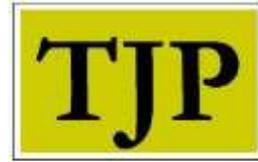


Improving WMATA's Administrative Capacity

Byron A. Ellis – February 25, 2015



The Jethro Project - Last month, 86 passengers in the D.C. area were sent to hospitals and one woman died after thick black smoke engulfed a Metro tunnel, but this is not the first incident of its kind. The Washington Metropolitan Area Transit Authority (WMATA) has a history of unreliability, collisions, injuries and fatalities. Authorities can prevent tragedies by improving anticipatory administrative capacity and personnel training.

Administrative capacity entails translating best practices into actions through effective management and implementation. Capacity is generally defined as the ability to perform functions, solve problems, set goals, and achieve objectives. For instance, the ability to institute effective emergency procedures and improve employees' emergency skills by conducting regular safety drills is a form of managerial capacity.

January's incident comes after other fatal incidents, such as the one that occurred on October 6, 2013, a Red Line tunnel explosion killed one employee and injured 2 Metro track workers; on May 15, 2012, doors on two rail cars opened while a train was moving, threatening passengers' lives; on January 26, 2010, in a Red Line accident two Metro track workers lost their lives when struck by a rail truck. And, one of the deadliest Metro incidents occurred on June 22, 2009, when a Red Line train crashed into a stationary train between Ft. Totten and Takoma stations after the automatic train control system failed, resulting in the death of nine people.

The Washington Post reported that there were 144 smoke and fire incidents in 2012, 86 in 2013 and 104 in 2014. The string of maintenance and safety problems indicates a lack of administrative capacity within WMATA's organization. Clearly, WMATA's maintenance and hence safety strategies are not optimal and are potentially hazardous to riders.

Inappropriate safety and maintenance procedures are managerial problems and without adjustments in WMATA's managerial structure, inefficient execution will continue.

One of the most glaring WMATA problem is the lack of effective managerial oversight and appropriate anticipatory planning and execution. Additionally, direct oversight from local, state, or federal authority over WMATA is also lacking. WMATA is overseen by The Tri-State Oversight Committee, which has no regulatory authority. The National Transportation Safety Board (NTSB) investigates WMATA accidents, but does not have the authority to set or enforce standards.

The NTSB reported that last month's, January 12, 2015, accident occurred at about 3:15 PM EST, when WMATA Metrorail train 302 stopped after heavy smoke filled a car while traveling southbound in the tunnel between the L'Enfant Plaza Station and the Potomac River Bridge. After stopping, the rear car of the train was about 386 feet from the south end of the L'Enfant Plaza Station platform. Another train stopped at the L'Enfant Plaza Station at about 3:25 PM, and was also affected by the heavy smoke. Thus, the Metrorail train 302 had 10 minutes to return to an unoccupied L'Enfant Plaza Station platform before arrival of the next

train. Therefore, given appropriate decision-making, reversing the train to the station would have allowed passengers to safely evacuate the train.

The NTSB preliminary report indicates that an electric breaker tripped (opened) at 3:06 PM causing electrical arcing and smoke. At 3:18 PM, the Office of Unified Communications received an emergency call from a construction worker reporting smoke coming out of tunnel. The first rescue team arrived at 3:31 PM at the 7th and D Street SW, L'Enfant Station; they did not reach the back of the train on the Yellow Line until about 3:40 PM.

At about 3:46 PM another emergency caller reported seeing firefighters on the train about 31 minutes after the train encountered smoke in the tunnel, a significant and critical delay in the rescue operation. Additionally, radio communication worked sporadically and relevant procedures were not available.

At about 3:16 PM the WMATA Operations Control Center began activating exhaust fans to remove smoke from the area. However, NTSB investigation reports that Metro controllers, 11 miles from the scene, activated two exhaust fans behind the train, causing the smoke to move towards the train. Additionally, the train intake (ventilation) system remained operational, drawing smoke into the cars.

In an emergency, it is incumbent to have assigned Metro representatives assessing the scenario at the scene of the incident and relaying critical information to Metro central command. Moreover, it is importance for organizations transporting passengers to have high mechanical reliability and well documented preventive maintenance, safety and emergency procedures.

World class maintenance (WCM) organizations achieve high mechanical reliability by applying integrated logistic support techniques (ILS) to improve operational, mechanical and safety reliability. ILS techniques include failure reporting analysis and corrective action system, it is a systematic approach for identifying all possible ways that an element within a system can fail; reliability centered maintenance (RCM), which is a systematic approach for identifying the most applicable and cost effective maintenance tasks; level of repair analysis and life cycle costing, which are methods of determining the most effective and economical cost of ownership

A streamline RCM study would use a cross-sectional team of organizational stakeholders to evaluate potential failures within the tunnel and device measures to prevent or mitigate them. The RCM study would ask question such as, what are the critical health and safety equipment in the tunnel and how to optimize their reliability? How to properly activate them? Likewise, it would ask about emergency procedures in the tunnel, and who is responsible for overseeing emergencies, and so on.

Apparently, WCM procedures (best practices) are not embedded in WMATA's strategies for operating the Metro system. Thus, WMATA management needs to raise the level of the organization's administrative capacity to be able to gather data to obtain a comprehensive overview of current operational, maintenance and safety procedures; and, use theoretical frames to organize and respond to inherent core problems and challenges. So, WMATA can quickly root out sources of inefficiencies and reduce the high rate of safety incidents.

WMATA, therefore, needs to acquire outside resources with the right administrative capacity to implement robust preventive maintenance (PM) and safety programs, as well as, condition

based maintenance (CBM) programs, where economically feasible, to improve reliability and safety of its operation. Furthermore, WMATA should link all critical life safety equipment, such as exhaust fans to a building automation system (BAS), whereby the central monitoring screens would show the condition of critical assets and the location of trains in emergency situations and their position related to health and safety equipment.

PMs are time-based maintenance checks or inspections, CBM is a management philosophy on the current or future condition of assets; it is an alternative to the PM assumption of time-based failures. BAS provides the organization with the ability to monitor, track and respond to the performance of critical assets.

Augmenting WMATA personnel with new capacity and adapting new strategies that prioritize safety and accident prevention can help end the series of tragedies and ensure riders and workers are safe within WMATA infrastructure.