand in the vestibules for safety reasons. The crew opened end doors to provide ventilation.

At 6:53 p.m. an Amtrak foreman arrived on northbound MARC Train 440. The foreman was unable to re-start the locomotive.

At 6:59 p.m. MTA sent an emergency notification to key MTA personnel indicating that Train 538 was stopped south of the New Carrollton Station. Subsequent updates stated that a rescue locomotive was en-route, and delays in train service on the Penn Line of 75-90 minutes out of Washington were expected.

At 7:00 p.m. Amtrak dispatched a diesel locomotive from Union Station with the intent of coupling it to the disabled train to pull it back to Washington Union Station. The locomotive arrived on the scene at 7:17 p.m. The coupling succeeded initially however the crew was unable to release the brakes on the disabled train. Crew members attempted to identify the source of the problem with the brakes.

At 7:02 p.m., an Amtrak police officer arrived on the scene. The officer assisted the passengers in opening additional doors and removing emergency windows on the train. Passengers placed 911 calls which were received by the Prince George's County Dispatch Center. Passengers stated there were medical emergencies on the train due to the heat.

At 7:45 p.m. an additional Amtrak foreman who was riding a different MARC motor in a technical capacity, arrived on southbound Acela 2165.

As the delay continued, it became increasingly difficult for the MARC crew and Amtrak Police Officer to maintain crowd control. At 7:48 p.m. passengers began self-evacuating the train. At an undetermined time the battery back-up system was depleted which severely constrained the crew's ability to make public address announcements to the passengers.

At 7:50 p.m. passengers who had self-evacuated were instructed by the crew to remain in a near-by location, off of the railroad right-of-way, but the crew was unable to enforce this order.

Shortly before 8:00 p.m., Maryland State Police and Prince George's County Emergency Management Services (EMS) personnel arrived on the scene and were briefed on the incident by the Amtrak Police Officer. EMS personnel began removing from the train passengers requiring medical attention and then ordered an evacuation of the train.

At approximately 8:15 p.m. Amtrak CETC stopped northbound MARC Train No. 442 with the intent of boarding the evacuated passengers. Approximately 1,100 passengers transferred to Train 442, which departed at 8:51 p.m. Approximately 100 passengers could not be accommodated on Train 442 and remained with Train 538.

At 8:15 p.m. Amtrak foremen were able to restore head-end power on locomotive 4911 thereby restoring air conditioning and other power on Train 538.

At 9:18 p.m. Amtrak foremen were able to get locomotive 4911 up and running, and Train 538 was able to move north to New Carrollton Station. The remaining 100 passengers were discharged at New Carrollton and then boarded MARC Train 544. Train 538 returned to Union Station, arriving at 10:00 p.m.

FINDINGS AND RECOMMENDATIONS

Maintenance

Findings:

Existing procedures and tools for diagnosing and repairing electric locomotives need to be reviewed and potentially updated and personnel retrained in the most up to date methods. As a preemptive measure, train technicians would ride some of the MARC and

Amtrak trains operated with electric locomotives to be on hand should an equipment failure occur.

Recommendations:

1.0 Review history of locomotive during preventative maintenance inspections to ensure there are no systemic problems that could cause reoccurring failures.

2.0 Ensure the diagnostic/repair laptops contain the most recent software, and technicians training is up-to-date, to enable them to reset the electric locomotives. Also, review the locomotive reset process to determine if modifications are required.

3.0 Review, reissue and train on Head End Power (HEP) Power Failure Procedures listed in the Emergency Preparedness section of the Amtrak Service Standards Manual.

4.0 Retrain locomotive engineers on electric locomotive troubleshooting procedures.

5.0 Ensure MARC AEM-7 and HHP8 locomotives have their MAP 100s, MAP 9, and MEAPS (HHP only) reviewed after each trip.

6.0 During daily layover maintenance at all major operating terminals, ensure the electric locomotives have the radiators washed and all body filters inspected and changed as appropriate.

7.0 Select trains will have technicians and experienced personnel on board as a precaution in case of in-route equipment problems.

Communication and Incident Management

Findings:

Improvement is needed in the areas of customer communication, incident management and meeting the basic needs of riders. Communication with riders on board a disabled train as well as with other riders impacted by the subsequent delays is crucial. For the riders' safety, MARC and Amtrak crews and staff need to fully understand and be able to successfully implement incident management practices. Basic needs of the riders, such as drinking water and access to fresh air, need to be met.

Recommendations

8.0 Place potable water on all MARC trains, Amtrak Police vehicles and any Amtrak or MTA vehicle that could respond to an incident.

9.0 Identify methods to improve on-board communications when normal systems fail such as a portable public address system.

10.0 Review, update and implement emergency procedures to ensure communication between crew members and passengers is maintained.

11.0 Conduct training for train crews on Incident Command System (ICS) procedures in the passenger railroad environment.

12.0 Review with train crews all announcements relating to emergencies on-board trains.

13.0 Train MARC Communications Center and Management staff on MTA/MARC, Amtrak, CSXT Passenger Safety Train Emergency Preparedness plans.

14.0 Require all MARC management, trainmasters, mechanical and supervisory personnel complete National Incident Management System (NIMS) ICS training.

15.0 Update, reissue and train on MTA/MARC Continuity of Operations Plan and Emergency Preparedness Operations plans for all MARC personnel.

16.0 Update, reissue and train on MARC Response and Evacuation Plan for all MARC crews, management, trainmasters, mechanical and supervisory personnel.

17.0 Review, update and train appropriate MTA/MARC personnel on procedures for transmitting emergency pages and Passenger Information Email.

18.0 Review, update and train MTA/MARC and Amtrak personnel on procedures for responding to a disabled train with particular focus on commuter rail traffic during rush hour.

19.0 MTA/MARC and Amtrak management respond to incident locations as soon as possible.

Service Reliability

Findings:

The investigation helped focus attention on the need to improve daily service reliability and response time of rescue trains, and to reinforce procedures in place to put passengers first.

Recommendations

20.0 Ensure Amtrak closely monitors train on-time performance and reliability of poorest performing Penn Line trains caused by scheduling or mechanical difficulties, including but not limited to, annulling regularly scheduled trains to provide sufficient capacity to rescue a train in distress.

21.0 Ensure rescue trains and equipment are positioned to respond quickly to disabled trains.

22.0 Modify operating practices by running larger MARC trainsets with two diesel locomotives where practicable.

DEBRIEFING/CRITIQUE	
Title of Plan/Procedure Activated: MARC 538 Loss of Power	
Date of Activity: June 21, 2010	**Location of Activity**: MP 130.8/PW Line
Type of Activity: Actual	
Units/Departments Participating: Operations (Transportation, Mechanical, Engineering,	
Customer Services, Washington Commuter District), APD, Prince Georges County, MD	
Fire, EMS, Police	
Scenario of Events: See Attachment #1	
Were the objectives of the plan/procedure completed? No	
List what you learned during the exercise:	
1. Additional training on Incident Command System procedures.	
2. Review & retraining of employees on severe weather procedures.	
3. Review, revising, and training on Engine Start Procedures for HHP locomotives.	
4. Mechanical requirements for diagnosing problems and resolving them on electric motors.	
List any unresolved issues:	
1. Who is in charge of railroad incidents?	
2. Communication protocols for conductor to crew; conductor to passengers; crew to	
Dispatchers; control centers to responders.	
List things that did not go well:	
1. Command and Control of the Incident.	
2. Communication between all agencies involved and with the public.	
3. Following of established procedures.	
List things that went well:	
1. Aggressiveness of the APD responding officer at the scene.	
2. Passenger egress to track bed and to rescue train.	
List manpower, fiscal or other resource constraints:	
1. Not enough personnel to control the number of passengers.	
2. No management at the scene.	
3. Availability of rescue trains.	
Could you have executed the plan with less manpower? No	
If critique is for a drill, was the exercise useful? N/A	

