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INTRODUCTION

Purpose

Today's tabletop exercise (TTX) offers first responder agencies the opportunity to identify possible weaknesses in responding to a mass casualty terrorist attack.

Scope

The scope of the Respuesta Inmediata al Tren Urbano TTX encompasses the decision-making process, communication, and coordination of a multi-agency response to a terrorist attack on the Tren Urbano, or Urban Train, involving an improvised explosive device (IED) with a chemical/hazardous materials (HazMat) component.

Emphasis will be placed on communication, coordination in an emergency response, integration of resources, and identification and resolution of problems.

Objectives

The objectives of the Respuesta Inmediata al Tren Urbano TTX are as follows:

- Evaluate the capabilities (communication, personnel, equipment, and training) of the first responder community in the event of a mass casualty terrorist incident.
- Evaluate the ability of first responder agencies to coordinate a response to a mass casualty terrorist attack using the incident and unified command frameworks.

Exercise Structure

The Respuesta Inmediata al Tren Urbano TTX is a multimedia-driven and subject-matter expert (SME)-facilitated exercise. The exercise is presented in four distinct phases, or modules. Each module begins with a multimedia update summarizing key events occurring within that time period. After each update, participants will review the situation and engage in a group discussion of appropriate response issues. Participants will then take part in a facilitated caucus, where they will present their groups' actions based on the scenario and discuss their interactions with other agencies.

Each exercise participant receives this situation manual (SITMAN), which provides a written storyline to accompany the multimedia situation

ROLES

Participants respond to the situations as presented based on experience and knowledge, as well as on the current plans and procedures used within their agencies.

Observers may support the participants in the group as they develop responses to the situation. However, they are primarily invited to observe the exercise and preparedness process.

Facilitators provide situation updates and moderate group discussions. They also provide additional information or answer questions as required.

Evaluators observe and record the discussion during the exercise, participate in the data analysis, and assist with drafting the after-action report. They are generally drawn from non-playing members of participating organizations, contractors, or peer organizations.

updates. Following each corresponding module in the SITMAN is a series of questions that highlight pertinent issues related to the objectives of the exercise. These questions are supplied as a catalyst for group discussions. Participants are not required to answer every question, nor are they limited to discussing only those topics.

Participants are encouraged to use their SITMAN as a reference throughout the exercise. Resource materials are thus provided in this document's appendices on agent information and beneficial information resources.

Exercise Guidelines

- This exercise is intended to foster an open, low-stress environment.
- This is not a test. Varying viewpoints, even disagreements, are expected.
- The exercise setting is the ideal opportunity to consider different approaches and suggest improvements to current resources, plans, and training.
- Responses should be based on current capabilities (i.e., you may use only existing abilities and assets).
- You are not "stuck" in your group. Feel free to interact with other agency representatives and get answers when needed.

Exercise Assumptions and Artificialities

In any exercise, a number of assumptions and artificialities may be necessary to complete the exercise within the time allotted. During the Respuesta Inmediata al Tren Urbano TTX, the following apply:

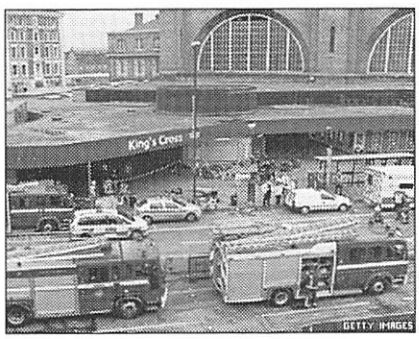
- There is no hidden agenda and there are no trick questions intended to mislead participants.
- All participants receive information at the same time.
- Participants should assume that all jurisdictions are implementing their current plans, procedures, and protocols.

Respuesta Inmediata al Tren Urbano TTX

Background

The terrorist attacks of September 11, 2001 left many indelible footprints on the American soil. In addition to shattering the myth of "Fortress America," new ideas and difficult decisions emerged about how best to safeguard the United States and its citizens. Our new security landscape is painted in color-coded threat conditions from the Department of Homeland Security, with precaution and preparation serving as guiding principles.

Among the gravest threats in this new landscape are attacks aimed at our public transportation systems. These systems provide terrorists with ripe targets that not only present the possibility to inflict mass casualties, but also to cause significant economic damage and disruption to our daily way of life. Indeed, 9/11 made use of a critical public transportation system – the airline industry – to wreak widespread death, chaos, and destruction. However, terrorists have more recently turned their sites to the rail and bus transit systems of the West. As the attacks in 2004 in Madrid, Spain and the attacks this year in London, England demonstrate, terrorists can and will strike these targets. The resulting potential for massive destruction and disruption cannot be underestimated.



While these specific attacks involved only the use of improvised explosive devices (IEDs), the possibility of terrorists adapting their tactics and incorporating more sophisticated elements cannot be overlooked. A prime likelihood in this regard is for terrorists to combine IED attacks with the release of a chemical, biological, radiological, or even nuclear device.

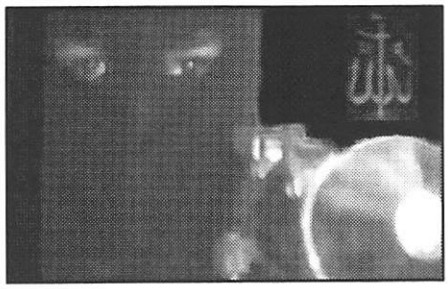
Faced with this prospect, it is incumbent upon Federal, State, and local leaders to prepare for the prevention of incidents, and to ensure that proper response plans are in place when prevention fails.

Agenda

8:00 a.m.	–	9:00 a.m.	Registration and Breakfast
9:00 a.m.	–	9:30 a.m.	Welcoming Comments
9:30 a.m.	–	10:30 a.m.	Module 1
10:30 a.m.	–	10:40 a.m.	Break
10:40 a.m.	–	11:40 a.m.	Module 2
11:40 a.m.	–	12:45 p.m.	Lunch
12:45 p.m.	–	1:45 p.m.	Module 3
1:45 p.m.	–	1:55 p.m.	Break
1:55 p.m.	–	2:55 p.m.	Module 4
2:55 p.m.	–	3:25 p.m.	Conclusions, Questions, and Answers
3:25 p.m.	–	5:25 p.m.	Hot Wash

MODULE 1 – INDICATORS

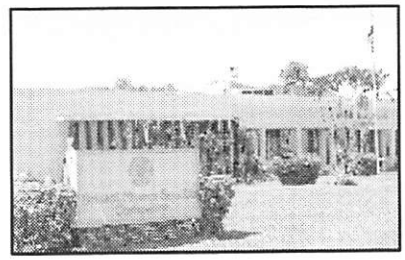
Saturday, July 23, 1:15 p.m.



A Middle Eastern news satellite station broadcasts a videotape issued by a purported brigade commander for a terrorist group. In the video, the man warns the United States not to feel secure with its new counterterrorism measures. The man points out the recent subway attacks in London, and adds that there are plenty of targets in the U.S homeland and elsewhere that can be struck.

Tuesday, July 26, 3:15 p.m.

An employee of a major pharmaceutical manufacturer in Humacao phones local police to report that a storage area where industrial-grade sulfuric acid is kept seems to have been broken into. A 5-gallon container of sulfuric acid appears to be missing.



Saturday, August 6, 8:15 a.m.

The attendant at an information desk in Martinez Nadal station notifies the ATI Operations Control Center (OCC) that she observed two men in a car videotaping the entrance of the station. She reports that the men were making an effort to conceal their activities. She adds that she witnessed the men filming the station for at least 20 minutes, but believes that the car was there longer; however, she does not remember seeing the men in it beforehand.

Once the men realized that the attendant was watching them, they quickly departed. The attendant described their car as a red Toyota Tercel, but was not sure of the year or license plate number.

Module 1 — Questions

Review the following questions in their entirety, then discuss the group's major concerns at this point in the exercise scenario. Participants are not required to address every question in this section.

Participant Questions

1. What policies, plans, procedures, and capabilities are in place to ensure that information is collected, analyzed, synthesized, and disseminated to the appropriate agencies and personnel?

