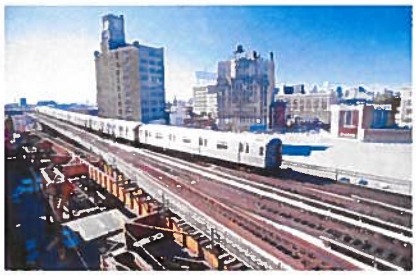
VOLPE
TECH
REPORT

Guidelines for Managing Suspected Chemical and Biological Agent Incidents in Rail Tunnel Systems


March 2002

Federal Transit Administration

National Nuclear Security Administration

NOTICE

This document is disseminated under the sponsorship of the U.S. Department of Energy and the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

Trade or manufacturers' names may appear herein solely because they are considered essential to the objective of this report. The United States Government does not endorse products or manufacturers.

Acknowledgments

This document has been prepared as part of the PROTECT Program, which is a partnership between the National Nuclear Security Administration of the U.S. Department of Energy, the Federal Transit Administration of the U.S. Department of Transportation, and the National Institute of Justice of the U.S. Department of Justice. The authors sincerely thank the reviewers of this document. Their insight and guidance were vital to this endeavor.

Please forward all questions or comments to:

Dr. Anthony J. Policastro
Argonne National Laboratory*
Email: policastro@anl.gov
(630) 252-3235

* Operated by the University of Chicago under Contract No. W-31-109-ENG-38 for the U.S. Department of Energy.

Authors

Anthony Policastro

Emergency Preparedness Group
Decision and Information Sciences Division
Argonne National Laboratory

Frank O'Hare

Law Enforcement Inspector (retired)
New York City Subway System
New York Police Department

David Brown

Emergency Preparedness Group
Decision and Information Sciences Division
Argonne National Laboratory

Michael Lazaro

Atmospheric Sciences Section
Environmental Assessment Division
Argonne National Laboratory

Scott Filer

Emergency Preparedness Group
Decision and Information Sciences Division
Argonne National Laboratory

Reviewers

Rhonda Crawley

Federal Transit Administration

Brian Cronin

Federal Transit Administration

Greg Hull

American Public Transportation Association

Geoff Hunter

Washington Metropolitan Area Transit Authority

Quon Kwan

Federal Transit Administration

Jeffrey Mora

Federal Transit Administration

Edward Pritchard

Federal Railroad Administration

Adrian Rad

Booz, Allen and Hamilton, Inc.

Jennifer Reichert

National Nuclear Security Administration

Harry Saporta

Federal Transit Administration

Christopher Schulte

Federal Railroad Administration

Table of Contents

Table of Contents (Cont.)

Figures

Executive Summary

These emergency management guidelines are designed to help transit managers (1) prepare and implement standard operating procedures (SOPs) for handling potential and actual chemical or biological agent attacks in their rail tunnel system and (2) understand the rationale for the recommended emergency actions. This document can also serve as a background reference guide for the emergency manager to use in developing SOPs, which should incorporate the recommendations presented in this document, together with site-specific operational methods used in the rail tunnel system.

The document is primarily aimed at underground transit environments, including subway systems and commuter rail services that have underground sections. The generally light security currently found in transit systems, as well as the confined nature of rail tunnel systems serving large numbers of people, makes the rail tunnel system a highly vulnerable target for terrorists.

For suspected or actual chemical agent incidents, guidance is given for rail tunnel releases that originate (1) in a station, (2) on a stationary train in a station, or (3) on a moving train between stations. Although no two underground rail tunnel systems are operated identically, the general guidance presented here for those three situations applies to all systems. This guidance is based on state-of-the-art subway dispersion modeling coupled with accepted rail tunnel operational procedures obtained from lessons learned from previous rail tunnel emergencies and emergency preparedness exercises and drills.

For suspected or actual releases involving biological materials, guidance is given separately for (1) handling unknown substance reports and (2) taking steps if a biological agent release is suspected within the system, for these are fundamentally different situations. For reports involving unknown substances, guidance is provided for identifying situations in which a hazardous materials (Hazmat) team should be called in and actions to take while the suspicious material is being investigated. Information is also provided on how to determine if a biological release may have occurred within the system (e.g., physical evidence, mass illnesses, dead rodents, etc.) and the steps to be taken if such a release is suspected.

General Rules* Chemical Agent Incident

- If a chemical agent incident is identified in a station, stop all trains as soon as possible and shut down all ventilation systems, including those in the tunnel, station, and railcars.
- Direct trains to proceed to the nearest clean or unaffected stations.
- Avoid directing trains to move through contaminated areas.
- If a chemical agent incident is identified in a railcar, keep the railcar ventilation system operating and direct the train to move to the nearest station for passenger egress.

Protect Yourself!!!

- Do not enter the hazard zone without proper personal protective equipment (PPE) to avoid becoming a victim.
- Keep others out of contaminated areas.

General Rules+ Unknown Substance Incident

1. Evaluate each questionable situation to determine whether the unknown substance is actually something harmless. It may be harmful if:
   - There is an odor or human health symptoms are present.
   - It is a solid; granules are much finer than sand.
2. If a potential problem is suspected, isolate the area to at least 25 feet, keep people away, and then:
   A. Maintain continued rail transit operation in ways that do not stir up the air around the substance as the Hazmat team arrives. Trains should:
      - reduce speed when passing the incident,
      - operate on the opposite rail, and
      - continue in full operation if far from the incident.

   B. Report the incident to managers who, in case of reported illnesses to public health authorities, will later need to provide assistance on passenger movement.
3. Depend on Hazmat teams for support but only use them if a suspicious substance is identified based on item 1 above.

---

* These general rules should be followed in the event of a rail tunnel chemical agent incident. The specific response measure recommendations to transit managers are provided in Chapter 5. Further details are provided in Appendix A.

+ These general rules should be followed in the event of an incident involving an unknown substance. The specific response measure recommendations to transit managers are provided in Chapter 5. Further details are provided in Appendix C.

1 Introduction

1.1 Objective and Scope

The objective of this guideline document is to help transit managers (1) prepare and implement standard operating procedures (SOPs) for handling potential and actual chemical or biological agent attacks in their rail tunnel system and (2) understand the rationale for the recommended emergency actions. This document can serve as a background reference guide for development of SOPs, which may incorporate the recommendations presented in this document, together with site-specific operational methods used in the rail tunnel system.

The document is primarily aimed at underground transit environments, including subway systems and commuter railroad services that have underground sections. Limited discussions are provided for aboveground facilities and for general passenger rail systems.

1.2 Background

As a result of the 2001 terrorist attacks, concerns regarding potential vulnerabilities to terrorist activities in the United States have become a national priority. Recent incidents involving anthrax-tainted mail and past incidents, including the 1995 sarin gas attack on the Tokyo subway, have heightened concern over potential terrorist attacks involving chemical or biological agents and other weapons of mass destruction (WMD), including radioactive materials. A primary objective of the terrorist when perpetrating a chemical or biological attack is to make a statement by killing and injuring as many innocent people as possible. A secondary objective is to perpetrate limited and random attacks on innocent people to heighten fear and terror. Contaminated mail, for example, is a relatively poor means of disseminating agents; casualties to date have been few compared with the number that could be infected as the result of a major release. Nonetheless, these incidents have increased public concern about terrorism and have resulted in the allocation of significant resources. Terrorists often choose targets that in and of themselves are not generally considered dangerous or hazardous, are relatively easy to access, and are located in the vicinity of large crowds that could be injured or killed as a result of the terrorist event. For obvious reasons, transit systems could be potential terrorist targets and should generally be considered to be at high risk for attack.

Potential hoaxes and actual incidents of biological terrorism require transit operators to make important and informed decisions that can affect the lives and safety of patrons and employees. The number of casualties that could result from a chemical or biological agent incident ranges from hundreds to thousands, depending on the potency of the weapon and the efficacy of the delivery system. In general, a biological attack would not be noticed for days after a release; that is, when medical authorities had positively identified the signs, symptoms, and effects and had determined that the cumulative evidence indicated that a biological incident had

occurred. Transit employees and/or the public, however, could find some evidence of a possible incident. Moreover, evidence could be phoned, mailed, or e-mailed to a transit agency.

As stated above, WMD were used in an attack on the Tokyo subway system in 1995. A similar attack could occur in the United States. It is imperative that managers of rail transit systems that operate in tunnel environments or have underground facilities (including light, heavy, and commuter rail underground systems) plan how to respond to such an incident. The generally light security currently found in transit systems, as well as the confined nature of rail tunnel systems serving large numbers of people, makes the rail tunnel system a highly vulnerable target for terrorists.

Recognition of a chemical agent incident without chemical detectors[1] is likely to come from reports provided by injured people in stations or railcars. This document describes ways in which rail system personnel can identify that a chemical agent incident is underway (or has taken place) and guides rail system managers in developing SOPs and training programs for preventing and responding to such incidents. Further, it suggests guidance for operating train, tunnel, and station fans and provides emergency procedures designed to minimize the number of injuries or fatalities. It also discusses the roles of key transit personnel in carrying out those emergency response recommendations. Finally, transit system managers need to adopt SOPs that make the most sense for their systems based on the principles presented in the general guidance. Therefore, it is important to understand that no one SOP is effective for *all* systems. This guidance will be updated, as needed, based on improvements in the current science of chemical agent dispersion in a subway environment.

In addition, this document provides guidelines that will assist transit agencies in responding to or reporting the finding of a suspected unknown substance that could be either a chemical or biological agent. Information is provided on how to deal with a potential terrorist incident in a preventive, proactive manner.

A biological agent release is nearly impossible to identify at the time of release. However, the transit authority often is confronted with unknown substances that could be of toxic chemical or biological origin. Those unknown substances could be a chemical agent, biological agent, or an innocuous substance.

Transit authorities do not have the trained staff to determine by sight whether a potentially toxic substance is actually toxic. Calling the hazardous materials (Hazmat) team each time an incident is reported overtaxes that valuable resource. This document provides guidance for determining when suspicious substances are likely harmless and when action must be taken to protect lives.

---

[1] Chemical agent detectors, along with sophisticated equipment for alarm communication, are currently being tested for future rail tunnel deployment.

Several examples of incidents faced by transit authorities in the past are provided below:

- A suitcase with the label "anthrax" was found on the top of an escalator in a subway. It was reported to transit workers. What should they have done?

- Transit patrons reported that subway turnstiles near the exit of a station contained a white powder. Two people asked the station manager to investigate the substance. They took him to the location of the powder. What should the station manager have done when he saw the unknown powder?

- A passenger identified an unknown substance on a train and brought it to the attention of the operator. What should the operator have done?

Transit authorities need to know the optimal steps for dealing with these and other situations.

1.3 Lessons Learned from the Tokyo Incident

The Tokyo subway attack was the first time chemical agents were used on a civilian population in a mass transit environment. In this case, sarin vapor was released from five bags placed on trains, which affected three subway lines in Tokyo's downtown area. Sixteen stations were contaminated. Twelve people died as a result of the incident, either at the scene or in transit to the hospital (two additional exposure-related deaths occurred within 16 months after the attack). More than 5,500 people sought medical attention.