NIMS (National Incident Management System) Compliance
Command and Management:
Was the activity conducted utilizing the following?
Incident Command System - No
Multi-agency Coordination System - No
Public Information Systems - Yes. The MTA Passenger Alert System
Preparedness: Prior to the exercise, drill, or incident was sufficient planning and training
conducted? Yes. County responders had received PTER Training within the six
months prior.
Adequate personnel qualified and certification standards met? No.
Was proper equipment, that meets certification standards, utilized? Yes
Were Mutual Aid Agreements and Emergency Management Assistance Compacts completed? Yes. County used various local jurisdictions to respond to the event.
Resource Management:
Were there defined standardized mechanisms and requirements for inventorying, mobilizing, dispatching, tracking, and recovering resources over the cycle of the exercise, drill, or incident? Yes
Communications and Information Management:
Did a standardized framework for communications, information management, and information sharing support all levels of incident management? Yes.
1. The MTA Passenger Alert Network was utilized.
2. Amtrak and MTA/MARC Emergency Notification systems were used.
Supporting Technologies:
Did technology and technological systems provide adequate supporting capabilities? Yes
Voice and data communication systems-Amtrak &MTA/MARC Emergency Notification systems
Information Management Systems such as recordkeeping and resource tracking-Yes
Data display systems-Yes
49 CFR, Part 239 Questions
Did on board communications function properly?
Reported that PA's quit after approximately 30 minutes.
Time Elapsed between start of event and notification of responders?
1+29 from start of event until first dispatch. No formal notification was made.
Did Control Centers promptly initiate required notifications?
No. Service Standards Manual, Section One, HEP Failure Procedures not followed.
How efficiently did responders respond?
Followed procedures taught to them by Amtrak Emergency Preparedness.
No crowd control at the incident.
How efficiently did responders exit the equipment?
Self evacuated. It was not a controlled evacuation. Crowd control was a problem.
Name of Preparer: Larry Beard/Amtrak & Phil Thomas/MTA
Telephone Number [redacted]

RECOMMENDATIONS

Recommended Action: Develop emergency procedures and provide equipment to ensure that Communications between crew members and passengers is maintained.

1. Immediately brief all T & E crews in MARC service on proper on-board communications.
2. Develop specific training on customer communications during incidents to be incorporated into 2011 Block Training module.
3. Investigate use of alternative communications tools for use by on-board crews use when on board battery systems are depleted.
4. Investigate use of alternative communications tools for use by on-board crews use when passengers have self evacuated to the right-of-way.
5. Brief Commuter Operations Center and CETC personnel on requirements to Provide information on response plan, to on-board crews during incidents.
6. Program MARC Conductor, company issued cell phones, to receive service disruption updates from CNOC/RCMS system.

Area of Action: Operations-Mechanical, Transportation

Training: For T & E Crews and all OBS employees.

In-service: Yes

Vendor provided: No

Human Resources provided: No

Capital Project: No

Procedural/Plan Change or Revision: Yes.

1. Document briefings in TDRS under test number 624, with comment- "Briefed on emergency, security, safety and delay announcements".
2. Incorporate into 2011 Block Training Module
3. Incorporate changes to procedures if an alternative is selected.
4. Incorporate changes to procedures if an alternative is selected.
5. No changes required.
6. Add updates to company issued cell phones.

Responsible Person and Office:

1. [redacted] Superintendent, Terminal and Commuter Operations.
2. [redacted] Chief Transportation Officer
3. [redacted] MARC Mechanical Officer
4. [redacted]
5. [redacted] Asst. Superintendent, Train Movement
6. [redacted] Assistant Superintendent, Washington Commuter District

[redacted] Director, System Operations

Date Assigned for Action:
1. August 18, 2010
2. August 18, 2010
3. August 18, 2010
4. August 18, 2010

	5. August 18, 2010
	6. August 18, 2010
Expected Completion Date:	1. August 27, 2010 (Completed August 27, 2010)
	2. November 30, 2010
	3. ~~August 31, 2010~~December 31, 2010-Due to a coordinated evaluation process between Amtrak & MARC.
	4. ~~August 31, 2010~~December 31, 2010-Due to a coordinated evaluation process between Amtrak & MARC.
	5. August 31, 2020 (Completed-Commuter Ops-Aug. 23 Completed-CETC-Aug. 27, 2010)
	6. August 31, 2010 (Completed August 24, 2010)

RECOMMENDATIONS-

Recommended Action:	Install laptop computers, with current software, to reset vital components on all electric motors, to include AEM-7's and HHP's for AMTRAK and MARC.
Area of Action:	AMTRAK Operations-Mechanical, Transportation; MARC-Mechanical
Training:	Yes
In-service:	Yes
Vendor provided:	Yes
Human Resources provided:	No
Capital Project:	Yes. To purchase equipment and training.
Procedural/Plan Change or Revision:	Yes. For operating the computer
Responsible Person and Office:	
1. [redacted]	DCMO Engineering
2. [redacted]	Chief Transportation Officer
3. MARC Chief Mechanical Officer	
Date Assigned for Action:	August 18, 2010
Expected Completion Date:	December 31, 2010-project definition/Completion based upon definition.

RECOMMENDATIONS

Recommended Action: Review, reissue, and train on HEP Power Failure Procedures that are listed in the Amtrak Service Standards Manual, Emergency Preparedness Section.

Area of Action: Operations-Transportation (Management, T & E Crews, Control areas),

Training: For T & E Crews, CETC Managers & Controllers, CNOC Train Operations, all Transportation Management, Customer Services Management and all OBS employees.

Add an additional day to Block Training for Emergency Preparedness Training.

In-service: Yes

Vendor provided: No

Human Resources provided: No

Capital Project: No

Procedural/Plan Change or Revision: None at this time, but maybe after review.

Responsible Person and Office:

1. [redacted] Chief Transportation Officer.
2. [redacted] Senior Director OBS & Station Standards

Date Assigned for Action: August 18, 2010

Expected Completion Date: December 31, 2010

RECOMMENDATIONS

Recommended Action: Review, reissue and train on System General Road Foreman Notice #2010-29, Electric Locomotive, HHP Locomotive

Area of Action: Operations-Transportation, Mechanical

Training: Yes

In-service: Yes

Vendor provided: No

Human Resources provided: No

Capital Project: No

Procedural/Plan Change or Revision: After review, if necessary

Responsible Person and Office:

1. [redacted] Chief Transportation Officer
2. [redacted] Deputy Chief Mechanical Officer

Date Assigned for Action: August 1, 2010

Expected Completion Date: December 1, 2010

RECOMMENDATIONS

Recommended Action: Training on ICS Procedures in the passenger railroad environment

Area of Action: Operations-Transportation (Management, T & E Crews, Control areas, Customer Service); APD (all areas)

Training: For T & E Crews, CETC Managers & Controllers, CNOC Train Operations, all Operations Management; APD (Management, Officers, NCC) Add an additional day to Block Training for Emergency Preparedness Training. Teach additional classes, as necessary.