2. What agency should have the lead role?

3. How does the information change your agency's operations and security procedures?

MODULE 2 – INCIDENT

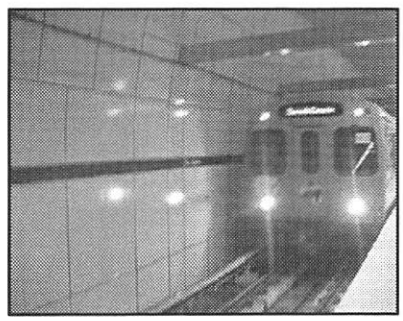
Friday, August 12, 7:45 a.m.

It is 77 °F and is expected to climb well into the 90s by noon. Conditions are clear with a 5–10 mph wind from the northeast, and heavy humidity.

The morning rush hour on the Tren Urbano is picking up, and crowds flow into the stations.

Friday, August 12, 8:15 a.m.

As a northbound train travels the tunnel between the Rio Piedras and the Universidad stations, an explosion tears through one of the passenger cars.



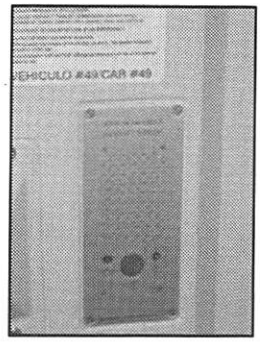
Friday, August 12, 8:17 a.m.

Frightened crowds at the Rio Piedras and Universidad stations react to the noise and panic when they see smoke emerging from the tunnel. In the ensuing stampede to exit the stations, many people are trampled and wounded. The stations are littered with personal belongings dropped in the melee. At least three people are trampled to death, a mother and her two children, at the Universidad station.

Respuesta Inmediata al Tren Urbano TTX

Friday, August 12, 8:18 a.m.

Trapped passengers make calls to the train's driver from the emergency intercoms in the cars. The driver, however, has been seriously injured and does not respond. Passengers who are able to get a signal are making calls from their cell phones. A flood of emergency calls from the surrounding area begins to overwhelm the city's emergency call center.



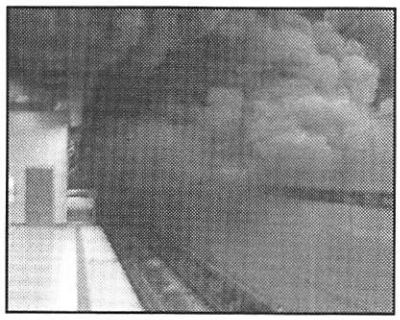
Friday, August 12, 8:21 a.m.

State Police near the Rio Piedras station rush to the scene.

Friday, August 12, 8:30 a.m.

Additional fire, ambulance, police, and Puerto Rico Emergency Management Agency (PREMA) personnel rush to the two stations. News reports of the explosion in the tunnel are broadcast on local television and radio stations.

Friday, August 12, 8:32 a.m.



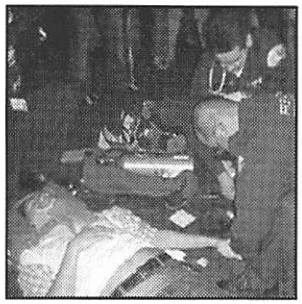
As first responders arrive onscene, thick black smoke is bellowing into the Rio Piedras and the Universidad stations from the tunnel. Injured and hysterical people are streaming out of the stations and clogging entry points. Station managers have also opened emergency escape routes at both stations, and injured people are making their way up the emergency stairways and out of the stations.

Friday, August 12, 8:36 a.m.

First responders at the Rio Piedras station report that there are least 20 severely injured people who were trampled by the mob. There are dozens of others with minor injuries.

Respuesta Inmediata al Tren Urbano TTX

Friday, August 12, 8:37 a.m.



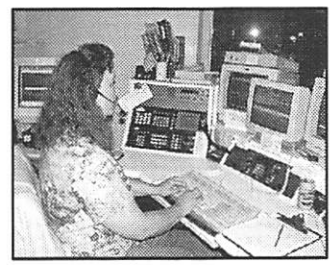
First responders at the Universidad station report that there are at least 37 severely injured people who have been trampled by the mob and almost twice as many with minor injuries.

Friday, August 12, 8:39 a.m.

The mayor of San Juan calls the municipal emergency operations center (EOC) for an assessment of the situation.

Friday, August 12, 8:40 a.m.

Calls continue to pour into San Juan's emergency call center. Callers are not only reporting the incident, but are also asking about the status of loved ones they fear may have been riding the trains. Tren Urbano, City Hall, and police and fire headquarters are also inundated with media inquiries for information concerning the incident.



Friday, August 12, 8:45 a.m.

First responders begin entering the tunnel from both stations to reach the trapped victims.

Friday, August 12, 8:48 a.m.

A flood of telephone calls across the city overwhelms communication capabilities and brings the system down.

Friday, August 12, 8:50 a.m.

Crowds of civilians gather near both stations, taking pictures and discussing the situation. Some are helping victims who are coughing violently and rubbing their eyes in pain.

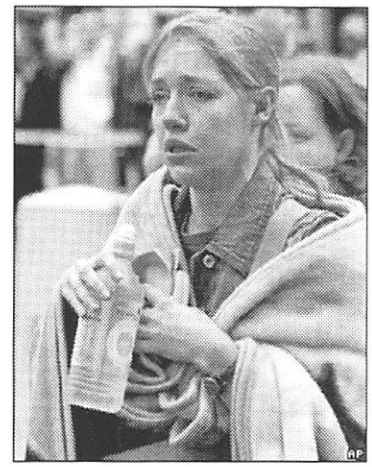
Respuesta Inmediata al Tren Urbano TTX

Friday, August 12, 8:55 a.m.

While response efforts are ongoing in the Rio Piedras station, two emergency medical technicians (EMTs) treating a female victim on the platform near the entrance of the northbound tunnel become ill with headache, throat and eye irritation, and chest pain. The victim's condition worsens, as she has increased difficulty breathing. Other exposed personnel and victims also begin having the same symptoms. Firefighters wearing protective breathing apparatus pull the victims from the area. A quick sweep reveals a clear liquid leaking from a large glass container concealed in a backpack. The firefighters estimate that the capacity of the container is five gallons, and that most of the liquid has spilled from it.

Friday, August 12, 8:58 a.m.

Victims from the Universidad station report to an EMT and other first responders that they have burning pain in their eyes and throats and have difficulty breathing. Those who traveled through the emergency stairway appear to be particularly affected. A policeman on the platform of the station near the northbound tunnel entrance begins to cough violently, and collapses in pain. Firefighters with protective breathing apparatus extricate the policeman, and later find another large glass container concealed in a backpack, which is also leaking a clear liquid. The backpack was hidden just under the stairwell by the tunnel entrance and the emergency exit; it also concealed a five-gallon container.



Summary of Casualties

Rio Pedras:

Deceased 0
Seriously injured 20
Minor injuries 67
Hospitalized 0
Treated and released 0
Estimated contaminated 89
Responders affected 5
Decontaminated 0
Unattended victims 307

Universidad:

Deceased 3
Seriously injured 37
Minor injuries 89
Hospitalized 0
Treated and released 0
Estimated contaminated 73
Responders affected 8
Decontaminated 0
Unattended victims 379

Tunnel:

Deceased 238
Seriously injured 311
Minor injuries 293
Hospitalized 0
Treated and released 0
Estimated contaminated .....Unknown
Responders affected 0
Decontaminated 0
Unattended victims 842

Module 2 — Questions

Review the following questions in their entirety, then discuss the group's major concerns at this point in the exercise scenario. Participants are not required to address every question in this section.

Incident/Unified Command System

1. Who will establish incident command and control the incident scenes? Where would the incident command post(s) be located?

2. Do current plans and procedures give the incident commander(s) sufficient authorization and delegations to deal with this incident?