Among the lessons learned were that the manager(s) in charge should:

- Stop trains as quickly as possible in the event of a chemical agent release and prevent people from entering the affected stations.

- Set up the Incident Command Post (ICP), mobile command posts, field posts, decontamination areas, triage locations, staging areas, etc., away from and upwind of vents and station exits. Chemical agents can be spread as a result of train movement or weather and can affect both the general population and responders outside the area of the original contamination. Changes in wind direction may require relocation of emergency operations.

- Prevent untrained and unprotected employees or volunteers from attempting to perform rescue and cleanup activities. Only trained and qualified Hazmat personnel in personal protective equipment (PPE), Level A — self-contained breathing apparatus plus fully encapsulating chemical-resistant clothing (permeation resistant) — should attempt rescue. Post-event cleanup activities should begin only after the FBI or local law enforcement agency has released

the scene. The training of transit employees on what to do and what not to do in a chemical incident emergency is of paramount importance!

- Evacuate the affected station and adjacent stations.

- Maintain a list of Hazmat experts or agencies to call in case of a chemical agent incident. These experts can help identify the chemical agent and suggest the best medical treatment.

- Be proactive. Set up Chemical Agent Incident SOPs and a Memorandum of Understanding with other agencies (public and/or private) before a critical incident occurs.

- Train transportation employees and first responders to use the Incident Command System (ICS) or the Unified Command System (UCS) to assist in the efficient and effective use of personnel and equipment. U.S. Occupational Safety and Health Administration regulations for emergency responders [29 CFR 1910.120(q)(3)(ii)] require that the senior emergency response official on the scene implement an ICS. SOP, ICS, and UCS training will save lives and make emergency response much safer for responders and passengers. (Appendix D provides additional information about the structure and function of the ICS.)

- Keep unauthorized personnel away from and upwind of the incident location. An untrained and/or unprotected person willing to assist others can do more harm than good by becoming another contaminated victim and/or spreading the contamination to others.

- Expect hospitals to be overwhelmed.

Other lessons learned have been incorporated into the guidance provided herein. This guidance is based on state-of-the-art subway dispersion modeling coupled with the best of rail tunnel operational procedures learned from actual incidents or emergencies and emergency preparedness exercises and drills.

1.4 Attack Scenarios

In general, a rail tunnel system could be vulnerable to a chemical agent attack in three ways. The first is through a release in either a railcar traveling between stations or a train stopped at a station. The second is through a release in the station complex, including mezzanines, platforms, or entrances to the street. The third is down a ventilation shaft from street level. Since ventilation shafts in most rail tunnel systems are typically away from transit passengers and employees, the first indication that such an attack has occurred would be expected to come from clues in a station or railcar. Evidence that an attack through the ventilation shaft had occurred would likely be noticed because there would be affected passengers in a

passing railcar or nearby station. Since locations where these effects occur (i.e., in a railcar or station) would be similar to scenarios involving releases in railcars or a station complex, this document focuses on the first two scenarios but also applies to the third scenario. The response actions are based on where evidence of an attack first occurs.

Therefore, the two major release scenarios covered by this document are for chemical agent incidents or attacks that are identified either inside the train or inside the station. There are two possible train scenario variations — one that occurs in a moving train between stations and one that occurs in a stationary train at the station.

Each transit agency should determine a plan for each of these types of incidents. Specific response measure recommendations to assist transit managers in preparing a chemical agent incident plan are provided in Chapter 5.

2 How Chemical and Biological Agents Spread in an Underground Transit System

The impact from a chemical or biological agent attack primarily depends on (1) the delivery system used; (2) the amount of agent released; and (3) the purity, quality, and refinement of the agent. Dissemination can occur via evaporation from a spill (i.e., as in the Tokyo attack) or via a more sophisticated device, such as an explosive sprayer or aerosolizer.

Once released, the chemical or biological agent can move through all parts of the subway system, including tunnels; stations; blast and fan shafts; and up escalator openings, stairwells, and elevator shafts (see Figure 1). Specifically, the agent is spread as a result of (1) the piston action from train movement in subway tunnels; (2) naturally occurring airflows resulting from outside weather conditions as well as temperature and pressure variations within the system; (3) uptake into and discharge from railcars due to their heating, ventilation, and air-conditioning (HVAC) systems; and (4) ventilation fans in the rail tunnel system. These processes are explained in greater detail below.

When trains are in operation, the piston action of a train moving in a subway can rapidly move agent around an individual station, from station to station, and to the outside. Schematics showing air movement caused by the piston action of a train moving in a subway are illustrated in Figures 2 and 3. The air movement induced by

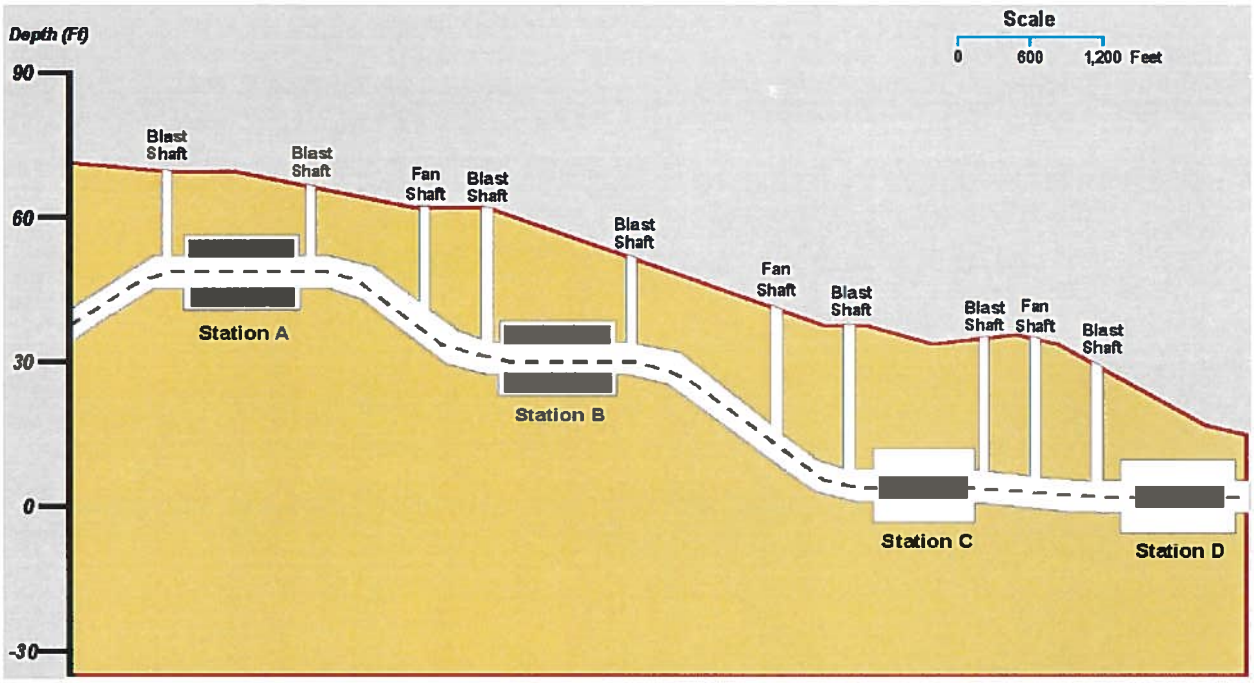


Figure 1 Ventilation Shafts, Tunnel, Stations, and Fans in a Sample Rail Tunnel System

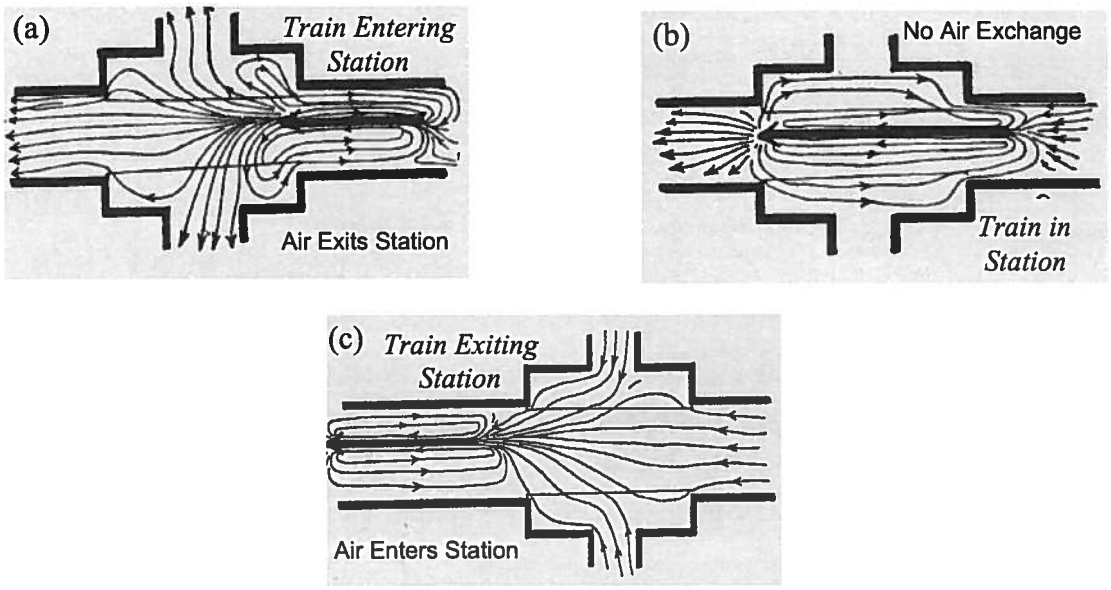


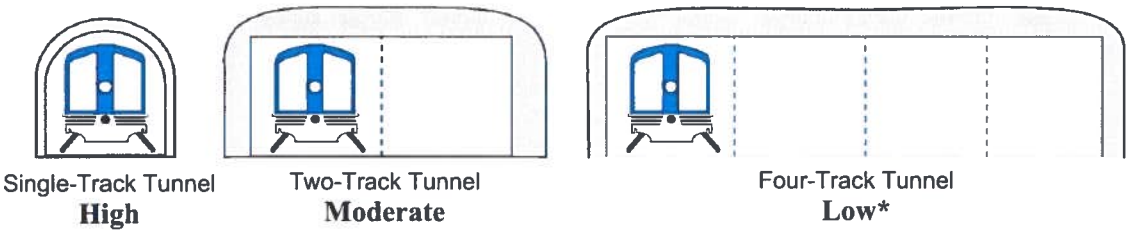
Figure 2 "Piston Action" of Train Movement in Subway, Showing Airflow as Train (a) Enters, (b) Occupies or Passes Through, and (c) Exits a Subway Station (*bold arrowed lines indicate train and its direction*)

train motion, as well as outside weather conditions, forces air out of stations and up ventilation shafts to the outside environment, thus spreading the chemical or biological agent to street level. However, since air exiting the rail tunnel system at one location must be replaced by fresh air entering at another point, the contamination belowground is also diluted.