In-service: Yes

Vendor provided: No

Human Resources provided: No

Capital Project: No

Procedural/Plan Change or Revision: None. Use the Emergency Preparedness developed ICS in the Passenger Rail Environment training program.

Responsible Person and Office:

1. [redacted] General Manager, East
2. [redacted] Deputy Chief Operations Support
3. [redacted] Senior Director, Emergency Preparedness

Date Assigned for Action: August 18, 2010

Expected Completion Date: December 31, 2010

RECOMMENDATIONS

Recommended Action: Review, with all Train Crew Employees, all announcements relating to emergencies on-board trains.

Area of Action: Operations-Transportation

Training: Yes

In-service: Yes

Vendor provided: No

Human Resources provided: No

Capital Project: No

Procedural/Plan Change or Revision: None

Responsible Person and Office:

1. [redacted] General Superintendent, Mid-Atlantic Division

Date Assigned for Action: 25 June 2010

Expected Completion Date: 1 October 2010

RECOMMENDATIONS
Recommended Action: MARC personnel (all Operations Center, and all MARC Management staff) to train on MTA/MARC, Amtrak, CSXT Passenger Train Emergency Preparedness Plan.
Area of Action: Operations-Mechanical, Transportation
Training: Yes
In-service: Yes
Vendor provided: No
Human Resources provided: No
Capital Project: No
Procedural/Plan Change or Revision: No
Responsible Person and Office:
[redacted] MTA Office of Training and Development
Date Assigned for Action: September 7, 2010
Expected Completion Date: October 31, 2010

RECOMMENDATIONS
Recommended Action: All MARC management, trainmasters, mechanical and supervisor personnel to complete National Incident Management System (NIMS ICS) training.
Area of Action: All MARC management, trainmasters, mechanical and supervisors personal
Training: Yes
In-service: Yes
Vendor provided: No
Human Resources provided: Yes
Capital Project: No
Procedural/Plan Change or Revision: No
Responsible Person and Office:
[redacted] MTA Office of Training and Development
Date Assigned for Action: September 7, 2010
Expected Completion Date: January 31, 2011

RECOMMENDATIONS
Recommended Action: Update and Training all MARC personnel on MTA/MARC Continuity Of Operations Plan & Emergency Preparedness Operations Plan.
Area of Action: All MARC Personal
Training: Yes
In-service: Yes
Vendor provided: No
Human Resources provided: No
Capital Project: No
Procedural/Plan Change or Revision: No
Responsible Person and Office:
[redacted] Director, MARC
Date Assigned for Action: August 1, 2010
Expected Completion Date: September 30, 2010

RECOMMENDATIONS
Recommended Action: Update, reissue, and train on the MARC Response & Evacuation Plan.
Area of Action: All MARC management.
Training: Yes
In-service: Yes
Vendor provided: Yes
Human Resources provided: Yes
Capital Project: No
Procedural/Plan Change or Revision: No
Responsible Person and Office:
[redacted] MTA Office of Safety
Date Assigned for Action: September 7, 2010
Expected Completion Date: February 18, 2011

RECOMMENDATIONS

Recommended Action: Review, and retrain appropriate MTA/MARC Procedures for transmitting emergency pages and MTA/MARC Passenger Information Email. Program MARC Conductor, company issued cell phones, to receive service disruption updates from MTA alert notification system.

Area of Action: MTA/MARC Operations

Training: For T & E Crews, CETC Managers & Controllers, CNOC Train Operations, all Operations Management; APD (Management, Officers, NCC).

In-service: Yes

Vendor provided: No

Human Resources provided: No

Capital Project: No

Procedural/Plan Change or Revision: Possibly after the review.

Responsible Person and Office:

1. [redacted] Director, MARC
2. [redacted]

Date Assigned for Action: August 1, 2010

Expected Completion Date: September 30, 2010 (Completed August 27, 2010)

RECOMMENDATIONS

Recommended Action: Develop and train on procedures for responding to a disabled train. Paying particular attention to commuter rail traffic during rush hour.

Area of Action: Operations-Transportation

Training: Yes

In-service: Yes

Vendor provided: No

Human Resources provided: No

Capital Project: No

Procedural/Plan Change or Revision: Yes. Procedures must be developed, validated, and affected employees trained on them.

Responsible Person and Office:

1. Division Superintendants of Operation (for their specific Division)
2. Commuter Agency Operations that Amtrak operates, or controls.

Date Assigned for Action: August 18, 2010

Expected Completion Date: December 31, 2010

RECOMMENDATIONS

Recommended Action: Management respond to incident locations as soon as available.
Area of Action: Operations-Transportation, Mechanical
Training:
In-service: Not required
Vendor provided: No
Human Resources provided: No
Capital Project: No
Procedural/Plan Change or Revision: Yes. Issue directive to all Transportation and Mechanical supervision that they will deploy a manager to all passenger rail incidents as soon as they become aware of the incident.
Responsible Person and Office:
1. [redacted] General Manager, East
2. [redacted] Chief Mechanical Officer

Date Assigned for Action: August 18, 2010
Expected Completion Date: December 31, 2010

RECOMMENDATIONS

Recommended Action: Ensure that sufficient water is available on-board all passenger trains, and in responding company vehicles (staff, APD), during warm weather months.
Area of Action: Operations-Mechanical/Transportation; APD
Training: No
In-service: No
Vendor provided: No
Human Resources provided: No
Capital Project: No
Procedural/Plan Change or Revision: Yes. Procedures must be developed, validated, and affected employees trained on them.
Responsible Person and Office:
1. [redacted] Deputy Chief Mechanical Officer
2. [redacted] General Manager, East
3. [redacted] Deputy Chief Operations Support

Date Assigned for Action: August 18, 2010
Expected Completion Date: August 31, 2010 (Complete for APD-30 August 2010)

RECOMMENDATIONS

Recommended Action: All HHP AC locomotive Radiator fan and Traction Motor blowers switched to high operating speed in order to introduce a greater volume of cooler exterior ambient air into the warmer engine room compartment. This change will remain in effect during these extreme operating conditions. Once the ambient air returns to more seasonal levels the locomotives will be restored to their normal operating mode.

Area of Action: Mechanical

Training: No

In-service: No

Vendor provided: No

Human Resources provided: No

Capital Project: No

Procedural/Plan Change or Revision: Notice to all locations maintaining/servicing AEM-7's.

Responsible Person and Office: [redacted] Deputy, Mechanical Officer

Date Assigned for Action: June 22, 2010

Expected Completion Date: Complete-August 18, 2010

RECOMMENDATIONS

Recommended Action: During daily layover maintenance at all major operating terminals, the electric locomotives have the radiators washed and all body filters inspected and changed as appropriate.

Area of Action: Mechanical

Training: No

In-service: No

Vendor provided: No

Human Resources provided: No

Capital Project: No

Procedural/Plan Change or Revision: Yes. Notice to all locations maintaining/servicing electric locomotives

Responsible Person and Office: [redacted] Deputy Chief Mechanical Officer

Date Assigned for Action: 22 June 2010

Expected Completion Date: Complete 18 August 2010

RECOMMENDATIONS

Recommended Action: Selected trains, including MARC, will have technicians and experienced personnel on board as a precaution against any enroute equipment issues and concerns. This practice will occur during periods of extreme operating conditions.