3. What policies and procedures does your agency have in place to deal with this incident?

4. When would a unified command be established?

5. What agencies should be part of the unified command? Who from your agency would be part of the unified command?

6. Where would the unified command be located?

7. What steps should be taken in the incident planning process? Would the incident plan be written or oral?

8. What assessment of the incident can you make at this point and what objectives should be established accordingly?

9. What is an appropriate strategy to achieve those objectives?

10. What resources and personnel are available to meet the objectives and carry out the strategy?

11. What additional resources would be needed and how could they be obtained and integrated into the response (e.g., mutual aid agreements, requests for Federal and State assistance)? Are sufficient contract authorizations in place?

12. What procedures and processes are in place for the transfer of information internally and externally? Do responding agencies have compatible communications equipment? Are there plans for the use of all available radio frequencies and other communication resources?

ATI

1. What are your policies and procedures to deal with the situation at this point?

2. What actions are you taking with respect to the rest of Tren Urbano? What other stations have or will you shut down? How do you determine which stations should be shut down, or do you bring the entire system to a halt?

3. What is going on in the OCC and the EOC, and how will this affect the response of other agencies? How do the OCC and EOC interact with other EOCs?

4. How is ATI interfacing with other responding agencies? Do compatible communications exist?

Fire/HazMat/EMS/Rescue

1. What will the primary means of communication be within the incident area, and with others outside the area? Do compatible communications exist?

2. Do you have a sufficient number of trained and equipped HazMat personnel to respond to this incident? From where will you get HazMat teams?

3. What decontamination process will be established at the incident site? Where will the decontamination site be located? How will you contain victims until proper decontamination procedures have been followed?

4. What local capabilities exist to identify chemical agents? How will you confirm the specific type of hazardous material involved in this incident?

5. How will surrounding hospitals be notified? Who will make that notification? What information should be relayed to the hospitals?

Law Enforcement

1. What will be the primary means of communication within the incident area? Do compatible communications exist?

2. What will be the overall role at this point for law enforcement personnel?

3. What types of personal protective equipment (PPE) does your agency have for dealing with a chemical incident?

4. How large of a perimeter will you establish and how will you control it? Where are your entry and exit points established?

5. How would you determine whether there are any secondary IEDs or chemical devices at the scene or other Tren Urbano stations and trains, or anywhere else? What resources are available to conduct searches? How would additional resources be procured?

6. What notifications will have been made thus far, and from where do you request additional police presence?

7. What limitations will be placed on the actions of law enforcement personnel because of the suspected hazardous material?

8. How will the crowd near the stations be controlled? Will law enforcement be able to contain the spectators?

9. From a law enforcement perspective, who classifies this incident as a terrorist act? What criteria are used to make this determination? Once this classification is made, what impact is there on local police procedures?

Medical Community/Public Health

1. Not including the media coverage, how would you be notified of such an incident?

2. What actions, if any, would you take at this time?

3. What support might public health request at this time? What resources might be requested?

4. Who makes the decision to call in additional resources?

5. Will an incident command structure be put into place at this time? How are all responsible parties notified?

Emergency Management/City Officials/Public Information

1. At what point will the EOC be activated? How will this decision be made? What information is critical to your decision-making process?

2. Is there a backup or alternative communications capability in case there is a communications system overload?

3. Are alternative personnel designated to fill positions if regular representatives are unable to arrive? How are personnel notified?

4. Who determines resource requirements? How will coordination be affected? What additional resources would be requested from the Federal Government and the National Guard? How would the possibility of other IEDs and chemical devices affect your resource allocation?

5. What protocols exist to deal with the media and public panic? At what point should the public be notified?

6. How will access to the EOC be controlled?

7. How will the affected municipalities coordinate communications with the EOC?

8. What mechanisms are in place to facilitate contact with the University of Puerto Rico regarding the student population in the area? What measures will be taken in regard to other special needs populations in the vicinity of the affected sites?

9. Not including media coverage, how are the public information officers (PIOs) notified?

10. What actions will occur to handle immediate inquiries?

11. What local media outlets will be contacted?

12. Will the use of the Emergency Alert System be considered at this time?

13. What kind of updates will be provided at this time? Who is the main point of contact for the media? Is there another designated person?

14. Is there a call center for incoming calls? What kind of information will be provided?

15. Who will authorize a public service announcement? How will this be broadcast to the citizens? Are there predetermined channels?

16. At what point will the joint information center (JIC) be established? Where will it be?

Federal and State

1. How and at what point in this incident would your agency be informed of events? Would your agency become an active participant in the response, and if so, when?

2. What are your agency's top priorities at this point?

3. Do policies exist within your agency to determine proper procedures for managing such an event? Who would be notified and what are their responsibilities?

4. If applicable to your agency's expected duties at this point, is the appropriate PPE available?

5. Who should be involved in decisionmaking within your agency at this point?

6. Do any protocols exist to deal with the media and public panic at this point?

MODULE 3 – RESPONSE

Friday, August 12, 9:00 a.m.

The incident commander onscene at the Universidad station radios that there is a suspected hazardous material at the scene, and requests that HazMat and Environmental Quality Board (EQB) resources be deployed to the scene. The same request is received from the incident commander at Rio Piedras. Rescue efforts are halted.

Friday, August 12, 9:05 a.m.

Traffic has become heavily congested in and around the stations, hindering the arrival of additional response units.

Friday, August 12, 9:15 a.m.

Calls from passengers trapped in the cars continue to come in, but have decreased considerably. However, 34 passengers have managed to open the emergency release on the train cars and have made their way out of the tunnel to the Rio Piedras station. Many of them are badly injured and burned. As they attempt to climb up onto the platform, they come into contact with a hazardous substance leaking from the backpack.

Meanwhile, local radio and television stations begin broadcasting news that some first responders at the stations have been injured, apparently by some sort of chemical release. No further details are given.

Friday, August 12, 9:17 a.m.

An elderly victim on the platform at Rio Piedras goes into cardiac arrest and dies as a result of breathing complications.

Friday, August 12, 9:18 a.m.

The Federal Bureau of Investigation (FBI) arrives at Rio Piedras and speaks with the incident commander.

Friday, August 12, 2005 9:19 a.m.

The Governor contacts the State EOC and requests a situation update.

Respuesta Inmediata al Tren Urbano TTX

Friday, August 12, 9:30 a.m.

HazMat units arrive at Universidad.

Meanwhile, residents in the vicinity of the attack begin calling the emergency number. They are asking what they should do. Some are extremely panicked and wondering whether they should evacuate their residences. Others are asking if they should tape up their windows and how best to protect their pets.

Friday, August 12, 9:39 a.m.

HazMat units arrive at Rio Piedras.

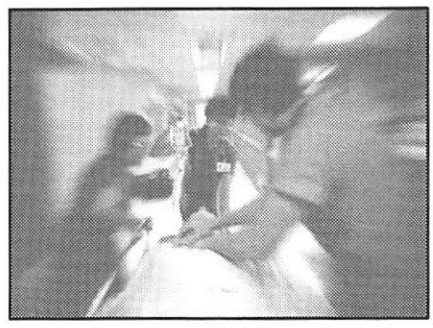
Friday, August 12, 9:43 a.m.

There is a breaking news alert on Telemundo. The report is an update on the earlier reports of the injured first responders. It is announced that Tren Urbano has been the target of a sarin gas attack, like the one on the Tokyo subway in 1995.

Friday, August 12, 9:48 a.m.

HazMat units report that initial pH paper tests at both of the incident scenes indicate that leaking containers contained an acid.

Friday, August 12, 10:06 a.m.



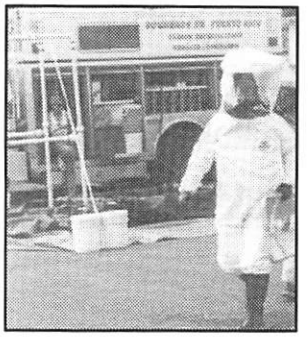
In addition to the massive influx of victims from the incident scenes at the Universidad and Rio Piedras stations, Centro Medico and other local hospitals and clinics witness a rush of citizens who are afraid that they may have been exposed to sarin. The public concern has resulted in additional traffic jams, especially around the impacted area, hampering the deployment of additional resources. There is concern that self-admitting patients may be contaminating the hospitals. Resources at a number of hospitals are becoming strained, and they are requesting assistance.