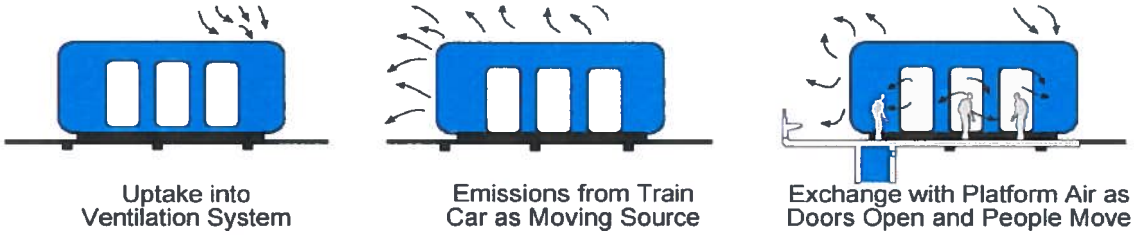
It is important to understand that natural flows are always present in a subway system, and motion by fans and trains can be thought of as being superimposed on these natural flows. Measurements have indicated that such flows can be as much as 5 mph and depend on (1) outside weather conditions, (2) the temperature differences between street level and the subway air, and (3) the elevation differences between the tunnels and street level. **It is critical to remember that even after the trains stop, material can be spread farther through the system and to the outside because of the naturally occurring airflows in the system.**

A chemical or biological agent in a rail tunnel system can also be spread due to the uptake into and discharge from railcars themselves. Ventilation is always "on" in operating railcars, so agents released in a station or tunnel could easily be sucked into the interior of a train through its ventilation system, as well as through the opening and closing of the railcar doors. In this respect, it is useful to think of the chemical or biological agent as an "unwanted passenger" riding the train. While piston action can move considerable quantities of agents between stations, railcars can move these agents much more rapidly, although in much lower amounts.

a) ***Degree of Piston Action in Tunnel Systems***



b) ***Railcar Air Exchange***



* NYCTA (New York City) and SEPTA (Philadelphia), for example, have stacked (one above the other) double-tracked systems in some locations. Those 2 × 2 = 4 tracks act like two separate two-track tunnels in terms of piston action.

Figure 3 Effects of Piston Action and Air Exchange between Railcar and Station or Tunnel

Therefore, within minutes of a release in a station, low levels of contamination will be observed in other stations as trains pass through the affected station and carry the agent quickly throughout the subway line(s). Later (say 5–15 minutes), much higher levels of contamination will begin to affect the subway line(s), as the agent cloud is spread by the train-induced airflow. Clearly, the risk is high that before transit employees realize that a chemical agent incident has occurred, the train has rapidly spread at least low levels of contamination through that subway line and possibly connecting lines.

Exhaust fans in the tunnels and stations will also spread chemical or biological agents and discharge them to the outside if the fans are operating. Fans are always in operation at some transit agencies but are only used during a tunnel emergency such as fire at other transit agencies. In most cases, it is best to shut off all ventilation or exhaust fans if a release is suspected as further discussed in Section 5.2.

3 Preventive Measures

The transit system police and/or other assigned security personnel should be empowered to develop and implement preventive measures to lessen the vulnerability to a chemical or biological terrorist attack. Local police jurisdiction, offices of emergency management, and Hazmat teams should be included in the development of such plans.

Preventive measures are aimed at stopping, averting, or reducing the likelihood of a terrorist attack or other crimes against passengers. Measures currently available can be grouped into (1) *protective planning* or (2) *active surveillance monitoring* measures to enhance the overall security of a rail tunnel system. Protective and surveillance actions should include the use of both existing resources and commercially available technology. The viability of these measures should be carefully weighed by considering the assessed level of threat or vulnerability to an attack and any related purchases and labor costs.

3.1 Protective Security and Planning Measures

Various protective security measures can be considered. They may also have value for preventing or deterring crime against passengers or property of the transit system. These measures include:

- Installation of *intrusion alarm systems* such as infrared detection devices in restricted areas of the rail tunnel and at emergency exit locations.
- Enhancement of entry and exit control for high-threat underground rail stations.
- Enhancement of the perception of security if active-duty employees are not readily identifiable, including a uniform appearance of transit personnel, such as jackets, vests, or caps with agency logo.
- Enhancement of lighting in poorly lit areas and removal of line-of-sight obstructions that could conceal suspicious activities.
- Deployment of personnel to sensitive locations during heightened alert.
- Routine repair of any condition that would be dangerous during an emergency (i.e., inoperable or unintelligible public address system, equipment blocking emergency exits, burned-out lighting, and missing emergency equipment).
- Training of all employees in the provisions of the existing rail tunnel system security plan and emergency response procedures.

- Installation of *variable message sign (VMS)* system (using electronic LED displays) for use as a deterrent to criminals and as an assurance to passengers that safety is a top priority of this transit authority. For example, messages could be used as an alert:

  "*This station is equipped with advanced security and crime surveillance measures to protect patrons. Data collected on criminal activity will be used to arrest, incarcerate, and prosecute offenders to the full extent of the law.*"

  In addition, VMS technology could be used to warn passengers in case of an emergency involving a smoke and/or fire event and direct them to safety (assuming that fire does not affect electric power).

- During an emergency, transit managers should interact with employees and public safety agencies to ensure a coordinated effort.

Other measures specifically for transit safety personnel are listed below:

- Know where all emergency equipment is kept, be familiar with how it is used, and ensure it is in working order.

- Be familiar with emergency response procedures.

- Know the location of all emergency exits and the area around stations.

- Test the system security plan through tabletop exercises and periodic drills.

- Institute heightened security at tunnels and bridges when notified of a terrorist alert.

3.2 Surveillance Security Measures

The transit police and/or the local police with field responsibility, in cooperation or participation with other transit personnel, need to be vigilant against suspicious activities every day. Several key surveillance measures could be implemented, including the following:

- Installation or upgrade of *closed–circuit television (CCTV)* systems, including cameras, to allow for real-time multipoint monitoring and surveillance of vulnerable areas. The CCTV images can be monitored in the rail tunnel system Operations Control Center (OCC) or station managers' kiosks for unusual activities or objects. CCTV monitoring personnel should be trained to heighten their alert to sensitive stations or areas that should be closely monitored. CCTV can also be used to more rapidly verify the existence of a fire/smoke event and to assess conditions throughout a rail tunnel station in the event of fire. A recording function, common to most CCTV systems,

provides invaluable forensics information for follow-up criminal investigation and prosecution.

- Vigilance concerning areas in which objects could be concealed, such as trash receptacles, newspaper vending machines, concession booths, and construction sites.

- Staff alertness for suspicious packages, persons, odors, or activities on or around station areas below- or aboveground.

- Conducting of regular and frequent inspections of tunnels, equipment rooms in tunnels, tracks, bridges, train yards, and repair facilities.

- Establishment of procedures or measures to check identification of all persons entering or exiting nonpublic areas.

Although the foregoing preventive measures cannot eliminate all threats, especially a chemical or biological attack, they should help to mitigate the consequences of such an attack. Each transit agency should conduct its own analysis, establish security plans customized to its system, and develop procedures that would be the most efficient for the safety and security of patrons and employees.

4 Response to Suspicious Substances

Concern by passengers or staff about either an unknown substance (biological) or a potential threat against the transit system should never be ignored. Transit employees must take action in any case to investigate and seek assistance, if needed.

Section 4.1 outlines general guidelines for responding to an unknown substance report on a rail system station, a train en route, and a train in a station. Section 4.2 presents a typical scenario involving an unknown substance report on a station platform, together with an example response hierarchy that uses the general guidance provided in this report. An example protocol for response to an unknown substance report is provided in Appendix C.

4.1 General Guidelines for Responding to Unknown Substances on a Rail System

Unknown substances can take a variety of forms — from powder on the ground to suspicious packages or envelopes left in stations or on railcars. The recent rash of unknown substance reports following the anthrax-tainted letters sent to various government and media persons led the Centers for Disease Control (CDC) to issue guidance for treating suspicious packages and envelopes.

Full Hazmat team response to unknown substance incidents can be very disruptive. As a result, personnel should be trained to recognize when an unknown material is harmless and when a more detailed response may be required. The overwhelming majority of unknown substances found by concerned citizens or transit personnel will be harmless. Early recognition of harmless substances is imperative for limiting disruptions. When confronted with an unknown substance, a transit officer, station manager, or other transit employee should first determine if the substance can be identified. Although this step seems obvious, it was overlooked in much of the hysteria that ensued after the September 11 terrorist attacks. Examples of easily identifiable nonhazardous substances include cleaning residue (i.e., if cleaners had been in the vicinity); food residue, such as powdered sugar; concrete dust left by employees working on the platform; spilled soda; or other liquid on the platform. The following general rules and observations can be adopted as needed to minimize the number of incidents that require Hazmat responses:

- If the "powder" being investigated is coarser than very fine sand, it will not become airborne and will not pose an inhalation risk.

- Although biological agents may be a multitude of colors depending on their preparation (due to the addition of dyes for instance), many, such as anthrax, must be very highly refined to become very light tan or white. As a result, pure white powders are almost always easily explainable as food, cleaning residue, or construction debris. White powders should be taken seriously,

CDC Recommendations for Handling of Suspicious Packages or Envelopes*

What would make you suspicious about a package or envelope?

Visible powder or powder residue that is suspected to be a chemical or biological substance.

What should you do if you encounter a suspicious package or envelope?

- **Do not** shake or empty the contents of any suspicious package or envelope.
- **Do not** carry the package or envelope; show it to others or allow others to examine it.
- **Put the package or envelope on a stable surface.** If suspicion is aroused while handling, **do not** sniff, touch, taste, or look closely at the package or envelope or at any contents that may have spilled.
- **Alert others in the area** about the suspicious package or envelope. Leave the area, close any doors, and take actions to prevent others from entering the area. If possible, shut off the ventilation system.
- **Wash** hands with soap and water to prevent spreading potentially infectious material to face or skin. Seek additional instructions for exposed or potentially exposed persons.
- **Notify** a supervisor, a security officer, or a law enforcement official.
- **If possible, create a list** of persons who were in the room or area when this suspicious package or envelope was recognized. Also create a list of persons who may have handled the package or envelope. Give these lists to the local public health authorities and to law enforcement officials.

*These recommendations are adapted from those published on October 26, 2001, in "Update: Investigation of biological terrorism-related anthrax and interim guidelines for exposure management and antimicrobial therapy." *Mobility and Mortality Weekly Report* (MMWR) 2001;50:909-919 http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5042a1.htm

however, if found in conjunction with received credible threats, potential release devices, or other observed suspicious activites or items.

Each transit agency needs to weigh the threshold at which they will assume a material is harmful, thus requiring field testing by a Hazmat team. The procedures put in place by each transit agency should balance the need to adequately protect the public from exposure to potentially harmful substances against the risks and expense that could result from overreacting to an incident.