Area of Action: Mechanical

Training: No

In-service: No

Vendor provided: No

Human Resources provided: No

Capital Project: No

Procedural/Plan Change or Revision: Notice to all areas maintaining/servicing trains.

Responsible Person and Office: [redacted] Deputy, Mechanical Officer

Date Assigned for Action: July 1, 2010

Expected Completion Date: Complete August 18, 2010

RECOMMENDATIONS

Recommended Action: Position "protect" equipment strategically up and down the NEC with support sufficient personnel as a precaution against operational anomalies.

Area of Action: Operations-Transportation, Mechanical

Training: No

In-service: No

Vendor provided: No

Human Resources provided: No

Capital Project: No

Procedural/Plan Change or Revision: Yes. Directive from Transportation and Mechanical

Responsible Person and Office:

1. Master Mechanics at each NEC Division
2. General Superintendants at each NEC Division

Date Assigned for Action: June 22, 2010

Expected Completion Date: Complete but an on-going process. August 18, 2010

RECOMMENDATIONS

Recommended Action: Check for proper functionality HVAC and Head End Power (HEP) systems on all passenger car fleets

Area of Action: Mechanical

Training: No

In-service: No

Vendor provided: No

Human Resources provided: No

Capital Project: No

Procedural/Plan Change or Revision:

Responsible Person and Office: [redacted] Deputy, Mechanical Officer

Date Assigned for Action: August 18, 2010

Expected Completion Date: Ongoing during daily and preventative maintenance inspections.

RECOMMENDATIONS

Recommended Action: Restrict, as much as possible, HHP Locomotives operating trains with eight cars to avoid placing too much stress on major system component such as HEP machine Group. Nine car sets operate with diesel power.

Area of Action: Operations-Mechanical, Transportation

Training: No

In-service: No

Vendor provided: No

Human Resources provided: No

Capital Project: No

Procedural/Plan Change or Revision: Yes. Directive from Transportation and Mechanical

Responsible Person and Office:

1. Master Mechanics at each NEC Division
2. Superintendant of Operations of each NEC Division

Date Assigned for Action: August 18, 2010

Expected Completion Date: Ongoing based upon equipment availability.

RECOMMENDATIONS

Recommended Action: Remove chronic, locomotive, performers from service and perform System/Component checks, repairing those items that are found to be substandard.

Area of Action: Mechanical

Training: No

In-service: No

Vendor provided: No

Human Resources provided: No

Capital Project: No

Procedural/Plan Change or Revision:

Responsible Person and Office:

[redacted] Deputy, Mechanical Officer/Electric Locomotive RBA Team

Date Assigned for Action: 22 June 2010

Expected Completion Date: Standard practice that is on-going.

RECOMMENDATIONS

Recommended Action: Train all MARC personnel on MTA/MARC System Safety Program Plan (SSPP).

Area of Action: All MARC management

Training: For all MARC Personnel

In-service: Yes

Vendor provided: No

Human Resources provided: No

Capital Project: No

Procedural/Plan Change or Revision: No

Responsible Person and Office: [redacted] MTA Office of Safety

Date Assigned for Action: 7 September 2010

Expected Completion Date: 31 October 2010

RECOMMENDATIONS
Recommended Action: Ensure all employees have access to and complete basic NIMS training (ICS 100) and other levels, depending on job function.
Area of Action: All Amtrak Departments. Operations (Emergency Preparedness Group)to facilitate the startup of development.
Training: All Amtrak Employees
In-service: TBD
Vendor provided: TBD
Human Resources provided: TBD
Capital Project: TBD
Procedural/Plan Change or Revision: To be developed.
Responsible Person and Office: [redacted] Amtrak Police Department
Date Assigned for Action: August 31, 2010
Expected Completion Date: December 31, 2013

Evaluation of MARC Operations and Procedures by Independent Consultant

MARC COMMUNICATIONS & EMERGENCY PROCEDURES REVIEW

MARC TRAIN 538 INCIDENT ON JUNE 21, 2010

PREPARED BY:

Booz | Allen | Hamilton

FOR THE MARYLAND TRANSIT ADMINISTRATION
NOVEMBER 30, 2010

INTRODUCTION

This summary provides an overview of work conducted with, and on behalf of the Maryland Transit Administration (MTA) in assessing the emergency response and customer communications associated with the MARC train number 538 incident that occurred on June 21, 2010. As a result of the communications and response issues identified by MTA, a team of experts were assembled to interview key staff involved in the incident, evaluate the response plans of other peer commuter rail agencies and to conduct a Roundtable panel review of the incident with peer agency representatives. The overall goal of this task was to identify a prioritized set of recommended actions that MTA could take to improve response and communications for future MARC-related service events.

This document includes a summary of the June 21 incident, industry best practices, interview findings, Roundtable Peer Review findings and a resulting consolidated set of prioritized recommendations. The document was compiled by an Assessment Team led by Pete Cannito, former President of Metro North Rail and former Vice President of Engineering at Amtrak, and John Agro, former MTA Administrator.

INCIDENT BACKGROUND

On June 21, 2010, MARC train number 538 departed Union Station and traveled northbound on the Penn Line toward Perryville, Maryland with approximately 900– 1200 passengers aboard the eight-car train. Shortly after departure the train became disabled near the New Carrolton Station. The locomotive engineer notified the Amtrak control tower, Centralized Electrification and Traffic Control (CETC), which dispatched a rescue locomotive from Amtrak's maintenance facility in Washington, D.C. to the scene of the disabled train with the intention of pulling the disabled train back to Union Station. The attempt to return MARC train 538 to the station failed, and numerous secondary attempts to get the train moving again also failed. Passengers on the disabled train were not immediately evacuated and remained on-board the train in excessive heat conditions. The train was without air conditioning or water for passenger hydration. Communications between the train crew and the passengers was erratic with long periods of time between updates. Due to the extended delays, excessive heat and lack of communications, some passengers removed windows or self-evacuated. Passengers were eventually moved to passing train number 422 and the remaining passengers were detrained at the New Carrollton station for boarding onto train 544—all occurring approximately three hours after the incident began.

What should have been a routine maintenance-related procedure or train recovery operation escalated into an emergency situation and exposed fractured processes for passenger communications, emergency management and train evacuation. The actions taken by Amtrak and MARC personnel during this incident were primarily focused on solving the mechanical

situation. Additional resources and attention should have also been focused on providing necessary emergency communications to passengers and ensuring their comfort and safety on-board the train.