Friday, August 12, 10:10 a.m.

EQB tests and analyses conclude that the acidic substance is sulfuric acid.

Respuesta Inmediata al Tren Urbano TTX

Friday, August 12, 10:15 a.m.



The incident commander at the Universidad station reports that firefighters have established decontamination, but that it is proceeding slowly. The hazard continues to hinder the response to the trapped passengers in the burning trains in the tunnel. Additional resources are requested to help with the decontamination efforts. The incident commander at Rio Piedras makes the same request.

Friday, August 12, 10:24 a.m.

A representative from Tren Urbano raises concerns that the ongoing fire and intense heat inside the tunnel may create structural damage that could pose a serious additional hazard to the trapped passengers and response personnel. The flames have already severed the communications cable running through the tunnel.

Casualty Summary

Rio Pedras:

Deceased	1
Seriously injured	52
Minor injuries	31
Hospitalized	60
Treated and released	28
Estimated contaminated	143
Responders affected	9
Decontaminated	95
Unattended victims	103

Universidad:

Deceased	3
Seriously injured	63
Minor injuries	52
Hospitalized	84
Treated and released	41
Estimated contaminated	149
Responders affected	8
Decontaminated	112
Unattended victims	77

Tunnel:

Deceased	357
Seriously injured	320
Minor injuries	131
Hospitalized	0
Treated and released	0
Estimated contaminated	Unknown
Responders affected	0
Decontaminated	0
Unattended victims	808

Module 3 — Questions

Review the following questions in their entirety, then discuss the group's major concerns at this point in the exercise scenario. Participants are not required to address every question in this section.

Incident/Unified Command System

1. What consideration, if any, should be given to a transfer of command?
2. How do you plan to track assigned resources and assess the availability of additional resources?
3. What processes are in place to ensure the collecting, relaying, and synthesizing of information from the incident scene, including tracking the status of resources, in order to have an effective evaluation of response efforts?
4. How will the objectives and strategy have changed by this point, if at all?

ATI

1. What actions will you take in response to the presence of sulfuric acid? What ramifications should you consider if you shut down the ventilation systems at Rio Piedras and Universidad? How could this affect rescue operations?
2. How are you coordinating answers to inquiries from the media and private citizens with other responding agencies?
3. What concerns do you have regarding the ongoing fire in the tunnel between the Rio Piedras and Universidad stations?
4. What notifications will you have sent out at this point, and to what Federal, State, or local entities?

Fire/HazMat/EMS/Rescue

1. Once a chemical agent is identified, how will this information be passed on to other agencies?
2. Given the new information, will treatment of victims change? If so, how?
3. Are sufficient assets (e.g., PPE and personnel) available to sustain operations?
4. What process will you establish to ensure decontamination of response personnel and equipment, as they are being rotated or released?
5. What is your agency's involvement in coordinating or executing control of access to the affected area? Who is in charge of entry to the "hot zone"?

6. How will you address the potential contamination of others by victims who have left the immediate incident scene?

7. What concerns are being given to the structural safety of the tunnel, and how will they be addressed?

Law Enforcement

1. Who is in charge of the criminal investigation at this point? What procedures are in place to ensure that first responders understand their role with crime scene evidence collection, protection, and preservation?

2. How will coordination with the FBI be conducted so that it can execute its statutorily mandated investigative role?

3. What plans will be employed to control access to the site? Who will be in charge of site access and control? How will you contain victims until decontamination procedures have been followed?

4. How is general chaos in the city being handled? Are there sufficient units available to handle calls outside the affected area? How is traffic around the accident site being handled? Who is rerouting traffic away from the scene, and what are those routes?

5. What are your plans to rotate on-scene emergency responders? What process do you have to ensure proper decontamination of your personnel and equipment as they are being rotated or released?

Medical Community

1. Are there sufficient assets (e.g., PPE, decontamination facilities) available for sustained operations?

2. What procedures are being followed to identify and track casualties in the triage system?

3. What capabilities exist for establishing decontamination stations at area medical facilities? Are hospitals prepared to conduct this function themselves?

4. What counseling support will you consider for patients and first responders? How soon will you begin deploying these assets? Are there sufficient assets available? Who will be handling relatives of dead or injured persons?

5. Have alternate care facilities or casualty collection points been identified? If so, where? Who will manage and staff them?

6. How will extra supplies be obtained?

Emergency Management/County and City Officials/Public Information

1. What specific external assets are required? Who coordinates the request for external assets? What types of Federal and State support will be required during this time period?

2. What concerns are being given to the structural safety of the tunnel, and how will they be addressed?

3. How will you coordinate with the media to ensure that the public remains informed with information that is confirmed and free of rumors? How do you envision the interface between Federal and local public affairs offices?

4. Who has the local authority to direct cancellation of public and private events and the closure of businesses?

5. At this point, who has the ultimate authority inside the EOC? Who is the liaison with the FBI Command Post?

Federal and State

1. Who should be involved in decisionmaking at this point?

2. What concerns are being given to the structural safety of the tunnel and how will they be addressed?

3. What impact will this incident have on other key infrastructure facilities, such as the airport?

4. How do your agencies address concerns regarding secondary contamination?

5. Who will shelter and feed the victims?

6. What issues will arise concerning the number of fatalities and possibly contaminated corpses?

7. How are mental health issues of distraught citizens and victims being addressed?

MODULE 4 – RECOVERY AND REMEDIATION

Friday, August 12, 11:10 a.m.

HazMat teams at both stations report that the sulfuric acid has been rendered safe in order to allow first responders to resume rescue efforts in the tunnel.

Friday, August 12, 1:20 p.m.

Firefighters reach the train and successfully extinguish the blaze. They discover many victims who succumbed to smoke inhalation. None of the passengers in the car in which the bomb was placed survived. Survivors from the adjacent cars are given treatment on the scene, then evacuated. Structural damage to the tunnel turned out to be minimal.

Friday, August 12, 5:30 p.m.

The offices of the governor and mayor receive a briefing on the status of the train and the cleanup of the affected area. A news conference is scheduled for 6:30 p.m.

Friday, August 12, 11:30 p.m.

Fire and EMS first responders have left the scene of the attacks. Law enforcement agencies now coordinate the investigation. The bomb squad later determines that the explosive device was an ammonium fertilizer and fuel oil mix of approximately 40 pounds hidden in a small suitcase. The device was detonated by cell phone.

Summary of Casualties

Rio Piedras:

Deceased	1
Seriously injured	0
Minor injuries	0
Hospitalized	145
Treated and released	129
Estimated contaminated	0
Responders affected	0
Decontaminated	247
Unattended victims	0

Universidad:

Deceased	3
Seriously injured	0
Minor injuries	0
Hospitalized	165
Treated and released	152
Estimated contaminated	0
Responders affected	0
Decontaminated	269
Unattended victims	0

Tunnel:

Deceased	781
Seriously injured	0
Minor injuries	0
Hospitalized	27
Treated and released	0
Estimated contaminated	0
Responders affected	0
Decontaminated	0
Unattended victims	0

Module 4 — Questions

Review the following questions in their entirety, then discuss the group's major concerns at this point in the exercise scenario. Participants are not required to address every question in this section.

Incident/Unified Command System

1. How will the unified command approach the demobilization phase of the incident?
2. What demobilization issues will the EOC consider, and when will the EOC be stood down?
3. How will you determine what resources can be phased out or redirected?
4. What will the JIC's role be in apprising senior officials of the incident? What role will be played in the press conference, if any?

ATI

1. What actions will Tren Urbano take during the recovery and restoration period?
2. How will Tren Urbano coordinate its actions with the authorities conducting the investigation?
3. To what extent can services be resumed, and how will this be communicated to the public?
4. What new security measures do you plan to implement in the wake of this incident?

Fire/HazMat/EMS/Rescue

1. How do current policies and procedures deal with protecting evidence at the incident scene?

Law Enforcement

1. What measures are in place to ensure that the information in Module 1 is incorporated into the investigation?
2. How will you coordinate with the FBI?
3. What issues, investigative and forensic, will arise with the bodies at the scene and what relevant policies are in place?