If the material cannot be identified and if there is reason to believe that it may be harmful, the first step is to isolate the immediate area (10 feet) surrounding the material. The general recommendations for solid and liquid materials are listed below:

- Liquids that have no odor and are not making people ill do not require evacuation of a station. The immediate area (10 feet) should be isolated, investigated, and cleaned by trained personnel on the basis of the guidelines given in the following subsections.

- Liquids that have an odor and are not making people ill should be treated more carefully because they are probably more volatile. The spill should be isolated to a distance of 25 feet, and the procedures in Sections 4.1.1–4.1.3 should be followed.

- **Any liquids making people ill should be treated as a chemical agent.** Follow the guidelines provided in Chapter 5.

- Powders that cannot be identified should be isolated to a distance of 10 feet, if the powder grains are visible, or 25 feet if the powder grains are too small to be individually discerned. The procedures provided in Sections 4.1.1–4.1.3 should be followed.

Transit agencies may establish a uniform exclusion zone for all unknown substance incidents. In any case, an exclusion zone of 25 feet applies for all incidents except those where people are becoming ill or the material is known to be hazardous.

4.1.1 Rail System Station

If the unknown substance is in a rail system station, the station area should be evacuated to a distance of 10–25 feet depending on the nature of the material as discussed previously. Trains should continue to pass through that station, but without stopping and at no more than 5 mph to avoid creating unnecessary air movement around an unknown substance. If the station has side platforms, trains on the side opposite the unknown substance can continue to operate in a normal fashion, but train speeds should be limited to 5 mph in the station. The HVAC system in the trains should be shut down to avoid taking in air as they pass through

the station. Upon arrival of the first responders, a transit representative should advise the Incident Commander of the actions taken by the transit authority and their concern for the safety of patrons on unaffected trains and stations.

4.1.2 Train En Route

If the unknown substance is in the train or railcars, the train's HVAC system should be shut down as soon as possible so as not to create air movement. The train should proceed to the next station where both the train and station should be evacuated. Upon arrival of the first responders, a transit representative should advise the Incident Commander of the actions taken by the transit authority and their concern for the safety of patrons on unaffected trains and stations.

The Hazmat response team should evaluate and recommend if the train's unknown substance can be contained in the train or railcars and brought directly to the railyard for analysis without endangering transit employees. The train should have its HVAC system turned off all the way to the railyard.

Trains running on the same line, in the opposite direction, or on a train line crossing the station (transfer station) should bypass the station and have their HVAC system shut down so as not to take in air as they pass through the station. Trains should travel at 5 mph through the station so as not to create unnecessary air movement around an unknown substance.

4.1.3 Train in a Station

If the unknown substance is on a train in a station, all passengers and employees should be evacuated. If possible, the train's HVAC system should be shut down. Upon arrival of the first responders, a transit representative should advise the Incident Commander of the actions taken by the transit authority and their concern for the safety of patrons on unaffected trains and stations.

The Hazmat response team should evaluate and recommend if the unknown substance in the train can be contained in the railcars and brought directly to the railyard for analysis without endangering transit employees. The train should have its HVAC system turned off all the way to the railyard.

Trains running on the same line, in the opposite direction, or on a train line crossing the station (transfer station) should bypass the station and have their HVAC system shut down so as not to take in air as they pass through the station. Trains should travel at 5 mph through the station so as not to create unnecessary air movement around an unknown substance.

Note: *In all cases, station fans and/or any ventilation fans in the immediate station area, should be shut down and not restored to operation unless directed by the Incident Commander.*

Finally, not every report of an unknown substance should lead to activation of the procedure outlined above. If, after analyzing and evaluating the information received, the transit representative can determine a logical explanation for an unknown substance being where it is, no action is needed.

4.2 Example Response Scenario for an Unknown Substance Found on a Transit Station Platform

The following scenario illustrates how the guidelines provided in this section can be applied to help a transit agency respond to an incident involving an unknown substance in an underground station. In this scenario, a patron reports to the station agent that there is a suspicious substance on the station platform. The station agent then reports this information to the OCC.

The subsequent list details the sequence of events that occur if proper procedures are followed. Note that most unknown substance response scenarios should end with Part A, that is, when the station agent or other transit employee identifies the substance.

A. Upon notification of the unknown substance by the station agent, the OCC directs that agent to check the location and determine if the substance can be identified. Possible nonhazardous substances include cleaning residue; food residue, such as powdered sugar; sawdust left by employees working on the platform; spilled soda; or other liquid on the platform.

   If a station agent can identify the substance, no further action is necessary. The station agent should ensure that the area has been cleaned.

The OCC should notify other agencies that were called concerning the incident and inform them that the substance was nonhazardous and that service was not affected.

B. If the station agent cannot identify the substance, the OCC should request response by police and/or Hazmat teams. In this case, a tiered response may be appropriate; police or other trained transit personnel are dispatched first. If they cannot identify the unknown substance, a Hazmat team is called. Additional transit personnel are dispatched for on-site assistance as needed.

The OCC should direct the following actions:

- The station agent should cordon off the area and direct passengers to evacuate the general area and stand by for the arrival of first responders.

  - If the location is an island platform, the entire platform should be evacuated unless the material is isolated to one end of the station. When additional personnel arrive, the entire station may need to be evacuated

and closed. Prior to the arrival of the Incident Commander, trains may continue to pass through the station, but at 5 mph or less. Reentry to the affected area should be denied until the incident has been resolved.

- If the station has side platforms, trains on the side opposite the unknown substance can continue to operate in a normal manner prior to the arrival of the Incident Commander, but trains should proceed at 5 mph or less. The side with the unknown substance should be evacuated using the distance criteria set forth previously. Trains operating on the affected side should move through the station at 5 mph or less.

➢ The station HVAC system and ventilation systems in the area of the station should be shut down.

➢ Trains should be directed to bypass the station unless one platform can maintain normal operation as set forth above. Operators should shut down the train HVAC system in the area of the incident, and trains should move through the station at 5 mph.

➢ Passengers should be notified that due to police action a particular station will be bypassed.

➢ Alternate transportation should be provided for passengers (e.g., bus bridge).

➢ The OCC should prepare to close all rail operations in the station area; however, first, the relevant departments and agencies should be alerted because doing so will facilitate smooth closing of the train line and affected train stations.

B.1 If the police and/or Hazmat team determine that a suspicious substance is nonhazardous, no further action is necessary.

➢ The transit representative in command at a station should notify the OCC of the first responders' investigation and determination.

➢ The OCC should direct the opening of the station and resumption of service when the area has been cleaned.

➢ The OCC should direct use of the transit alert system to issue a notification when the station can be opened for service.

B.2 If the police and/or Hazmat team cannot determine that a substance is nonhazardous, the above procedures for train and station should remain in effect unless directed otherwise by the Incident Commander. The Incident Commander may take the following actions depending on the situation.

B.2.1 The Incident Commander may maintain station and train service as outlined in Part B and direct proper hazardous material procedures.

Step 1: The Incident Commander *may* request that rail service be temporarily halted while the Hazmat response team takes samples of the substance.

- The transit representative in command at the station should notify the OCC of the Incident Commander's decision to stop all trains that move through the station.

- The OCC should request that the Incident Commander allow sufficient time for trains to arrive at stations and discharge passengers.

Step 2: The transit representative in command at the station should notify the OCC when rail service can resume through the station.

- The Incident Commander directs that the station should be bypassed at low speed.

- The Incident Commander directs that the station is still bypassed, but trains can operate at normal speed.

B.2.2 The Incident Commander may stop all train service on the affected train line if it has been determined that the continuation of service is a safety risk.

- The transit representative in command at the station should notify the OCC of the Incident Commander's decision to stop all trains that move through the station.

- The OCC should request that the Incident Commander allow sufficient time for trains to arrive at stations and discharge passengers.

- The OCC should implement a contingency plan for service disruption (i.e., alternate bus and/or rail service).

C. When the Incident Commander has determined that the station is free of hazardous material and that the transit authority can reopen the station:

- The transit representative in command at the station should notify the OCC of the Incident Commander's decision to release control of the station and train service, and service can be resumed.
- The OCC should direct that the transit representative in command at the station ensure that the station is clean and free of any residual debris left by the first responders.

- When the transit representative reports to the OCC that the station is ready for restoration of service, the OCC should direct the reopening of the station.

- The OCC should direct that train service begin at the station and resume normal speed controls.

- The OCC should direct the reactivation of the station's HVAC systems and ventilation systems in the area of the station as required.

- The OCC should direct the activation of the transit alert system, and passengers should be notified that service has been resumed.

- The OCC should notify all departments and agencies contacted that the incident has been resolved and service has been restored.

***Note**: In order for this procedure to be implemented, all response agencies must coordinate their procedures. Tabletop exercises, agency drills, and full field exercises will enhance response and maximize the safety of patrons, employees, and first responders.*

5 Response to Chemical Agent Incidents

Because of the volatility and reactivity of chemical agents, their effects are typically abrupt and obvious. Determinations as to whether an attack has occurred may be made by either detection or (more often than not) victim symptomatology. The physiological impacts on patrons as well as transit employees may lead to the immediate conclusion that they have been exposed to a chemical agent.[2] It is important to recognize key signs and symptoms of chemical exposure in order to react rapidly. More than any other type of attack, a chemical agent incident requires a speedy reaction by transit personnel because it will have a direct impact on the numbers of lives saved or lost. The following discussion provides guidelines for dealing with chemical agent incidents throughout the transit system.

5.1 Recognizing When a Chemical Incident Has Occurred

Early recognition that a chemical agent incident is occurring is of paramount importance for saving lives. Some key observations that will help in recognizing a chemical agent attack are provided in the textbox at the right. Because an attack using known chemical weapons cannot be distinguished from an attack using an industrial chemical, the guidelines should be used only in a general sense for determining whether an attack may have occurred, not for identifying the chemical agent used.

The consensus on when to report a possible chemical incident is as follows: two or more passengers and/or at least two transit workers suddenly experience one or more of the listed symptoms with no obvious cause. The suggestion that two passengers exhibiting symptoms be required to confirm a potential chemical agent incident is based on

How to Recognize a Potential Chemical Agent Incident

Passengers/Transit Personnel: You may observe two or more people (passengers and/or transit employees) suddenly…

- Experience breathing difficulty or uncontrollable coughing
- Collapse
- Complain of nausea
- Suffer seizures
- Complain of blurred visions
- Complain of an unusual odor*

Possible Early Warning Signs Include…

- A pungent smell leading to coughing or covering of mouth*
- Threat of attack prior to onset of the above symptoms
- A suspicious object or package leaking liquid and/or emitting a vapor or odor

***Note**: Some chemical agents produce little or no odor (in pure form), and most chemical agents do not produce a visible cloud.*

[2] Some biological toxins may cause symptoms that are similar or indistinguishable from chemical agents.

the likelihood that symptoms in one member of the much larger passenger population are due to non-exposure–related illness. For more information about the characteristics and effects of individual agents, see Appendix E.

Training of transit personnel to recognize a chemical agent incident and what to do in response (see Section 5.2) is highly recommended.