CHRONOLOGY OF KEY EVENTS ON JUNE 21, 2010

The following chronology of events is related to the Train 538 incident and is based on the timelines contained within the Code of Federal Regulations (CFR) 239 Debrief information:

- **6:13 p.m.** MARC Train 538 departs Washington Union Station.
- **6:20 p.m.** Train 538 Engineer tells Centralized Electrification and Traffic Control (CETC) that MARC Train 538 is stopped.
- **6:30 p.m.** Train 538 Engineer is unable to restart the train.
- **6:35 p.m.** Mid Atlantic Commuter Control Center calls K Tower (a dispatch control center in Washington, D.C. responsible for train dispatch up until New York Avenue) for a road-qualified engineer to take a diesel engine to MARC Train 538.
- **6:40 p.m.** K Tower representative informs the Mid Atlantic Commuter Control Center that an engine is being prepared for dispatch to the incident site.
- **7:17 p.m.** Amtrak rescue engine arrives in proximity to the incident and is waiting on the Conductor of MARC train 538.
- **7:30 p.m.** Amtrak rescue engine is coupled to the rear of train 538.
- **7:40 p.m.** Train 538 Engineer tells the Amtrak rescue engine that the parking brake cannot be released.
- **7:45 p.m.** Amtrak personnel arrive with diagnostic laptop.
- **7:55 p.m.** MARC train 538 staff tell CETC that the parking brake is now released.
- **8:15 p.m.** On-site Amtrak personnel calls Commuter Operations and says that train 538 engine is up and running. Passengers are reported to be off of the train and the Amtrak Police, as well as other emergency responders, are also on the scene.
- **8:15 p.m.** Train 442 arrives next to train 538 to transfer passengers. There are still 100 remaining passengers on train 538.
- **8:51 p.m.** Train 442 departs.
- **9:18 p.m.** Train 538 moves north to New Carrollton Station to detrain the remaining passengers onto train 544.
- **9:43 p.m.** Train 538 moves south to Washington Union Station.
- **10 p.m.** Train 538 arrives back at Union Station.

SCOPE/METHODOLOGY OF ASSESSMENT

Due to MARC's critical role in transporting approximately 34,000 passengers daily between West Virginia, Perryville, Baltimore and Washington, D.C. locations, MARC's ability to manage incidents and emergencies across a broad geography with multiple stakeholders is imperative. The MTA contracts MARC's Penn Line operational services to Amtrak, including train crews, training of crews, maintenance and storage of train equipment, and control and dispatching of trains (Camden and Brunswick lines operations and maintenance are contracted to CSX).

The Assessment Team was requested to focus on MARC's incident response performance and identify best practices and recommendations that could help MARC better manage future passenger-related incidents. The team's review did not address Amtrak's ability to perform its functions in terms of maintenance or response. The review of Amtrak's performance was conducted separately as part of the Code of Federal Regulations (CFR) 239 investigation.

Specifically, the Assessment Team was tasked by the MTA to examine MTA's/ MARC's ability to respond and successfully manage an incident prior to it escalating into an emergency. Based on the Assessment Team's scope, multiple separate tasks were completed including: conducting interviews with key staff members from MTA, MDOT, the American Public Transportation Association (APTA) and Amtrak; collecting and reviewing MTA/ MARC and Amtrak procedures and policies for incident response; identifying industry best practices through a review of passenger train emergency preparedness plans and determining gaps between industry standards and existing MTA/ MARC practices; and facilitating a one-day Roundtable Peer Review session in which industry experts from other transit agencies provided their recommendations for improving MTA's/ MARC's incident and emergency response.

The team used the employee inputs, including information provided during the CFR 239 Review conducted on August 18, 2010, to develop suggested recommendations that MTA could implement to improve organizational response to emergency situations. The Assessment Team developed a preliminary findings document that was used as a basis for the Roundtable Peer Review discussion convened on October 29, 2010. The one-day session included the participation of peer industry experts and MTA employees. The details from that session were included in the final recommendations.

ASSESSMENT TEAM REPORT OVERVIEW

The Assessment Team report is divided into the following sections: Overview of Interviews; Best Practices Summary; Roundtable Peer Review Overview, Interview and Roundtable Findings; and Recommendations.

ASSESSMENT TEAM REPORT: OVERVIEW OF INTERVIEWS

The team compiled background, findings and recommendations from interviews with 25 stakeholders from MDOT, the MTA, Amtrak and APTA.

Interviewees included:

- MTA Administrator
- Amtrak Mid Atlantic Safety Manager and Terminal Superintendent
- Director of MARC Train and Commuter Bus Service
- Vice President of Member Services from the American Public Transportation Association MDOT's Director of Homeland Security and Emergency Management
- MARC trainmasters
- MTA communications representatives and
- MTA and Amtrak safety personnel

ASSESSMENT TEAM REPORT: COMMUTER RAIL EMERGENCY MANAGEMENT PLANS' BEST PRACTICES SUMMARY

The Assessment Team reviewed incident and emergency response plans from seven transit/railroad agencies: MTA/ MARC; Virginia Railway Express (VRE); Utah Transit Authority (UTA); Southern California Regional Railway Authority (SCRRA); South Florida Regional Transit Authority (SFRTA); Amtrak; and CSX. The assessment included an identification of the common key actions and activities undertaken by other peer commuter railroads to ensure improved emergency communications and response. The following are common themes among transit agency plans evaluated:

- Roles and responsibilities required of each staff member who would partake in managing an incident or emergency are clearly defined and focused.
- Sound agency communications processes are in place for proactive and efficient information-sharing and coordination with first responders and public information officers.
- Regular reviews and updates are made at least annually (if necessary) to emergency management plans, standard operating procedures, and emergency operations plans.

- Regular training in emergency management and response for all necessary employees is provided and is integrated into new employee orientations.
- Disruptions are classified based on levels of severity and corresponding notification procedures are developed to inform the appropriate stakeholders who are to be informed or respond to the incident based on their assigned classification level.
- Frequent emergency training exercises are collaboratively scheduled with transit agencies and local emergency responders.

In addition to reviewing the response plans, the Assessment Team also reviewed APTA's best practices guide complied from the APTA Standards Development Program, developed by the APTA Security Emergency Management Work Group. The purpose of the guide is to assist transit agencies in developing an emergency management plan that follows Federal Emergency Management Agency (FEMA) Comprehensive Planning Guide 101 format and encompasses hazard, function and regulation-specific annexes. When comparing MTA's/MARC's Response and Evacuation Plan to APTA's best practices, the comparison validated that only one best practice is currently included in the MARC plan and all of MTA's response plans need to be developed or updated to include the best practices listed below.

APTA Recommended Best Practices

- Develop public warning statements for media distribution.
- Administer written competency tests and training drills to ensure employees are qualified and able to perform emergency responsibilities.
- Establish a multi-agency review committee to meet at least quarterly.
- Complete a plan review and exercises at least annually.
- Include response and evacuation training in orientation—with more traditional training venues—when procedures are extensively revised and employees change their area of responsibility. *(This best practice is currently included in the MARC Response and Evacuation Plan).*
- Provide dispatchers with SSPP, 49 CFR part 239, Emergency Preparedness Plan, and Contract Operator Emergency Response Plan training.
- Update training for current employees at least every two years.
- Conduct a regular "gap analysis" to evaluate existing agency documents and plans that relate to safety, security, and emergency preparedness.

Note: during the Peer Review session, MTA/ MARC staff explained they have already started incorporating many of the APTA best practices into their policies and procedures since the incident on June 21.

ASSESSMENT TEAM REPORT: PEER REVIEW ROUNDTABLE OVERVIEW

On October 29, 2010 the Roundtable Peer Review was held as a one-day session initiated by the MTA to solicit feedback on the Assessment Team's findings and recommendations, to gather suggestions to improve MTA's processes, and to understand industry best practices in crisis management based on the experiences of peer transit agency professionals. Twenty-seven participants attended the review which included MARC/MTA executive staff, management staff and the peer review panel.