Medical Community

1. How will the medical community deal with the ongoing resource issues related to the treatment and care of victims from the incident, and what additional resources may be required? How will they be obtained?

Federal and State Agencies

1. What additional assistance should Federal and State entities be expected to provide as the incident enters the demobilization phase?

APPENDIX A
AGENT SUMMARY: SULFURIC ACID

Summary

Sulfuric acid, H2SO4, is a strong mineral acid (not an organic acid). It can form any concentration in water. The old name for sulfuric acid is oil of vitriol. When high concentrations of SO3 are added in making the acid, a solution of SO3 in H2SO4 results. This is called fuming sulfuric acid, Oleum, or Nordhausen acid.

Sulfuric acid has many applications, including in many chemical reactions and production processes. It is the most widely used chemical. Principal uses include fertilizer manufacturing, ore processing, chemical synthesis, wastewater processing, and oil refining.

In combination with nitric acid, it forms the nitronium ion, which is used in the nitration of compounds. The process of nitration is used to manufacture many explosives, including trinitrotoluene, nitroglycerine, and guncotton. It is also the acid used in lead-acid batteries, and is sometimes known as battery acid.

The hydration reaction of sulfuric acid is highly exothermic. If water is added to concentrated sulfuric acid, it can boil. Always add the acid to the water rather than the water to the acid. Note that part of this problem is because of the relative densities of the two liquids. Water is less dense than sulfuric acid and will tend to float above the acid.

Because the hydration of sulfuric acid is thermodynamically favorable, sulfuric acid is an excellent dehydration agent, and is used to prepare many dried fruits.

The affinity of sulfuric acid for water is sufficiently strong that it will take hydrogen and oxygen molecules out of other compounds; for example, mixing glucose (C6H12O6) and concentrated sulfuric acid will result in elemental carbon and water, which is absorbed by the sulfuric acid (which becomes slightly diluted): C6H12O6 --> 6C + 6H2O.

When in the atmosphere, it is part of many chemicals that make up acid rain.

Public Health Effects

Inhalation: Corrosive. Effects should be less severe than from exposure to higher concentrations of sulfuric acid. Symptoms may include irritation of the nose and throat, labored breathing, lung edema, and damage to the mucous membranes and upper respiratory tract.

Ingestion: Corrosive. Effects should be less severe than from exposure to higher concentrations of sulfuric acid. Symptoms may include severe burns of the mouth, throat, and stomach. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow ingestion or skin contact. Circulatory shock is often the immediate cause of death. May cause sore throat, vomiting, diarrhea.

Skin Contact: Corrosive. Effects should be less severe than from exposure to higher concentrations of sulfuric acid. Symptoms may include redness, pain, and burns to the skin. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow ingestion or skin contact. Circulatory shock is often the immediate cause of death.

Eye Contact: Corrosive. Effects should be less severe than from exposure to higher concentrations of sulfuric acid. Symptoms may include blurred vision, redness, pain, and burns to eye tissue. Concentrated solutions can cause blindness.

Chronic Exposure: Long-term exposure to mist or vapors may cause damage to teeth. Chronic exposure to mists containing sulfuric acid is a cancer hazard.

Aggravation of Pre-Existing Conditions: Persons with pre-existing skin disorders, eye problems, or impaired respiratory function may be more susceptible to the effects of the substance.

First Aid Measures

First aid procedures given apply to concentrated solutions. Exposures to diluted solutions may not require these extensive first aid procedures.

Inhalation: Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.

Ingestion: DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Excess acid on skin can be neutralized with a 2 percent solution of bicarbonate of soda. Call a physician immediately.

Eye Contact: Immediately flush eyes with a gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Call a physician immediately.

APPENDIX B
ACRONYMS AND ABBREVIATIONS

AAR	After-Action Report
ACDC	Acute Communicable Disease Control
ALS	Advanced Life Support
ARAC	Atmospheric Release Advisory Capability
ARDS	Adult Respiratory Distress Syndrome
ATSDR	Agency for Toxic Substances and Disease Registry
BAL	British Anti-Lewisite (dimercaprol)
BATF	Bureau of Alcohol, Tobacco, Firearms and Explosives
BLS	Basic Life Support
BNICE	Biological, Nuclear, Incendiary, Chemical, Explosive
BW	Biological Warfare
C2	Command and Control
CAT	Crisis Action Team
C/B	Chemical and/or Biological
CBIRF	Chemical/Biological Incident Response Force
CBRDT	Chemical/Biological Rapid Deployment Team
CBRN	Chemical, Biological, Radiological, and Nuclear
C/B-RRT	Chemical/Biological Rapid Response Team
CBW	Chemical and Biological Weapons
CDC	Centers for Disease Control and Prevention
CDRG	Catastrophic Disaster Response Group
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CIRG	Critical Incident Response Group
CISD	Critical Incident Stress Debriefing
CISM	Critical Incident Stress Management
CP	Command Post
CRTF	Commander, Response Task Force
CST	Civil Support Team
DAC	Disaster Application Center
DALO	Disaster Area Liaison Officer

DART	Disaster Assessment and Recovery Team
DCE	Disaster Coordinating Element
DCO	Defense Coordinating Officer
DEM	Department of Emergency Management
DEP	Department of Environmental Protection
DEQ	Department of Environmental Quality
DEST	Domestic Emergency Support Team
DFO	Disaster Field Office
DHHS	Department of Health and Human Services
DHS	Department of Homeland Security
DHS	Department of Health Services
DMAT	Disaster Medical Assistance Team
DMORT	Disaster Mortuary Operational Response Team
DNR	Department of Natural Resources
DoD	Department of Defense
DOE	Department of Energy
DOH	Department of Health
DOJ	Department of Justice
DOMS	Director of Military Support
DOS	Department of State
DOT	Department of Transportation
DPIE	Decontaminating Packet, Individual Equipment (M258)
DPP	Domestic Preparedness Program
DPS	Department of Public Safety
DPW	Department of Public Works
DRTF	Disaster Relief Task Force
DSR	Damage Survey Report
DTRG	DoD Technical Response Group
DWI	Disaster Welfare Inquiry
EAS	Emergency Alert System
EBS	Emergency Broadcast System
ECT	Effective Cumulative Dose
EDT	Explosive Device Team
EIS	Epidemiological Intelligence Service
EMA	Emergency Management Agency
EMS	Emergency Medical Service(s)
EMT	Emergency Medical Technician

EOC	Emergency Operations Center
EOD	Explosive Ordnance Disposal
EOP	Emergency Operations Plan
EPA	Environmental Protection Agency
ERT	Emergency Response Team
ERT-A	Emergency Response Team – Advance Element
ERT-N	Emergency Response Team – National Element
ESD	Emergency Services Director
ESF	Emergency Support Function
EST	Emergency Support Team
FAA	Federal Aviation Administration
FAST	Federal Assessment Team
FBI	Federal Bureau of Investigation
FCA	Fatalities Collection Area
FCO	Federal Coordinating Officer
FEMA	Federal Emergency Management Agency
FRP	Federal Response Plan
GIS	Geographic Information System
GSA	General Services Administration
HazMat	Hazardous Materials
HIT	Hazardous Incident Team
HMIT	Hazardous Materials Incident Team
HMRU	Hazardous Materials Response Unit (FBI)
HVA	Hazards Vulnerability Analysis
IC	Incident Commander
ICP	Incident Command Post
ICS	Incident Command System
ICU	Intensive Care Unit
ID	Infectious Disease
IED	Improvised Explosive Device
JEPIC	Joint Emergency Public Information Center
JIC	Joint Information Center