Once the OCC staff receives a report of a potential chemical agent incident, they should quickly ascertain from the transit personnel reporting the incident that there are no other obvious or reasonable explanations for the situation, such as someone holding a weapon and running away from two collapsed people. If the OCC staff has ruled out any other reasonable explanation for the report, they should declare a potential chemical attack, and the response measures outlined below should be initiated.

5.2 Response Measures

The following response strategy measures recommend actions to be taken by transit authority personnel if they believe that an attack has occurred in a railcar (Section 5.2.2) or in a station (Section 5.2.3). The sample public address (PA) announcements given in Section 5.2.3 for rail tunnel station releases also apply to a chemical agent incident in a railcar.

5.2.1 Train Stoppage and Venting Versus Containing

Two key questions immediately arise when confronted with a potential chemical agent incident: "What do we do with the trains?" and "Do we vent the chemical agent to street level or contain it underground?" Computer simulations of alternative strategies have shown the following:

- In all cases, stopping trains as soon as possible is the best strategy. Movement of trains spreads the agent, although there is some dilution associated with it. Stopping trains and shutting down the HVAC system also slows contaminated air from entering adjoining railcars or adjacent trains.

- In most cases, it is best to contain a rail tunnel release rather than to turn on station and/or ventilation fans. It is a common misconception that venting to street level is the better choice because it purges the agent to the outside environment, where the agent is diluted. By the time an incident is identified and fans are turned on, however, it is likely that a great deal of belowground damage has occurred. Venting to the street potentially creates more casualties because people at the street level are then exposed. Although this finding may not apply in all cases, until further studies show otherwise, *containment* is the best guidance for all transit systems to follow. This guidance could be optimized for a rail tunnel system if site-specific analyses were performed.

5.2.2 Recommendations — Release in a Railcar

There are two response strategies for an incident involving a chemical agent in a rail tunnel train or railcar. One involves a release when the affected train is in the tunnel between stations, whereas the other involves a release when the affected train is at the station. The in-tunnel scenario presents the greatest challenge in terms of added time required for safe evacuation of the affected train passengers and the coordinated response actions required by nonincident trains in the vicinity of the affected train. Conversely, an in-station railcar incident requires a lesser degree of coordination with the OCC. Furthermore, an in-station railcar incident allows for passenger evacuation from the railcar without the necessity of moving to a platform suitable for exiting the train. Once an incident is recognized, the transit employee making the observation should immediately inform the OCC of a potential chemical agent incident and provide as much detailed information as possible. Upon receiving approval from the OCC, the responsible person should immediately implement guidance appropriate to the release scenarios identified below.

5.2.2.1 When the Affected Train Is between Stations

Operator of the Affected Train between Stations

Simple Rule 1: **Before entering a station, discourage passenger movement between cars; panic may ensue and spread contamination.**

Simple Rule 2: **Only if directed by the OCC, run affected train to the next station as quickly as possible, with the HVAC system running.**

- At the station, open all doors and instruct passengers to evacuate to street level.
- Instruct passengers who do not need assistance to move quickly away from station entrance(s).
- Ensure that passengers who need assistance seek help from emergency personnel at street level.

Operators of all trains in the vicinity of the affected train:

- When possible, shut down the train HVAC system from the cab. Many existing railcars, typically older system designs, do not allow for a single switch control of the HVAC system. For example, all of the rapid rail system's rolling stock in Chicago and most of Boston is designed in this way.

- For all trains on the same track in front of the affected train: If possible, shut down the train HVAC system from the cab or at least shut down the HVAC system in the cab car. Run trains past at least one station (to allow room for affected train to berth at next station) before stopping and directing passengers to exit the train and leave the station.

- For all other trains approaching the affected train: Shut down the entire HVAC system from the cab or at least shut down the cab's ventilation system.

- Train reversal rule: With OCC approval and if the action can be *safely executed*, reverse the train's direction to increase separation from a potentially expanding hazard zone.

5.2.2.2 When the Affected Train Is at a Station

Operator of the Affected Train at a Station

Simple Rule 1: **Evacuate the affected train and station.**

Simple Rule 2: **If needed, adjust berthing (train position) at the station to aid passenger evacuation from railcars.**

- Instruct passengers who do not need assistance to move quickly away from station entrance(s).
- Ensure that passengers who need assistance seek help from emergency personnel at street level.

Operators of all trains in the vicinity of the affected train:

- For trains approaching or nearly approaching the affected train in a station: Under OCC direction, stop the train, shut down the train HVAC system, and reverse the direction of the train toward the previous station.

- If possible and as required, adjust berthing at the station to aid passenger evacuation from railcars in case a train is already at that station.

5.2.2.3 Discussion and Rationale — Release in a Railcar

In general, the quickest way to get passengers to safety and medical attention (if needed) is for the train operator to move the train to the nearest station. Stopping the train and opening the doors in a tunnel could lead to a long evacuation process, potentially taking hours. In addition, injured passengers would have difficulty getting

medical assistance, while uninjured passengers would be subject to slipping, tripping, or falling in the tunnel.

In many systems, individual railcar ventilation systems cannot be shut down unless an operator does so with a key inside each railcar. This may not be practical during an incident in a tunnel or at a station. Shutting off the railcar ventilation system in an affected or contaminated car could aggravate conditions for passengers in that car. Conversely, keeping on the ventilation of the affected car can lead to continuous ejection of the agent into the tunnel. The chemical agent that might be coming from the affected railcar(s) (e.g., through door leaks) could be picked up by other cars on the same train (that are drawing in tunnel air for ventilation) as well as by other cars on trains in the vicinity of the incident. Computer modeling indicates that the uptake of agent-contaminated air by other moving cars on the affected train is very small and can be ignored in most cases. Consequently, the recommendations are to:

- Keep the ventilation system on for the affected car.

- Shut off the ventilation in all adjacent cars of the affected train if they, with reasonable certainty, have not experienced a chemical agent release. This may not be possible, depending on the railcar design. However, any measures that can be taken safely and quickly to protect the lives of passengers should be done.

- Shut off the ventilation systems in all trains in the vicinity. This reduces the uptake of contaminated air before these trains reach the nearest non-contaminated station.

- Discourage passengers from moving between cars.

For the second and third items above, the recommended simpler response action is to keep the ventilation system on for the incident railcar and shut off the ventilation system for all trains in the vicinity of the affected train. With their HVAC systems shut off, unaffected trains nearby should continue to the nearest stations. The lack of central control in many of the existing railcar HVAC systems is due in part to the design of those systems.

5.2.3 Recommendations — Release in a Station Complex

The recommendations for an incident occurring at a station complex are provided below. The PA announcement is intended to evacuate people from the station without causing panic. The exact wording of the announcement should be sufficiently specific to produce the most orderly and rapid evacuation, keeping in mind the safety of patrons.

5.2.3.1 Rail Tunnel Station Chemical Agent Incidents

The following samples of suggested alternative PA system announcements could be used by managers in developing rail-tunnel–specific chemical agent incident response plans or SOPs. The objective is to word these announcements in a way that creates a sense of urgency so that passengers will leave the station as quickly as possible without causing panic.

> *"There currently is an investigation and response to a hazardous material spill in the transit system. Train service to this station has been stopped. Exit to street level in a safe and orderly manner."*

or

> *"There is a police investigation ongoing in this station. There will be no train service at this station. Everyone must leave this station immediately."*

OCC Response for a Tunnel Station Incident

Simple Rule 1: **Allow trains to exit the station slowly, at less than 5 mph.**

Simple Rule 2: **Stop all train service from entering the contaminated station.**

Simple Rule 3: **Immediately shut down train HVAC system.***

* Following this rule reduces the likelihood of endangering passengers within the train. If shutting down the HVAC system for the entire train cannot be controlled in the cab, shut down the HVAC system in the cab car only. Doing so will help protect the operator so he/she can help others.

- **Do not** use emergency fans to exhaust chemical vapors to street areas, which may be the recommendation provided in SOPs for fire and smoke emergencies.

- For releases in *aboveground stations*, evacuate passengers away from the scene of the incident (determined by the location of casualties) and, if at all possible, in the upwind direction. Avoid directing a train from an aboveground environment to belowground, since dilution with fresh air is reduced in confined areas. The belowground strategy of preventing trains from entering contaminated areas and preventing incoming passengers from entering the station remains in effect.

5.2.3.2 Discussion and Rationale — Release in a Station Complex

For a chemical agent release on a train at the station, the train operator or conductor should open the doors and allow patrons to evacuate rapidly. Because of the potential danger to the train operator, he/she should not wait to shut the train doors after the riders have evacuated, even though it may help contain the release. Keeping the railcar doors open gives passengers an opportunity to escape, whereas closing the doors traps passengers inside. By keeping doors open and allowing all passengers to leave first, the train operator can rapidly aid in evacuating passengers and himself/herself.

When the chemical agent release is at the station and a train is present, evacuating passengers off that train through the station to the outside may send them directly into the chemical cloud. In that case, taking the train to the next station is recommended, but the speed of motion should be less than 5 mph so as not to cause airflow, which would spread the contaminant cloud.

Passengers are to be instructed through the PA system to evacuate in the opposite direction of the incident or release. There is some controversy as to whether people will actually evacuate from the exit that is announced via the PA system. Rather, passengers may exit as they are accustomed to, not as directed. The decision to provide instructions via the PA system needs to be based on the specific design of the rail tunnel system and knowledge of passenger behavior during similar incidents (i.e., fire and smoke events).

There may be concern that passengers evacuated to the street level will congregate outside the station. To address this concern, an outer perimeter "safe zone" (i.e., the area outside the "hot zone") should be established at least 1,500 feet from station entrances, fan shafts, vent shafts, and emergency exits to keep people and unprotected responders from entering a hazardous station environment. In addition, the PA announcement should direct passengers away from the station, for example, in the direction of upwind bus bridge(s) and at a sufficient distance from the station entrance and the tunnel ventilation vents. A temporary quarantine area (if necessary for contaminated passengers) should be established in a secure or cordoned-off area of the established safe zone. It should also be at least 1,500 feet from station entrances, fan shafts, vent shafts, and emergency exits.

5.2.4 General Guidance — Recovery and Restoration of Services

Decontamination and cleanup are part of the recovery phase after a chemical agent incident, but these subjects are not covered in this guidance.

Subsequent to the response and recovery phases after a chemical agent incident, the following general *responsibilities and objectives* should be kept in mind:

- Assist the police department and other public safety officials with equipment and vehicles to mitigate an incident and expedite recovery.

- Provide alternate modes of transportation (e.g., bus bridges).

- Assess and mitigate secondary impacts on the system.
- Strive for rapid restoration of service.

- Make it a priority to restore passenger and employee confidence in transit service.

6 Response to Biological Agent Incidents

A terrorist incident involving a suspected biological agent is extremely difficult to identify. Technological advancements in biological agent detection have occurred at a rapid pace, but stand-alone biological agent detectors are still not practical or sustainable for continued use in the rail tunnel environment and will not be for several years. Although a biological agent initially may be discovered as a powder or liquid in a railcar or train station after being released, it is more likely that an actual attack would be identified following a threat or after employees or patrons have become ill. Section 4 addressed the issue of responding to the generic problem of finding an unknown substance. This section provides more detailed guidance on identifying and responding to a suspected biological agent incident beyond those actions necessary for a generic unknown substance incident.