The Peer Review panel included:

- David Solow (former CEO of Southern California Regional Rail Authority);
- Frederick Wedley (former General Manager of Station Operations, Long Island Rail Road);
- Mark Campbell (former Chief Safety and Security Officer at Metro North Commuter Railroad Company);
- Anna Barry, Senior Director, Vehicle Procurement and Quality Assurance at the Massachusetts Bay Transportation Authority; and
- Greg Hull of the American Public Transportation Association.

Peter Cannito engaged the MTA/MARC staff and Peer Review panel in an open dialogue to understand current practices of MTA/MARC and discuss "lessons learned" from other transit agencies specifically related to the MARC 538 train incident. Mr. Cannito orchestrated the meeting covering: the historic overview of MTA/MARC, the incident overview, review of findings gathered from the interviews with staff, best practices to incident response, and the review of revised procedures.

The Roundtable Peer Review discussion focused on the June 21 timeline of events, communication between MTA/MARC and Amtrak staff, MTA's internal communication network including their Emergency Notification System and coordination with Amtrak's control tower(s) and their functions. Peter Cannito was the facilitator and used a PowerPoint presentation to lead the discussion through the four themes developed by the Assessment Team (Organization, Technology, Standard Operating Procedures and Training, and Communications). Throughout the presentation, discussions took place between the MTA/MARC participants in attendance and the invited peer industry experts who asked questions for clarification and an understanding of the events from the June 21 incident. Specific examples of how particular commuter rail systems responded to similar situations were shared and reviewed.

Focus was provided on key aspects of successful emergency and incident response, including the timely arrival of knowledgeable on-scene coordinators, prior and on-going coordination with emergency response and police agencies, establishing a communications link with control centers and public information officers at the transit agency to provide succinct and timely information for dissemination to customers and other interested parties, such as the media.

The design and implementation of checklists for tracking events and communications during an incident (i.e., what notifications sent and to whom, assuring that appropriate local EMS and police have been notified, identifying an on-scene coordinator, etc.) was also suggested as a way to help avert areas being overlooked.

Police response and coordination was another area the peer review committee stressed. On-scene police are perceived as being responsible for the control and safety of the incident scene. Advanced coordination and interaction with local police departments is crucial so that the commuter rail agency and the police personnel understand appropriate responses and mutual capabilities. The June 21 incident clearly demonstrated the lack of a united police presence.

Training as well as field and desktop exercises with contract operators was another area that the peer review panel noted was important. The peer review panelists also stressed the ability for transit agencies to utilize emergency response teams/ groups to assist with coordination with transit agency contractor staff and emergency responders.

At the conclusion of the presentation, the panelists noted that MTA's and Amtrak's response to the incident was not unusual based on their own transit experiences, however, they noted the importance of conducting regular training, workshops and exercises to assure that all stakeholders can provide the needed response and support in future events.

ASSESSMENT TEAM REPORT: COMBINED FINDINGS FROM INTERVIEWS AND PEER REVIEW

The following findings were gathered during the interview process and the Roundtable Peer Review Discussion. The findings are compiled into four thematic areas identified as opportunities for improvement: Organization; Technology; Standard Operating Procedures and Training; and Communications.

Organizational

1. **Cross-train MARC, Amtrak and CSX staff in emergency response procedures and customer communications**. Based upon the review of other peer agencies and APTA best practices, MTA should review and develop a methodology to update their emergency response procedures annually and train MARC field and Communications Center staff accordingly. MTA should periodically review the emergency response plans from their contract operators to ensure all procedures and training plans are cohesive and current with up to date industry best practices so the information disseminated during incidents to customers is timely and accurate.
2. **Clearly divide roles of customer communications and operational control between appropriately trained staff.** Clarify roles and responsibilities of MARC Communications Center to ensure appropriate staffing and focus training on internal communications and coordination of train operations and incident management. Based upon adequate

staffing, key responsibilities of the MARC Communications Center staff should remain focused on their job specific responsibilities, coordination of train operations and incident management. MARC Communications Center staff should not be responsible for handling customer communications via telephone and social media outlets.

3. **Authorize, identify and train additional resources to adequately oversee and manage a system with the regional breadth of MARC.** MTA currently has two trainmasters assigned to monitor over 200 miles of commuter railroad during the span of 17 hour days on three commuter rail Ines. If Trainmaster coverage during operating hours is determined to be a priority, MDOT and MTA need to identify sufficient resources to provide coverage across all three lines across all operating hours.
4. **Review existing operating agreements with Amtrak and CSX and determine opportunities to improve oversight of training.** MTA should review the operating agreements with Amtrak and CSX, if necessary and feasible, to renegotiate the appropriate sections of the Operating and Maintenance contracts that would provide MTA/MARC more control over the training of the train crews. The goal should be to improve training in customers' communications and providing timely and accurate information during incidents/emergencies.
5. **Create and train an Emergency Response Group/Team to respond geographically to MARC incidents**. Identify appropriate staff across the MTA and MDOT organizations that can be responsive to incidents throughout the state.
6. **Define the roles and responsibilities of the Response Team members so they understand whether they are functioning in a support role, communications role or evacuation/rescue support role.** The training of response staff and ability to mobilize and respond will be required prior to moving forward.
7. **Educate MTA's Customer Service Department on MARC service offerings to better manage customer inquiries related to service issues and incidents.** Customer Services, Media and the Marketing and Communications departments need to be coordinated to support the MARC organization.
8. **Integrate the MARC Communications Center with the MTA control center to take advantage of additional resources**. Consolidating the MARC Communications Center staff and functions with MTA's bus and rail communications staff and resources can help to facilitate and standardize MTA responses to all incidents within the MTA service area and provide cross trained staff that can better manage specific incidents. MTA should also research the existing approaches to providing "bus bridges" or supplementary bus service during a MARC service disruption and reassess the ability to collaborate with the Washington Metropolitan Area Transit Authority (WMATA) and private sector bus resources to better respond to future incidents.

9. **MTA/MARC should improve direct communications with Amtrak's Centralized Electrification and Traffic Control (CTEC) operation.** Interviewees reported information being funneled from CETC to the Washington Union Tower and finally to the MARC Communications Center. MTA/MARC should also work with CTEC to determine if communications could be improved by including MARC representation in their control room.

Technology

1. **Continue with the upgrades to the current tracking capabilities on MARC train to provide more precise information on train tracking and location capability in the MARC Communications Center.** The center currently uses a blocking system that does not allow for a precise and an accurate location of the trains.
2. **Conduct a review of all operations-based customer service systems (PA systems, social media, Maryland Mail and website capabilities) along with all internal and external communication systems.** Upgrade the systems where feasible to ensure consistent, accurate and timely information for in-house staff, contractors and customers. Some of the systems, like the PA system, are currently operating from different consoles in the MARC Communications Center and use different technologies making information distribution to customers difficult and time consuming.

Standard Operating Procedures and Training

1. **Develop and update existing MARC emergency response plans and procedures to include guidance for monitoring and managing escalated conditions for incidents similar to the June 21 incident and proactively preparing for new emergency scenarios.** Use examples gathered from review of peer agencies and update the plans to reflect APTA recommended practices including quarterly multi-agency review committees, training for new and current employees quarterly, gap analysis to evaluate existing agency documents and plans as they relate to safety, security and emergency preparedness.
2. **Develop an operational checklist for MTA/ MARC that clearly defines the roles and responsibilities for each staff member determined to be essential in managing crisis scenarios.**
3. **Update MARC standard operating and emergency procedures and plans on an annual basis** included development and placement of transit service maps and information in MARC stations providing a means to seek alternate transportation modes such as local buses or taxis if required.
4. **Develop and host joint training exercises between MARC, Amtrak and CSX, third party contractors and emergency responders** to practice responsiveness, communication links and adequacy of policies and procedures for either protocol or identifying the need

to revise and update. As an example, MARC discovered that its emergency procedures manual was outdated during the June 21st incident.