JOC	Joint Operations Center
JTF	Joint Task Force
LCt_{50}/LD_{50}	Lethal Concentration 50%/Lethal Dose 50%
LE/LEA	Law Enforcement/Law Enforcement Agency
LFA	Lead Federal Agency
LNO	Liaison Officer
LRN	Laboratory Response Network
MA1	First Alarm Medical Aid
MAC	Medical Alert Center
MACC	Multi-Agency Coordination Center
MACDIS	Military Assistance for Civil Disturbances
MATF	Multi-Agency Task Force
MCI	Mass Casualty Incident
MCIP	Mass Casualty Incident Plan
ME	Medical Examiner
MEDEVAC	Medical Evacuation
MERGE	Mobile Emergency Response Group and Equipment
MERS	Mobile Emergency Response System
MMRS	Metropolitan Medical Response System
MMST	Metropolitan Medical Strike Team
MOPP	Mission-Oriented Protective Posture
MOU	Memorandum of Understanding
MSCA	Military Support to Civil Authorities
MSDS	Material Safety Data Sheet
MSU	Management Support Unit
NAWAS	National Warning System
NBC	Nuclear, Biological, and/or Chemical
NCA	National Command Authority
NCEH	National Center for Environmental Health
NCID	National Center for Infectious Diseases
NCP	National Contingency Plan
NCS	National Communications System
NDMS	National Disaster Medical System
NDPC	National Domestic Preparedness Consortium
NDPO	National Domestic Preparedness Office

NG	National Guard
NIH	National Institutes of Health
NIOSH	National Institute of Occupational Safety and Health
NMRI	Naval Medical Research Institute
NMRT	National Medical Response Team
NPSP	National Pharmaceutical Stockpile Program
NRT	National Response Team
OCC	Operations Control Center
ODP	Office for Domestic Preparedness
OEM	Office of Emergency Management
OEP	Office of Emergency Preparedness
OES	Office of Emergency Services
OIS	Officer-in-Charge
OJP	Office of Justice Programs
OPS	Operations
OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Administration
PAO	Public Affairs Officer
PDA	Preliminary Damage Assessment
PDD	Presidential Decision Directive
PFO	Principal Federal Official
PHS	Public Health Service
PIO	Public Information Officer
POC	Point of Contact
POD	Point of Distribution
PPE	Personal Protective Equipment
PREMA	Puerto Rico Emergency Management Agency
PSA	Public Service Announcement
RCC	Recovery Coordination Center
RRT	Regional Response Team
ROC	Regional Operations Center
RRT	Rapid Response Team
RTF	Response Task Force

SABA	Supplied-Air Breathing Apparatus
SAC	Special Agent-in-Charge (FBI)
SBCCOM	Soldier and Biological Chemical Command (U.S. Army)
SCBA	Self-Contained Breathing Apparatus
SCO	State Coordinating Officer
SERT	State Emergency Response Team
SIOC	Strategic Information and Operations Center
SITMAN	Situation Manual
SITREP	Situation Report
SOC	State Operations Center
SOG	Special Operations Group (FBI)
SOG	Standard Operation Guidelines
SOP	Standard Operating Procedure
SWAT	Special Weapons and Tactics
TEU	Technical Escort Unit
TEW	Terrorism Early Warning (Group)
TTX	Tabletop Exercise
TWG	Terrorism Working Group
UCS	Unified Command System
USACE	U.S. Army Corps of Engineers
USAMRICD	U.S. Army Medical Research Institute of Chemical Defense
USAMRIID	U.S. Army Medical Research Institute of Infectious Diseases
USAR	Urban Search and Rescue
USDA	U.S. Department of Agriculture
USPHS	U.S. Public Health Service
VA	Department of Veterans Affairs
VOAD	Volunteer Organizations Active in Disaster
WBC	White Blood Count
WHO	World Health Organization
WMD	Weapons of Mass Destruction
WMDOU	Weapons of Mass Destruction Operations Unit (FBI)

APPENDIX C
INTERNET REFERENCE LINKS

Federal Government

Agency for Toxic Substances and Disease Registry - www.atsdr.cdc.gov/

Bureau of Justice Assistance - www.ojp.usdoj.gov/BJA

Center for Defense Information - Terrorism Project - www.cdi.org/terrorism

Critical Infrastructure Assurance Office - www.ciao.gov/

Central Intelligence Agency - www.cia.gov/

Defense Link - www.defenselink.mil/

Department of Homeland Security - www.dhs.gov/dhspublic/

Department of State – Counter terrorism Office - www.state.gov/s/ct/

Department of State – Response to Terrorism - http://usinfo.state.gov/topical/pol/terror/

Environmental Protection Agency - www.epa.gov

Federal Bureau of Investigation - www.fbi.gov/

Federal Research Division (Library of Congress) - Terrorism Studies - http://lcweb.loc.gov/rr/frd/terrorism.html

Government Counter-Terrorism - www.counterterrorismtraining.gov/

National Infrastructure Protection Center - www.nipc.gov/

National Institute of Justice - www.ojp.usdoj.gov/nij

Office of Justice Programs - www.ojp.usdoj.gov

Office for Victims of Crime - www.ojp.usdoj.gov/ovc/

Overseas Security Advisory Council - www.ds-osac.org

Ready.Gov - www.ready.gov/

Technical Support Working Group - www.tswg.gov/

United Nations Action Against Terrorism - www.un.org/terrorism/

U.S. Army Soldier and Biological Chemical Command - www.sbccom.apgea.army.mil/

U.S. Commission on National Security - www.nssg.gov/

U.S. Department of Energy - www.energy.gov

U.S. Department of State Bureau of Diplomatic Security - www.state.gov/m/ds

U.S. Department of Transportation: Transportation Security Administration - www.tsa.gov

U.S. Food and Drug Administration Bioterrorism Information - www.fda.gov/oc/opacom/hottopics/bioterrorism.html

Associations

American Hospital Association - www.aha.org

Association for Professionals in Infection Control and Epidemiology - www.apic.org/

Association of State and Territorial Health Officials - www.astho.org

Disaster Preparedness and Emergency Response Association - www.disasters.org/dera/dera.htm

International Association of Chiefs of Police - www.theiacp.org/

International Association of Emergency Managers - www.iaem.com

International Association of Fire Chiefs - www.ichiefs.org/

National Association of County and City Health Officials - www.naccho.org

National Association of Emergency Medical Technicians - www.naemt.org/

National Association of Local Boards of Health - www.nalboh.org/

National Association for Search and Rescue - www.nasar.org/

National Emergency Management Association - www.nemaweb.org/index.cfm

National institute for Urban Search and Rescue - www.niusr.org/

National Sheriffs' Association - www.sheriffs.org/

Preparedness/Consequence Management Information

Agency for Toxic Substances and Disease Registry - www.atsdr.cdc.gov/

Air Force Counter proliferation Center - www.au.af.mil/au/awc/awcgate/awc-cps.htm

Armed Forces Radiobiology Research Institute - www.afrri.usuhs.mil/

Anthrax Vaccine Immunization Program - www.anthrax.osd.mil/

Centers for Disease Control Emergency Preparedness and Response Information - www.bt.cdc.gov/

Centers for Disease Control International Conference on Emerging Infectious Diseases - www.cdc.gov/ICEID/

Center for Domestic Preparedness - www.ojp.usdoj.gov/odp/docs/fs-cdp.htm

Center for Infectious Disease Research and Policy at the University of Minnesota - www.cidrap.umn.edu/

Chembio.com - www.chem-bio.com/

Chemical Emergency Preparedness and Prevention - http://yosemite.epa.gov/oswer/ceppoweb.nsf/content/index.html

Chemical Stockpile Emergency Preparedness Program - www.csepp.apgea.army.mil/

Community Research Associates - www.community-research.com

Consequence Management Interoperability Services - www.cmi-services.org/default.asp

Crisis Management International - http://cmiatl.com/

Department of Agriculture Emergency Planning and Response Activities - www.usda.gov/da/ocpm/emergency.htm

Disaster and Emergency Management Information Network - http://ppri.tamu.edu/homeland_security/index_home.html

DomesticPreparedness.com - www.domesticpreparedness.com/

Edgewood Chemical Biological Center - www.edgewood.army.mil

Office of Critical Infrastructure Protection and Emergency Preparedness - www.epc-pcc.gc.ca/

Epidemiologic Information on Bioterrorism - www.ph.ucla.edu/epi/bioter/bioterrorism.html