Section 6.1 discusses the identification of, and Section 6.2 provides guidance for, responding to a suspected bioterrorism event. Section 6.3 outlines measures that could enhance and maintain readiness for an incident of this kind.

6.1 Identifying a Bioterrorism Event

The initial clues that a bioterrorism incident may have occurred may arise due to threats, intelligence, or the onset of illness in patrons or employees. During the initial investigations, transit-specific information is needed to ascertain if a biological agent release may have occurred on the transit system. Although every situation is different, the following questions should be addressed where applicable:

- If people are reporting illnesses, have most of them used the transportation system?
- Has someone reported finding a dispersal device on the transit system?
- Did a patron or an employee report that he/she observed a person dispersing a substance on the transit system?
- Has a patron or an employee reported unusual liquids, droplets, oily film, unexplained vapors, and/or an oily liquid seeping from an unattended package?
- Did employees report that they observed an unusually high number of dead rodents?
- Does the information gathered and reported indicate that the transit agency is possibly under attack and that there is reasonable danger to the lives or the security of patrons and employees?

In the event that members of the general public are reporting illnesses and a biological agent release in the subway is suspected, the travel history of those people will need to be determined. Similar to criminal investigations, identifying victim commonalties will be of paramount importance in isolating whether a biological agent has been released and where that release occurred.

6.2 Responding to a Suspected Bioterrorism Incident

If the results of the investigation indicate that a biological terrorism incident is a realistic possibility, the response actions will depend on the evidence discovered.

If a suspected material or a dispersal device is found *and* if the threat is deemed credible, the general steps outlined for response to an unknown substance should be taken. This procedure is summarized below:

- If the threat credibility is completely unknown, the transit agency must analyze the target area, infrastructure function, level of impact, level of media impact, and the pattern of previous reports or incidents and/or hoaxes. The transit agency will evaluate the information provided and make the decision to either continue operations or follow a plan of action for a credible threat incident.

- If the threat is credible, the steps provided in Section 4, *Responding to Suspicious Substances*, should be followed.

- Cooperation and coordination of the response by the transit authority and first responders (police, fire, medical services, and Hazmat team) will enhance the safety of patrons and employees, reduce delays, facilitate return to normal operations, and maintain public confidence in the transit system.

If a release is suspected because patrons or employees have become ill, or if a release is confirmed by other measures, the public health service or other government entity may declare a bioterrorism incident. In the event of a large number of illnesses or a large-scale attack, such a declaration may lead to widespread fear and panic on the part of the public and transit employees. Therefore, plans should be in place for handling media inquiries, union concerns, and widespread disruption of service while the incident is investigated and the affected areas are decontaminated. As part of the investigative and restoration processes, the transit agency should conduct or assist in the following activities:

- Actual victims should be questioned to ascertain their past activities and their potential use of the transit system. Their responses will help in identifying commonalties.

- Potential victims should be identified and given preventive treatment, if applicable, for the biological agent identified or suspected.

- The stations and trains that might have been involved in the release should undergo biological testing (if not already done) under the direction of the public health agency, law enforcement agency, or other government organization. **Cooperation of the transit authority in identifying trains and/or buses that were in service during the incident time period is of paramount importance.**

6.3 Enhancing Readiness for a Bioterrorism Incident

Transit agencies should conduct the following actions to enhance and maintain/justify readiness in the event of a bioterrorism incident:

- Maintain contact with the FBI and with state and local authorities concerning threats in the area and threats received by other transit authorities.

- Keep the transit environment clean so that unknown substances or suspicious items will be evident.

- Instruct all transit employees to be vigilant in watching for unusual or suspicious items and for items out of place. Also develop a reporting procedure.

- Maintain contact with the CDC to ensure that transit procedures for a biological incident response plan are updated.

- Keep daily statistics on the number of transit employees requesting medical leave, noting if an unusual increase has occurred (e.g., 10 absences per day spiking to 100 per day). Spikes in medical aid requests should be reported and investigated by the public health network.

- Establish a committee to coordinate transit plans, practices, and procedures with first responders. Such procedures should ensure that an integrated plan of action is in place for all responding agencies in the event of a biological agent incident.

- Conduct tabletop exercises, operations drills, and full field exercises to test response.

Appendix A: Generic Standard Operating Procedure (GSOP) for Chemical Agent Incident

Introduction

In light of recent events, such as the Tokyo chemical agent attacks, as well as the potential for terrorist incidents taking place in the United States, it is important for Operations Control Center (OCC) personnel to be aware of the potential danger of a deliberate chemical release. It is also paramount that appropriate response procedures be in place to adequately respond to such incidents and minimize their effects.

The procedures that follow were developed from discussions about the operating procedures of transit system managers and operators from two large subway systems and from the review of existing related standard operating procedures (SOPs) for three other transit agencies. A comprehensive review of general and emergency operation procedures and subway system engineering designs indicates that the procedures outlined in this appendix represent the best and most current practices for saving lives in a chemical agent incident. Information on specific transit response team protocols and responsibilities is provided in Appendix B.

GSOP Actions to Be Taken

A difficult but critical task is the identification of a possible incident involving the use of chemical agent. A possible chemical agent release should be suspected when the transit OCC receives a report of **two or more** persons experiencing symptoms, such as seizures, convulsions, breathing difficulties, or loss of consciousness, **with no obvious cause** (e.g., smoke exposure). It is extremely important to get as much information as possible about the passengers' symptoms and relay this information to the police and fire departments immediately. All other emergency response field personnel in the area must also be notified.

The two major release scenarios covered by this GSOP are for chemical agent incidents or attacks that occur either inside the train or the station. There are two possible train scenario variations — one that occurs in a train moving between stations and one that occurs in a stationary train at the station.

This GSOP also applies to a release made from a ventilation shaft. Note that the effects from a ventilation shaft release would likely appear to be similar to a release in a train or station.

The chemical incident scenario response procedures are described in the following sections.

1a. Affected Train between Stations

The train operator will continue to take the train to the next station, immediately evacuate all passengers and employees to the street, and await assistance. The heating, ventilating, and air-conditioning (HVAC) system will remain on until the train reaches the station and then will be shut down immediately. Passengers and transit personnel who are at the station, but not on the affected train, will evacuate the station before that train enters the station. All service personnel will be prevented from entering the area until the OCC receives an "all clear" from the police, fire department, or hazardous materials experts. Any trains trapped between stations will be directed to the appropriate station by the OCC.

1b. Affected Train in Station

All service will be stopped, and passengers will be prevented from entering the station at which the affected train is located. Employees will be instructed to evacuate passengers to the street level and await assistance. Any trains trapped between stations will be routed back to the previous station.*

**Note: More than one station along that line may need to be used if trains are operating on close headways.*

2. Within Affected Station Complex

If an incident occurs in a station, all trains will be prevented from entering that station. All trains outside the station will be sent back to the previous station. Close headways may prevent this action. Any train entering the station will be instructed to shut off its HVAC system, bypass the affected station, and proceed to the next station at 5 mph. Upon the train's arrival at the next station, all passengers will be evacuated to the street.

Rail Tunnel Ventilation Fans

In general, ventilation fans will not be used unless requested by the police and/or fire department.

Public Communications

The OCC will be responsible for arranging for appropriate public address (PA) announcements at all affected stations.

The PA announcement will be worded and delivered in a way that strikes a balance between prompting rapid evacuation of the station and not inciting panic. Examples of possible wording of a PA announcement are given below. Transit managers will be in the position to know what will work best for their system and ridership.

"*Train service to this station has been stopped. A possible hazardous materials release has occurred at this location. Exit to street level now in a safe and orderly manner and await further instructions.*"

or

"*There will be no train service at this station. There is a police investigation occurring in this station. Immediately exit to the street level and await further instructions.*"

This page intentionally left blank.

Appendix B: Generic Standard Operating Procedure (GSOP) Protocol by Response Team Group Members

Transit Police

- **Contact appropriate first response personnel** (fire department and other local/state authorities).
- **Establish an outer perimeter "safe zone"** at least 1,500 feet from station entrances, fan shafts, vent shafts, and emergency exits to keep people and unprotected responders from entering a hazardous station environment.
- **Assist in establishing a command post** for the Incident Commander (dispatched from the fire department) at the incident scene.
- **Direct all inquiries made by jurisdictional police** officials to the Incident Commander.
- **Establish a temporary quarantine area** for contaminated passengers in a secured or cordoned-off area of the established "safe zone" (area outside the "hot zone") at least 1,500 feet from station entrances, fan shafts, vent shafts, and emergency exits.
- **Assist with crowd control/evacuation** and establishment of a staging area.
- **Coordinate field activities** with local police and the Incident Commander at the scene.
- **Direct all inquiries by the news media and the public** to the Incident Commander's Public Information Officer.

Rail Operations and Passenger Safety Personnel

- **Halt all trains in affected areas and adjacent connecting lines and bring them slowly to the nearest station.**
- **Instruct trains approaching the affected station to stop prior to reaching the approach circuit and stand by for specific instructions from the OCC.**
- **If practical, re-route trains approaching the hazard zone to a previous station at a low rate of speed (less than 5 mph).**
- **Instruct the train operator to immediately proceed out of the station to the next station.**
- **Initiate passenger and employee public address (PA) evacuation announcements for the affected station(s) (see sample Chemical Incident PA announcements in Appendix A).**
- **Verify that ventilation fans are off and kept off, unless otherwise directed by the Incident Commander.**
- **Immediately notify police and fire departments.**
- **Contact personnel on the rail emergency call list.**

Issue instructions to stop the trains at the nearest station and evacuate passengers to the surface in a direction that is away and upwind from the contaminated area and wait for responders.

Transit On-Scene Supervisor/Coordinator (Assigned by Transit Operations Control)

- **Notify OCC rail dispatch of the arrival and activity of the "first responder" team.**
- **Notify OCC of any change of command resulting from shift or personnel changes and notify OCC of the status of activities.**
- **Inform OCC of expected locations of the Incident Command Post, boundaries of the incident scene, staging area, etc.**
- **Notify OCC of personnel assigned and/or requested, responding units' phone numbers, and radio frequencies being used.**

Train Operator

Upon noticing one or more chemical effects, the train operator or any other on- or off-duty transit employee should notify the OCC immediately by radio. The notification should warn of a potential chemical agent incident and give detailed observations.