5. **Develop integrated communications process for first responders and public information coordinators** through quarterly, semi- annual or annual field and/or table top exercises and identified as a common theme in reviewing the seven peer transit agency preparedness plans.
6. **Develop, track and evaluate mandatory training for all employees** including administering of written competency tests and training drills to ensure employees are qualified and able to perform emergency responsibilities.

Communications

1. **Develop and implement cross-training between MARC Communications Center staff and MTA Customer Service representatives.** Operations staff should not be involved with two-way customer communications during incidents and should be focused on incident management and response coordination. MTA's Media Relations and Marketing and Communication departments need to coordinate customer and stakeholder messages and respond cohesively to incidents/emergencies.
2. **Increase the number of dedicated phone lines into the MARC Communications Center** to help Communications Center staff communicate with stakeholders during incidents. These lines should not be used for customer inquiries about MARC information. During the June 21st incident MARC staff could not reach the Communications Center due to limited availability of phone lines and the number of customer service based calls flooding the phone lines. The Communications Center personnel should focus on managing and reporting information concerning incidents to the appropriate field staff or on scene coordinator.
3. **Develop cross-familiarization exchanges between other MTA departments and MARC staff** particularly if an Emergency Response Group is formed and supported to respond to MARC or other MTA related operations service disruptions.
4. **Develop a centralized, MTA communication capability to ensure standardized messaging for internal and external stakeholders.** Prepare a plan and assure adequate resources are available to update customers through traditional communications channels, phone and internet messages, as well as through social media sites, during emergencies to reduce call volumes to the MARC Communications Center and Call Center.
5. **Standardize and update the public address systems and messaging equipment on MARC station platforms and in the MARC Communications Center** permitting staff to maximize staff time to respond to incidents and emergencies versus using multiple systems and/or failing to notify patrons on platforms during an event.

ASSESSMENT TEAM: FINAL RECOMMENDATIONS

The Assessment Team's final recommendations were developed based on interview findings, the Roundtable Peer Review discussions, the best practices analysis and document reviews. The Assessment Team prioritized the recommendations based on industry best practices, the probable impact in improving MARC incident response and the ability of MTA to implement.

1. Integrated Communications

- **Findings Summary:** All of the employee interviews specified the need for refined communications processes and procedures that would better align the MARC operation within the MTA organization and would assist in providing standardized information to customers in emergency scenarios.
- **Recommendations:**
  - Develop an agency-wide emergency communication plan that integrates communications processes for clear internal staff responsibilities and improved standardized and timely information to MTA/ MARC customers.
    - The plan should include procedures to ensure MARC public information coordinators and emergency responders are primary information recipients.
  - Educate MTA's Customer Information, Media Relations and Marketing and Communications departments' staff on MARC service offerings so that departments can be coordinated in customer outreach efforts, aware of specific MARC informational needs and can proactively address customer concerns thereby reducing the number of calls into the MARC Communications Center.
  - Update and maintain annually, MARC Standard Operating Procedures (SOP), Emergency Operations Plan (EOP) and Emergency Response Plan (ERP) to better manage incidents, escalated incidents and to proactively prepare for new emergency scenarios.
  - Improve MTA's/MARC's communications with Amtrak by:
    - Creating direct communications channels between Centralized Electrification and Traffic Control (CETC) operation and the MARC Communications Center as opposed to information being funneled through Washington Union Tower.
    - Proactively reviewing operating agreements with Amtrak and CSX to better manage training and customer service as it relates to MARC.

2. Staffing

- **Findings Summary:** Interviewees and Peer Review panelists indicated the need to properly staff essential MARC positions with the necessary number of qualified and adequately trained personnel to assist in managing approximately 200 miles of railroad and the needs of 34,000 daily passengers, particularly in emergency situations.
- **Recommendations:**
  - Create emergency response thresholds for incident and emergency response scenarios.
  - Develop an Emergency Response Group that would provide on-site information to customers and train crews and can be activated on an as-needed basis when an incident occurs. *MTA indicated this is currently being developed.*
  - Provide frequent and collaborative training and table top exercises between MARC, Amtrak, CSX, third party vendors and emergency responders to prepare in case of incident or emergency scenarios.
  - Consolidate staff of:
    - MARC Communications Center/Bus Operations Center (interim)
    - All modes into the MTA-wide Central Control Center (long-term)

3. Technology

- **Findings Summary:** Interviews with MTA/ MARC personnel cited the usage of multiple systems of communications for customer notifications and tracking of trains. The current systems are not integrated and it causes communications to be difficult and time consuming.
- **Recommendations:**
  - Enhance and improve communication systems (Emergency Notification System/ public address system/radio and mobile devices).
  - Improve GPS train tracking capabilities and update current mapping location system in MARC Communications Center. *MTA is currently investigating new technologies in the MTA Mobility Control Center and agreed upon technologies can be leveraged to use with MTA-wide Central Control Center.*
  - Increase the number of dedicated phone lines for MARC Communciations Center so that there are sufficient lines for employees in the field to use during emergencies.

Matrix of Actions Taken by MTA to Implement Recommendations

MARC Service Improvements and 538 Incident Response Matrix

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Incident Reviews

Project #	Project / Initiative Name	Brief Description	Status / Notes	Expected Completion
1 (R-1)	**Administrative Review of Employee Performance**	Investigate performance of MTA personnel.	Disciplinary actions complete.	Complete
2 (R-6)	**Senior Amtrak Review Meetings**	Meet w/ senior Amtrak officials to ensure appropriate follow-up on all matters.	Last meeting held Dec 1 2010.	On-going
3 (R-5)	**MARC Emergency Response Coordination**	MDOT emergency operations staff to review: 1. Emergency Operations Plan, 2. Emergency Response Plan, 3. Communications Plan.	Review complete.	Complete
4 (R-3)	**CFR 239 Review**	Debrief incident with MTA, Amtrak, and FRA.	Report completed.	Complete
5 (R-7)	**MARC Staffing Review**	Assess and determine staffing needs for MARC	Initiate upon acceptance of BAH review in Dec 2010	Mar 2011
6 (R-4)	**Independent Evaluation**	Booz Allen Hamilton under contract for following scope: 1. Evaluation of incident 2. Peer analysis 3. Recommendation of new procedures.	Report completed	Complete