Federal Emergency Management Agency - www.fema.gov/

Guidance for Radiation Accident Management - www.orau.gov/reacts/guidance.htm

Bioterrorism - www.osha.gov/SLTC/biologicalagents/bioterrorism.html

Managing Hazardous Material Incidents - www.atsdr.cdc.gov/mhmi.html

The National Academies: Responding First to Bioterrorism - www.nap.edu/firstresponders/

Natural Hazards Center at the University of Colorado, Boulder - www.colorado.edu/hazards/

New Zealand Ministry of Civil Defense and Emergency Management - www.mcdem.govt.nz/memwebsite.nsf

Nonproliferation, Arms Control, and International Security Counter terrorism and Incident Response - www.llnl.gov/nai/rdiv/rdiv.html

Office for Domestic Preparedness - www.ojp.usdoj.gov/odp/

National Disaster Medical System - http://ndms.dhhs.gov/

Oklahoma Department of Civil Emergency Management - www.odcem.state.ok.us/

Terrorism - Preparing for the Unexpected - www.redcross.org/services/disaster/keepsafe/unexpected.html

United States Army Medical Research Institute of Chemical Defense - http://chemdef.apgea.army.mil/

United States Army Medical Research Institute of Infectious Diseases - www.usamriid.army.mil/

Relief Organizations

Aircraft Casualty Emotional Support Services - www.accesshelp.org/

American Red Cross - www.redcross.org/

The ANSER Institute for Homeland Security - www.homelandsecurity.org/

Disaster Relief - www.disasterrelief.org/

International Critical Incident Stress Foundation, Inc. - www.icisf.org/

National Voluntary Organizations Active in Disasters - www.nvoad.org/

Salvation Army – www1.salvationarmy.org/

Training Information

Academy of Counter-Terrorist Education - www.ojp.usdoj.gov/odp/docs/fs-lsu.htm

Bureau of Alcohol, Tobacco, Firearms and Explosives – Arson and Explosives Training - www.atf.treas.gov/explarson/explarson_trng.htm

The Center for Preparedness and Training - www.preparedness-center.com/

Department of Energy/International Association of Fire Fighters Training for Radiant Emergencies - http://tis.eh.doe.gov/fire/fro/fro.html

Domestic Preparedness Campus Online Training Facility - www.teexwmdcampus.com/

Early Responders Distance Learning Center - http://erdlc.sju.edu/

ERI International - www.eri-intl.com/

Federal Law Enforcement Training Center Training Programs - www.fletc.gov/trng.htm

FEMA's Emergency Education Network - http://training.fema.gov/emiweb/eenet/

Hands-On CAMEO (Computer-Aided Management of Emergency Operations) Training - www.hsph.harvard.edu/ccpe/programs/CAMEO.shtml

HAZ/MAT DQE, Inc. - www.hazmatdqe.com/

Homeland Defense - http://hld.sbccom.army.mil/

International Emergency Technical Rescue Institute - www.fire.org.uk/IETRI/GPDEdisplay.php

Law Enforcement, Emergency Management, and Corrections Training Resources - www.lectr.org/

Maryland Fire and Rescue Institute - www.mfri.org/

National Domestic Preparedness Consortium - www.emrtc.nmt.edu/events/ndpc/

National Emergency Response and Rescue Training Center - http://teexweb.tamu.edu/nerrtc/

National Interagency Civil-Military Institute - www.nici.org/

National Terrorism Preparedness Institute - http://terrorism.spjc.edu/

New York City Fire Department - Fire Academy - www.nyc.gov/html/fdny/html/units/fire_academy/fa_index.shtml

Planned Response Exercises and Emergency Medical Preparedness Training - http://home.eznet.net/~kenberry/

The University of Findlay Center for Terrorism Preparedness - http://seem.findlay.edu/terrorism

Chemical/Biological

Agency for Toxic Substances and Disease Registry - www.atsdr.cdc.gov/

American Academy of Dermatology - www.aad.org/

American Anthrax Outbreak of 2001 - www.ph.ucla.edu/epi/bioter/detect/antdetect_intro.html

American College of Emergency Physicians - www.acep.org/1,4634.0.html

Armed Forces Radiobiology Research Institute - www.afrri.usuhs.mil/

Biological Weapons for Waging Economic Warfare - www.airpower.maxwell.af.mil/airchronicles/battle/chp10.html

Bioterrorism and Immune Building Technology - www.bio.psu.edu/people/faculty/whittam/research/bw.htm

Bioterrrorism Learning Center - http://bioterrorism.digiscript.com/

Center for Defense Information – Chem-Bio Weapons - www.cdi.org/issues/cbw/factsheet.html

Center for Terrorism Preparedness - Findlay University - http://seem.findlay.edu/terrorism

Centers for Disease Control - www.cdc.gov/

Chemical and Biological Arms Control Institute - www.cbaci.org/

Chemical and Biological Defense Information Analysis Center - www.cbiac.apgea.army.mil/

Defending Against Invisible Killers - www.defenselink.mil/specials/chembio/index.html

Emergency.com – HazMat Operations Archive - www.emergency.com/hzmtpage.htm

Epidemiologic Information on Bioterrorism - www.ph.ucla.edu/epi/bioter/bioterrorism.html

Frequently Asked Questions: Personal Protection & Chemical or Biological Terrorism - www.stimson.org/cbw/?SN=CB20011220140

Harvard Sussex Program/University of Sussex in United Kingdom - www.sussex.ac.uk/spru/hsp

History of Bioterrorism - www.bioterry.com/History_of_Biological_Terrorism.asp

Johns Hopkins University - www.hopkins-biodefense.org/

Joint SIPRI-Bradford Chemical and Biological Warfare Project - http://projects.sipri.se/cbw/cbw-sipri-bradford.html

Medical Chemical and Biological Defense Research Program - http://medchembio.detrick.army.mil/

Monterey Institute of International Studies – Chemical and Biological Weapons Page - http://cns.miis.edu/research/cbw/

Medical NBC Online Information Server - www.nbc-med.org/ie40/Default.html

Nerve Agents - http://faculty.washington.edu/chudler/weap.html

NOVA: Bioterror - www.pbs.org/wgbh/nova/bioterror/

PigHealth - www.pighealth.com/

Plague War - www.pbs.org/wgbh/pages/frontline/shows/plague/

Protecting Emergency Responders - Lessons Learned from Terrorist Attacks - www.rand.org/publications/CF/CF176/

Smallpox 2002: Silent Weapon - www.bbc.co.uk/drama/smallpox2002/

St. Louis University School of Public Health - www.slu.edu/colleges/sph/bioterrorism/

Texas Department of Health/Bioterrorism Links - www.tdh.state.tx.us/stateepi/anthrax.htm

The Arms Control and Disarmament Agency - http://dosfan.lib.uic.edu/acda/

The Chemical and Biological Weapons and WMD Terrorism News Archive - www.nti.org/db/cbw/

The Federation of American Scientists Chemical and Biological Arms Control Program - http://fas.org/bwc/

The Global Emerging Infections System - www.geis.ha.osd.mil/

The Henry L. Stimson Center, Chemical and Biological Weapons Nonproliferation Project - www.stimson.org/cbw/?SN=CB2001112951

The History of Chemical Weapons - www.geocities.com/CapeCanaveral/Lab/4239/chemweapons/cwindex.html

The National Institute of Allergy and Infectious Diseases - www.niaid.nih.gov/

The Office of Hazardous Materials Safety - http://hazmat.dot.gov/

Anthrax Vaccine Immunization Program - www.anthrax.osd.mil/

The Pharmaceutical Research and Manufacturers of America - http://srpub.phrma.org/weapons.html

The TAO of CBW - www.nervegas.com/

The U.S. Army Medical Research Institute of Infectious Diseases - www.usamriid.army.mil/

The Virtual Bioscience and Biotechnology Center - www.martindalecenter.com/GradBioscience/html

University of Alabama at Birmingham Center for Emergency Care and Disaster Preparedness - www.uab.edu/cdp