A. In-Station Incident

- **Immediately shut down the HVAC system in the cab car. Shut down the HVAC system in each car of the entire train, if this action would not endanger the train operator's life and would not cause panic.**
- **Wait for instructions from OCC to proceed to adjacent unaffected station at speeds less than 5 mph.**

B. In-Railcar Incident

Affected or Contaminated Trains

- **If the affected train is in a station, with the OCC's approval, quickly evacuate passengers from the train to a street area and await assistance.**
- **If the affected train is between stations, with OCC permission, run the train to the next station as quickly as possible with the HVAC system running and follow:**
  - ***Simple Rule 1:*** **Before reaching the station, discourage passenger movement between cars.**
  - ***Simple Rule 2:*** **At the station, open all doors to allow passengers to evacuate via the nearest exit to street level.**

Unaffected Trains

- **For all unaffected trains in the vicinity of the affected train and/or station, shut down the HVAC system in the cab and, with communication and approval from the OCC, follow:**
  - ***Simple Rule 1:*** **For trains behind the affected train: reverse train direction (if this action can be safely and quickly executed) to increase separation from a potentially expanding hazard zone, proceed to the next station away from the incident at speeds less than 5 mph, and quickly evacuate passengers to street level.**
  - ***Simple Rule 2:*** **For all trains in front of the affected train: run trains past at least one station before stopping and directing passengers to exit the train and leave the station. The requirement to skip at least one station allows room for the affected train to enter the nearest forward station.**

Customer Assistants and Station Agents

- Verbally warn persons in other nearby station areas of the notice to evacuate.
- If at all possible, assist disabled passengers in exiting the station.
  - Stop escalator movement into the affected station, but permit escalators to continue to operate to help people exit the station.
  - Prevent people from entering the station via street elevators, but do not block the exit of potential victims.
- Assist people in safely exiting the station without placing yourself in danger.

Appendix C: Example Protocol for Rail Tunnel Transit Response — Procedures for an Unknown Substance

The following standard operating procedure (SOP) was derived from a current transit agency SOP. The purpose of this SOP is for responding to unknown substances throughout the transit authority.

TRANSIT AUTHORITY

SOP FOR RESPONSE TO UNKNOWN SUBSTANCE

1. Description

This procedure addresses a release or spill that presents no adverse health symptoms or no perceived or obvious threat. When the Operations Control Center (OCC) or the transit police receives notice of an unknown substance found in a station, train, wayside, or transit facility, this procedure will be followed.

2. Response to Notification of Unknown Substance

Rail OCC Supervisor

a. Notify Transit Police Department, jurisdictional Fire and Rescue Services, Maintenance Operations Center, and Bus Operations Control Center.

b. Call Fire Department, using plain language and addressing the problem as an unknown substance.

c. Immediately shut down all ventilation fans and notify personnel to close all air vents in affected underground station(s).

d. Instruct train operators per SOPs given in Sections 4, 5, and 6 below.

Passenger Operations

a. Notify the station manager.

b. Contact personnel on the Rail Tunnel System Emergency Call List.

c. Have OCC activate the Passenger Information Display System.

Maintenance Operation Center (MOC)

a. Instruct field personnel to move to a safe area.

b. Account for all employees.

Station Manager

See SOPs given in Sections 4 and 5 below.

3. On-Scene Commander (OSC)

The Transit Police Department is designated as the lead transit system department for coordinating the mitigation of any unknown substance incident. If no Transit Police Department representative is present at the initiation of an unknown substance incident, the first Transit Police Department officer to arrive at the incident scene will immediately assume on-scene command duties.

4. Unknown Substance on Train in Tunnel or Outdoors

When an unknown substance incident is reported on an identified train, the OCC will:

a. Stop the train at the nearest station and off-load passengers.

b. Shut down the HVAC system.

c. Proceed to the nearest yard.

d. Provide estimated head count of patrons on the affected train to the OCC (train operator is responsible).

e. Ascertain all personal information on patrons who were off-loaded from the train (station manager is responsible).

5. Unknown Substance on Right-of-Way

a. Stop train traffic in both directions. Shut down the train HVAC system, if possible and practical.

b. Shut down the tunnel ventilation.

c. Keep single-track trains around the affected area at speeds less than 5 mph.

6. Unknown Substance in a Station

a. **On the platform:** Discontinue service to the station. The train should continue at 5 mph through the station; request shuttle bus service. Isolate the affected area.

b. **In the mezzanine area:** Close the entrance to station. The train should continue at 5 mph through station; request shuttle bus service when necessary.

7. Definitions

a. **Safe zone:** An area that has been determined to be free of secondary devices or contamination and to be out of the hazardous zone and clear of any station entrance, escalator, elevator, vent shaft, or emergency exit where dangerous fumes may escape to the atmosphere. If practical, a safe zone should be upwind at least 1,500 feet from any point of danger.

b. **HVAC system:** A rail vehicle or station heating, ventilation, and air-conditioning system.

c. **Unknown substance:** A release or spill that appears to have no adverse health symptoms, no smell, no perceived or obvious threat, and no evidence of tampering and is not located or positioned in a manner that indicates an attempt to conceal its presence.

This page intentionally left blank.

Appendix D: Coordination under the Incident Command System and Unified Command System

The Incident Command System (ICS) is:

- A standard emergency management framework for interagency management of disasters, *without being hindered by jurisdictional boundaries*
- Required by federal law for response to hazardous material incidents
- A flexible management structure for communicating and coordinating emergency response

The ICS:

- Enables various emergency responders to establish a common set of objectives and a single plan of action for managing the incident
- Has functions that can be grouped under three areas: Operations, Logistics, and Finance/Administration

The Unified Command System (UCS = ICS/team approach):

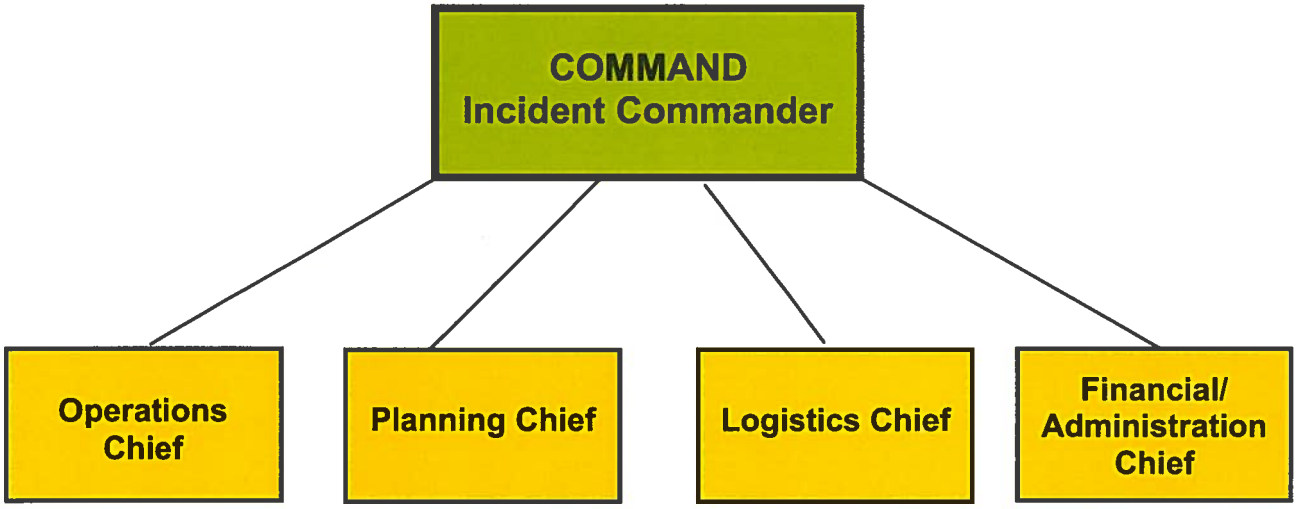
- Develops overall incident objectives, selects strategies, engages in joint planning with federal, state, and local officials and in integration of tactical operations with these entities
- Allows Incident Commanders to change as the incident priorities change
- Sets up a collective approach to develop strategies without losing or abdicating agency authority, responsibility, or accountability

The Incident Command System develops and uses:

- **Consolidated Action Plan** — Contains data on resources being used from multiple agencies, jurisdictions needed and utilized, personnel and equipment requirements over an extended time frame, documentation, overall and tactical objectives, incident assessment, and development of strategic goals
- **Comprehensive Resource Management** — Completes assessment of incident, develops goals, assigns resources in priority order: Incident Command Post, Operations, Planning/Intelligence, Logistics, and Finance
- **Manageable Span of Control** — The nature of the tasks dictates span of control
- **Common Terminology** — Plain language, not codes or agency jargon or vernacular

The Incident Command System has functional responsibilities:

- **Command** — *Incident Commander:* Sets objectives and priorities, has overall responsibility at the incident or event, and is supported by a Safety Officer and an Information Officer
- **Operations** — *Operations Section Chief:* Conducts tactical operations to carry out the plan, develops the tactical objectives and organization, and directs all resources
- **Planning** — *Planning Section Chief:* Develops the action plan to accomplish the objectives, collects and evaluates information, maintains resource status
- **Logistics** — *Logistics Section Chief:* Provides support to meet incident needs and provides resources and all other services needed to support the incident
- **Finance/Administration** — *Financial/Administration Section Chief:* Monitors costs related to incident and provides accounting, procurement, time recording, and cost analysis



Appendix E: Chemical Agent Quick Reference Guide*

Nerve Agents (GA, GB, GD, GF, VX)

Code	Common Name	Chemical Name
GA	Tabun	Ethyl N, N-dimethyl phosphoramidocyanidate
GB	Sarin	Isopropyl methyl phosphonoflouridate
GD	Soman	Pinacolyl methyl phosphonoflouridate
GF	GF	Cyclohexyl methyl phosphonoflouridate
VX	VX	O-ethyl S-(2-diisoproplylaminoethyl) methyl phosphonoflouridate

Physical Appearance/Odor	Colorless to brownish liquids, with a consistency ranging from that of water to light machine oil to honey (can be thickened with various substances or thinned when diluted with solvent). Little or no odor when pure.
Effects (signs and symptoms)	Vapor: Small pupils, runny nose, shortness of breath, or tightness of the chest Liquid: Sweating, nausea, vomiting, involuntary urination or defecation Vapor or Liquid: Convulsions, temporary cessation of respiration
Period of Onset (after exposure)	Vapor: Tens of seconds to about 2 minutes Liquid: Minutes to hours
First Aid	Antidotes: Inject Atrophine alone or in combination with pralidoxime chloride. Use diazepam if required to control severe convulsions.
Skin Decon	Immediate gross decontamination with fresh water, soap and water for skin, copious water for eyes
Detection	Vapor: M258A1, a portable detector surveillance kit used to detect vapors during the agent attack response phase (widely used U.S. military chemical agent detector kit) and chemical agent monitors (CAMs), post-attack devices used to detect vapors emanating from residual liquid contamination Liquid: M8/M9 papers

* The guidance provided in this appendix may not apply to some blister agents (i.e., the mustard agents) because the onset of symptoms will likely occur after passengers have exited the rail tunnel environment.