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Communication & Outreach

Project #	Project / Initiative Name	Brief Description	Status / Notes	Expected Completion
1 (O-2)	**Immediate Rider Communication**	Distribute follow-up information to riders of Train 538.	Hand copies and e-alert-delivered.	Complete
2 (O-4)	**MARC Supervision**	Assign qualified trainmaster to monitor all evening trains out of Union to enhance communication between Ops Center and MARC management.	Trainmaster at Union from 3-11 PM since 6/29/10.	Ongoing.
3 (O-5)	**MARC RAC**	Secretary, Deputy Secretary & Administrator to attend on rotating basis.	Initiated 6/30/10.	Ongoing
4 (O-6)	**Meet the Amtrak / MDOT Management Event**	Secretary and Amtrak CEO to attend meet with MARC riders at Union Station.	Complete	Complete
5 (O-3)	**Assignment of Service Quality Coordinators**	SQD personnel to ride morning and evening trains to observe service performance and provide direct communication to MTA management if service disruptions occur.	Initiated 7/6/10.	Ongoing
6 (O-8)	**Central MARC Comment Line**	Utilize single phone line to handle MARC complaints and questions; provide additional training for staff.	Use existing number. Priority handing initiated 7/7/10. On-going monitoring of effectiveness continues.	Ongoing
7 (O-10)	**Development 538 Incident Webpage**	Develop dedicated web page for 538 incident updates.	Page launched 7/12/10.	Ongoing

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Project #	Project / Initiative Name	Brief Description	Status / Notes	Expected Completion
8 (O-11)	**RAC Train 538 Feedback Group**	Arrange meeting with CAC members aboard 538 on 6/21 to obtain riders' perspective.	Meeting held with single member. Notes available.	Complete
9 (O-13)	**Post On-Time Performance on Website**	On a daily basis post daily, month-to-date and year-to-date OTP data for all MARC Lines and individual peak PM trains.	Daily digest posted starting 8/23/10.	Ongoing
10 (O-7)	**Ensure Timely Response to Correspondence**	Centralize process to ensure correspondence regarding Train 538 event is quickly and appropriately addressed.	No correspondence received recently.	Complete
11 (O-12)	**Meet the Management**	Continue regular meet the management events.	Events held regularly. Investigating *mobile* meet the management.	Ongoing
12 (O-13)	**Immediate Improvements to MARC Operations Center**	Investigate providing additional phone lines and enhancing the MARC Tracker system. Ensure customer calls are routed to Transit Information Center and not the Operations Center.	Investigation underway.	Mar 2011
13 (O-13)	**Expedite Installation of New Public Address System**	Monitor progress on installation of new systemwide public address system.	Brunswick Line slated for completion Spring 2011.	[]
14 (O-14)	**Rider E-Newsletters**	Utilize e-newsletters to provide information about timely topics; service improvements; status of investigation.	Latest edition was [].	Ongoing

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Initiatives and Responses

Project #	Project / Initiative Name	Brief Description	Status / Notes	Expected Completion
1 (I-3)	**Utilize Protect Locomotives During High Heat Conditions**	Make up trainsets to include protect electric or diesel locomotives on 8- and 9-car trainsets.	Diesel protect locomotives utilized on large trainsets throughout summer season.	Ongoing
2 (I-14)	**Police Response**	MTA Police communicating with MARC-adjacent jurisdictions to reinforce response procedures in existing memoranda of understanding.	Project complete.	Complete
3 (I-5)	**Water on Trains**	Provide emergency water supplies on all trains.	Water placed on all trains. Address pilferage through use of storage closets on cars with this configuration.	Complete
4 (I-4)	**Ridecheck Program**	MTA management riding MARC trains to monitor performance.	Managers rode trains daily through Sept; occasional monitoring continues.	Ongoing
5 (I-2)	**MARC Priority Review Meetings**	Regular meeting to brief Administrator on MARC related issues.	Meetings scheduled.	Ongoing
6 I-21)	**Contingency Buses**	On days with forecasts of 90º or more, maintain 4-5 operators per division on standby for bus bridge deployment.	Implemented and continuous.	Ongoing
7 (I-12)	**Additional Ops Center Support**	Provide additional staff to ensure timely internal and external communication during the summer.	Staff trained and coverage began 7/6/10.	Ongoing

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Project #	Project / Initiative Name	Brief Description	Status / Notes	Expected Completion
8 (I-19)	**MARC CCC Feasibility Study**	Evaluate feasibility and appropriateness of including MARC within new CCC.	Recommendation is to include MARC operations center in CCC.	Complete
9 (I-7)	**MARC "Go Team"**	Senior non-MARC staff to assist in customer response at future incidents.	Team members identified. Drill held 11/17/10 with retired Mobility Vans.	Ongoing
10 (I-17)	**Communication Process Review**	Review current process for receiving and transmitting information about MARC service delays.	Investigating communication lapses to determine recommendations.	Dec 2010
11 (I-1)	**Train 538 Voucher**	Provide Train 538 riders with a complimentary pass.	Processed approx. 900 claim forms.	Complete
12 (I-9)	**Bus Bridge Preparedness & Response Manual**	MARC Ops coordinating with SQD and Bus Ops to ensure knowledge of MARC locations and proactive bus bridge procedures.	Task initiated to update MARC response manual.	Complete
13 (I-6)	**MARC Response Vehicle Readiness**	Equip MARC vehicles with emergency supplies.	Completed.	Complete
14 (I-13)	**Penn Line Schedule and Trainset Review**	Evaluate existing Penn Line schedule with goal of reducing largest trainsets.	Proposed schedule under discussion with Amtrak.	Mar 2011
15 (I-16)	**ENS Procedure Review**	Assess need for any changes in current ENS procedures and use.	Completed	Complete
16 (I-8)	**Mechanical Review of HHP-8 Locomotives**	Analysis of locomotive performance.	Initiated 6/21/10	Dec 2010
17 (I-18)	**Evacuation Drill**	Investigating how to incorporate recent incident in planned evacuation drill.	Drill scheduled for week of 12/5/10 with Prince George's County Fire Department.	Dec 2010

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Project #	Project / Initiative Name	Brief Description	Status / Notes	Expected Completion
18 (I-19)	**SHA Response Assistance**	Develop contact and response protocol for incidents that could benefit from SHA assistance.	Coordination on-going with SHA SOC.	Complete
19 (I-15)	**Training**	Implement training programs on incident management, incident communication, and contract management.	With completion of various investigations developing approach to implement various training programs.	TBD
20 (I-16)	**Amtrak and CSX Training**	Review existing agreements with Amtrak and CSX with regard to training of staff and negotiate possible improvements to training where necessary.	Review underway.	TBD
21 (I-17)	**Revise/Revise SOPs**	Conduct a complete review of all MARC SOPs to ensure up to date and modify where appropriate to reflect recent incident	Review underway	TBD
22 (I-20)	**Brunswick Line Familiarization Tour for SQD**	Conduct a tour of Brunswick Line stations and routes to assist response staff in bus bridge implementation and customer service.	Completed 9/8/10.	Complete
23 (I-21)	**Monthly Trend Analysis**	Create a reporting mechanism to collect, analyze and measure MARC performance.	Data being used during OpStat meetings.	Ongoing
24 (I-26)	**Equip Trains with Bullhorns**	Place bullhorns on trains for use during emergencies.	Bullhorns installed on Penn Line cab cars.	Complete
25 (I-27)	**Conductor Notifications via Mobile Phone**	Require MARC crews receive CTEC messaging.	Completed	Complete

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Project #	Project / Initiative Name	Brief Description	Status / Notes	Expected Completion
26 (I-29)	**Acquire Bridge Plates; Develop Secure On-Board Storage**	Procure metal bridge plates to expedite passenger transfer to rescue trains; design and install secure storage for bridge plates and water supplies.	Procurement underway for bridge plates; design of storage locker underway.	Jan 2011