Blister Agents (H, HD, L, CX)

Physical Appearance/ Odor	May be in a liquid or solid form; colorless when pure, but generally amber to black
Effects (signs and symptoms)	Cause inflammation, blisters, and general destruction of tissues; also redness of the skin, blisters, eye irritations, cough, and shortness of breath
Period of Onset (after exposure)	Hours (immediate pain after Lewisite exposure)
First Aid	Generally, no antidote is available. Dimercaprol (also known as BAL) can be used for Lewisite exposures and will alleviate some effects, but the ointment is not currently manufactured.
Skin Decon	Immediate gross decontamination with fresh water, soap and water for skin, copious water for eyes
Detection	Same detectors as used for nerve agents (i.e., M258A1, M8/M9 papers, CAM)

Blood Agents (AC, CK)

Code	Common Name	Chemical Name
AC	Hydrogen cyanide	Hydrocyanic acid
CK	Cyanogen chloride	Cyanogen chloride

Physical Appearance/Odor	Either volatile liquids or gases, mostly colorless. Odors can range from mildly pleasant to harsh and irritating. The ability to detect the odor of some agents is transient and may provide the false impression that agents are no longer present.
Effects (signs and symptoms)	Stops the transfer of oxygen from blood to the rest of the body and results in loss of consciousness, convulsions, temporary/cessation of respiration, and eye irritation and tearing
Period of Onset (after exposure)	Seconds
First Aid	Lilly Cyanide Antidote Kit (amyl nitrate, sodium nitrite, and sodium thiosulfate)
Skin Decon	None usually needed
Detection	M258A1

Pulmonary or Choking Agents (CG, PFIB, Cl, HCE)

Code	Common Name	Chemical Name
CG	Phosgene	Carbonyl chloride
PFIB	Teflon 7 pyrolysis product	Perfluoroisobutene
Cl	Chlorine	Chlorine
HCE	Distopan	Hexachloroethane, Perchloroethane

Physical Appearance/Odor	• CG – colorless gas with an odor like new-mown grass • Cl – greenish-yellow gas with pungent, bleach-like odor
Effects (signs and symptoms)	Shortness of breath at first with exertion, and later at rest; initial hacking cough, and later with frothy sputum
Period of Onset (after exposure)	2 to 24 hours after exposure
First Aid	None usually needed
Skin Decon	None

Tearing Agent (CS, CN) – Also Used by Police in Riot Control

Code	Common Name	Chemical Name
CS	CS gas	Ortho-chlorobenzylidinemalononitrile,
CN	MACE, Tear gas	alpha-Chloroacetophenone

Physical Appearance/Odor	• CS – white crystalline solid with pungent pepper-like odor • CN – colorless to gray crystalline solid with sharp irritating odor similar to apple blossoms
Effects (signs and symptoms)	Burning, stinging of eyes, nose, airway, and skin
Period of Onset (after exposure)	Seconds
First Aid	Flush eyes with water
Skin Decon	None

This page intentionally left blank.

Appendix F: Potential Biological Terrorism Agents and Characteristics

Possible Biological Warfare Agents

Agent	Infective Aerosol Dose	Incubation (days)
Anthrax	8,000–50,000 spores	1–5
Brucellosis	10–100 organisms	5–60
Plague	100–500 organisms	2–3
Q fever	1–10 organisms	10–40
Tularemia	10–50 organisms	2–10
Smallpox	10–100 organisms	7–17
Viral Encephalitides	10–100 organisms	VEE: 2–6 E/WEE: 7–10
Viral hemorrhagic fevers	1–10 organisms	4–21
Botulinum	0.001 µg/kg	1–5
Staphloccal Enterotoxin B	Incapacitating: 30 µg/kg	1–6
	Lethal: 135 µg/kg	1–6

Estimates of Casualties Produced by Hypothetical Biological Attack*

Agent Downwind Reach	Distance (km)	No. of Fatalities	No. of Incapacitated
Rift Valley fever	1	400	35,000
Tick-borne encephalitis	1	9,500	35,000
Typhus	5	19,000	85,000
Brucellosis	10	500	125,000
Q fever	>20	150	125,000
Tularemia	>20	30,000	125,000
Anthrax	>20	95,000	125,000

* "Release of 50 kg of agent by aircraft along a 2-km line upwind of a population center of 500,000," *Health Aspects of Chemical and Biological Weapons,* World Health Organization, 1970.

This page intentionally left blank.

Appendix G: Considerations for Commuter Rail Transportation

The guidelines in the main portion of this document cover rail transit. It also applies, however, to commuter rail operators and sponsoring agencies. The following special topics are presented for discussion.

Large Distances between Stations

Because of the relatively isolated tunnel portals and other points of egress (e.g., ventilation shafts and emergency exits), passenger commuter rail operators should be aware of the heightened potential for a chemical or biological agent incident with respect to the placement of devices in railroad tunnels. For example, a person could walk into a tunnel from a remote location and place a device that, when hit by a train, would dispense a chemical or biological agent. This scenario is more relevant for railroads than for rail transit because the former generally has fewer train movements. Further, by reading public schedules, a person can easily determine when trains will (and will not) be operating.

Commuter rail systems have few passenger stations in tunnels. Accordingly, it may be necessary for commuter rail operators to adapt the procedures in these guidelines with respect to the movement of trains in such tunnels.

Long Trains

Commuter trains often carry many more people than rail transit trains. Rescue operations must take into account the length of commuter trains and the possibility that a large number of passengers may be on a single train. However, the guideline recommendations described in the document apply to both short and long trains.

Higher Speeds of Commuter Rail Trains

Commuter rail service usually operates at speeds higher than that of rail transit systems. Accordingly, railroad operators can expect a heightened "piston" action in tunnels, as described earlier in this document. The response actions should not differ.

Coordination with Freight Operators

In some locations, freight railroads operate in the same tunnels as passenger trains. It will be necessary for freight and passenger operators to coordinate their efforts during emergency situations.

Railroad Locomotives

Because the majority of railroads use diesel locomotives, exhaust fumes should be considered during emergency planning with respect to the evacuation of passengers. In addition, the dispersal of agents by the locomotive engine cooling systems needs to be considered. Electric locomotives also have large air-cooling systems. Electric self-propelled and nonpowered coaches have smaller traction cooling systems that are distributed throughout the entire train. These factors should be under consideration in standard operating procedures for diesel or electric operations.

Emergency Egress

This document does not directly discuss emergency egress, but it should be kept in mind that all operators need to maintain emergency egress in tunnels. Specifically, pathways to emergency exits in stations and the track areas need to remain clear of debris and railroad materials to facilitate evacuation through tunnel areas. Emergency exit doors, ladders, etc., need to be maintained for safe use.

Affected Trains between Stations

For commuter rail, the guidance is for a contaminated train to move immediately to the next uncontaminated station. Once it has been determined that there is a potential chemical agent incident, the train should be evacuated at the location where passengers can safely egress and move away from the train.

Appendix H: Weapons of Mass Destruction Threat Checklist

EXACT TIME OF CALL:	TIME CALL ENDED:	LENGTH OF CALL:
EXACT WORDS OF CALLER:		
QUESTIONS TO ASK:		
1. WHEN IS THE BOMB GOING TO EXPLODE?		
2. WHERE IS THE BOMB?		
3. WHAT DOES IT LOOK LIKE?		
4. WHAT KIND OF BOMB IS IT? (TIME) (ANTI-HANDLING) (FUSE) (TRIPWIRE)		
5. WHAT WILL CAUSE IT TO EXPLODE?		
6. DID YOU PLACE THE BOMB?		
7. WHY?		
8. WHERE ARE YOU CALLING FROM?		
9. WHAT IS YOUR ADDRESS?		
10. WHAT IS YOUR NAME?		

SEX OF CALLER	RACE	AGE	NUMBER AT WHICH CALL IS RECEIVED	TIME	DAY	DATE

DESCRIPTION OF CALLER'S VOICE				If the voice was familiar, whom did it sound like?			
EXCITED	ANGRY	SLOW	LOUD	CRYING	FAMILIAR	DEEP	DEEP BREATHING
SLURRED	NASAL	RAPID	LISP	NORMAL	LAUGHTER	RAGGED	CLEARING THROAT
STUDDER	CALM	SOFT	RASPY	DISTINCT	DISGUISED	ACCENT	CRACKING VOICE
WHISPERED VOICE							

THREAT LANGUAGE:		Well Spoken		Message Read		Incoherent		Irrational		Foul		Taped

BACKGROUND SOUNDS:												
	STREET NOISES		OFFICE MACHINERY		LONG DISTANCE		MOTOR		CLEAR		ANIMAL		DISHES
	HOUSE NOISES		FACTORY MACHINERY		PA SYSTEM		MUSIC		STATIC		BOOTH		VOICES

REMARKS:
REPORT CALL IMMEDIATELY to OCC or Police
PERSON MAKING REPORT:
POSITION:
TELEPHONE NUMBER:
Note: If the threat is for a chem/bio incident, substitute "bomb" with chemical/biological agent.

This page intentionally left blank.

Appendix I: Emergency Phone List

The following space is provided for your use. Feel free to fill in phone numbers of personnel who may be needed during a chemical or biological agent incident.

_____ Local FBI Hazardous Materials Response Team

_____ Local FBI Counter-Terrorism Agent

_____ Transit Police

_____ Local EPA Representative

_____ Transit Agency Media Relations Representative

_____ Fire Department

_____

_____

_____

_____

_____

_____

This page intentionally left blank.

Appendix J: Acronyms/Glossary

CCTV	Closed-circuit television
CDC	Centers for Disease Control
FBI	Federal Bureau of Investigation
GSOP	Generic standard operating procedure
Hazmat	Hazardous material
HVAC	Heating, ventilating, and air-conditioning
ICP	Incident Command Post
ICS	Incident Command System
NYCTA	New York City Transit Authority
OCC	Operations Control Center
OSC	On-Scene Coordinator
PPE	Personal protective equipment: Protective clothing, including mask (i.e., self-contained breathing apparatus, often called by its acronym, SCBA)
SCBA	Self-contained breathing apparatus
SEPTA	Southeastern Pennsylvania Transportation Authority
SOP	Standard operating procedure
UCS	Unified Command System
VMS	Variable message sign

This page intentionally left blank.

Appendix K: Useful References

Boyd, A., and J. Sullivan, 1997, *Emergency Preparedness for Transit Terrorism*, TCRP Synthesis of Transit Practice 27, Transit Cooperative Research Program, Transportation Research Board.

Federal Emergency Management Agency (FEMA), 2001, *Guide for All-Hazard Emergency Operations Planning, State and Local Guide (101), Chapter 6, Attachment G – Terrorism*, April, http://www.fema.gov/library/allhzpln.htm

National Domestic Preparedness Office, 1999, *On-Scene Commander's Guide for Responding to Biological/Chemical Threats*, Nov. 1.

Sidell, F.R., W.C. Patrick, III, and T.R. Dashiell, 2000, *Jane's Chem-Bio Handbook*, Jane's Information Group, Alexandria, Virginia, April.

U.S. Department of Transportation, Transport Canada, and Secretariat of Communications and Transportation of Mexico, *2000 Emergency Response Guidebook*, http://www.tc.gc.ca/canutec/erg_gmu/erg2000_menu.htm

This page intentionally left blank.