University of Bradford/Peace Studies - www.brad.ac.uk/acad/sbtwc/

U.S. Army Medical Research Institute of Chemical Defense - http://chemdef.apgea.army.mil/

U.S. State Department/Archive Prior to 2001 -
www.state.gov/www/global/arms/treaties/bwc1.html

World Health Organization – Preparedness for Deliberate Epidemics -
www.who.int/emc/deliberate_epi.htm

APPENDIX D
GLOSSARY

Term	Definition
Absorption	The process of an agent being taken in by a surface (e.g., clothing, fabrics, wood, etc.), much like a sponge and water.
Aerobe	A microorganism that lives and grows in the presence of free oxygen.
Aerosol	Fine liquid or solid particles suspended in air; for example, fog or smoke.
Agent Dosage	Refers to the LD_{50}—the amount of a given agent that is lethal, in one dose, for 50 percent of test animals. The lower the LD_{50}, the less amount of agent is required for lethality, and thus more potent the agent.
Anaerobe	A microorganism that lives and grows in the complete or almost compete absence of oxygen. An example is *Clostridium botulinum*.
Antibiotic	A chemical substance that inhibits the growth of or kills microorganisms. Antibiotics can be taken prior to or after exposure.
Antidote	A substance that neutralizes toxic agents or their effects.
Antiserum	The liquid part of blood containing antibodies.
Bacteria	Single-celled organisms that multiply by cell division and can cause disease in humans, plants, or animals.
Biochemicals	The chemicals that make up or are produced by living things.
Biological Warfare	The intentional use of biological agents as weapons to kill or injure humans, animals, or plants, or to damage equipment.
Biological Warfare Agents	Living organisms or the chemical compounds derived from them that cause disease or disrupt physiological activity in humans, animals, or plants, or cause deterioration of material. Biological agents may be used as liquid droplets, aerosols, or dry powders.

Term	Definition
Bioregulators	Biochemicals that regulate bodily functions. Bioregulators that are produced by the body are termed "endogenous." Some of these bioregulators can be chemically synthesized.
Causative Agent	The organism or toxin that is responsible for causing a specific disease or harmful effect.
Ceiling Exposure Value	The maximum airborne concentration of a biological or chemical agent to which a worker may legally be exposed at any time.
CNS	Pertaining to the central nervous system.
CNS Depressants	Compounds that have the predominant effect of depressing or blocking the activity of the central nervous system. The primary mental effects include disruption of the ability to think, sedation, and lack of motivation.
CNS Stimulants	Compounds that have the predominant effect of flooding the brain with too much information. The primary mental effect is loss of concentration, causing indecisiveness and the inability to act in a sustained, purposeful manner.
Conjunctivitis	Inflammation and redness in the eye.
Contagious	Refers to the ability of biological agents to be transmitted from one person to another, or from a living disease vector to humans.
Culture	A population of microorganisms grown in a medium.
Cutaneous	Pertaining to the skin.
Decontamination	The process of making any person, object, or area safe by absorbing, destroying, neutralizing, making harmless, or removing the hazardous material.
Endotoxin	A toxin contained in the cell walls of some microorganisms, especially Gram-positive bacteria, that is released when the bacterium dies and is broken down in the body.
Exclusion Zone	The area immediately surrounding a hazardous materials or NBC release or spill. This is the innermost of the three hazardous materials control zones.

Term	Definition
Federal Response Plan	The interdepartmental planning mechanism, developed under the leadership of the Federal Emergency Management Agency, by which the Federal Government prepares for and responds to a disaster.
Gram Stain	The method of staining microorganisms using a violet stain, followed by an iodine solution; decolorizing with an alcohol or acetone solution; and counterstaining with safranin. The retention of either the violet color of the stain or the pink color of the counterstain serves as a primary means of identifying and classifying bacteria.
Hazardous Material	A substance or combination of substances, which, because of quantity, concentration, physical, chemical, radiological, explosive, or infectious characteristics, poses a substantial or potential danger to humans or the environment.
Host	An animal or plant that harbors or nourishes another organism.
IDLH	Concentrations immediately dangerous to life and health.
Infectious Agents	Biological agents capable of reproducing in an infected host.
Infectivity	(1) The ability of an organism to spread, (2) the number of organisms required to cause an infection to secondary hosts, and (3) the capability of an organism to spread out from the site of infection and cause disease in the host organism. Infectivity also can be defined as the number of organisms required to cause an infection.
Level A Protection	The level of protective equipment in situations where the material is considered acutely vapor-toxic to the skin and hazards are unknown. Full encapsulation, airtight chemical suit with self-contained breathing apparatus or supplied-air breathing apparatus.
Level B Protection	The level of protective equipment where the environment is not considered acutely vapor-toxic to skin but may cause respiratory effects. Chemical splash suit or full coverage, non-airtight chemical suit with self-contained breathing apparatus or supplied-air breathing apparatus.
Level C Protection	The level of protective equipment required to prevent respiratory exposure but not possible skin contact. Chemical splash suit with cartridge respirator.

Term	Definition
Level D Protection	The level of protective equipment required when the atmosphere contains no known hazard; when splashes, immersions, inhalation, or contact with hazardous levels of any chemical is precluded. Work uniform such as coveralls, boots, leather gloves, and hardhat.
Lewisite	Lewisite is a vesicant that damages the eyes, skin, and airways by direct contact. After absorption, it causes an increase in capillary permeability to produce hypovolemia, shock, and organ damage. Exposure to lewisite causes immediate pain or irritation, although lesions require hours to become full-blown. Management of a lewisite casualty is similar to management of a mustard casualty, although a specific antidote, British Anti-Lewisite (BAL, dimercaprol), will alleviate some effects.
Methods of Dissemination	Refers to the range of technologies and platforms that are available or that can be produced to deliver biological agents into the atmosphere.
Microorganism	Any of various organisms, such as bacteria, rickettsia, viruses, and certain fungi, that can be seen only with a microscope.
Mitigation	Pre-event planning and actions which aim to lessen the effects of potential disaster.
Organism	Any individual living thing, whether animal or plant.
Parasite	Any organism that lives in or on another organism without providing benefit in return.
Pathogenicity	Reflects the ability of an infectious agent to cause disease in a host once the requisite number of microorganisms penetrate the body to initiate infection. An infectious agent must then multiply to cause disease.
Pathogenic Agent	Biological agent capable of causing serious disease.
Percutaneous Agent	Agent that is able to be absorbed through the body.
Personal Protective Equipment	The equipment and clothing required to shield or isolate personnel from the chemical, physical, and biological hazards that may be encountered at the site of a weapons of mass destruction or hazardous materials incident.

Term	Definition
Prophylaxis	Measures designed to preserve health (as of an individual or of society) and prevent the spread of disease.
Psychosomatic Symptoms	Bodily symptoms caused by mental or emotional disturbance.
Rhinorrhea	A runny nose.
Spore	A reproductive form some microorganisms can take to become resistant to environmental conditions, such as extreme heat or cold, while in a "resting phase."
Stability	Refers to the ability of a biological agent to remain viable either in storage or when released into the atmosphere. A broad range of variables regulates agent stability. In particular, many biological agents are extremely sensitive to environmental pressures, including temperature, atmospheric pollution, humidity, moisture, and ultraviolet radiation.
Standard Operating Procedures	A set of instructions having the force of a directive, covering those features of operations that lend themselves to a definite or standardized procedure.
Terrorism	A violent act or an act dangerous to human life, in violation of the criminal laws of the United States or any segment, to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives (U.S. Department of Justice).
Toxicity	A measure of the harmful effect produced by a given amount of toxin on a living organism. The relative toxicity of an agent can be expressed in milligrams of toxin needed per kilogram of body weight to kill experimental animals.
Transmissibility	Refers to the method of transmission of a particular biological agent.
Triage	Sorting. A technique of establishing rescues, decontamination, treatment, and transportation priorities in any event where the number of casualties overwhelms the resources of the emergency response organization.
Vaccine	A preparation of killed or weakened microorganism products used to artificially induce immunity against a disease.

Term	Definition
Vesicants	A drug or other agent that produces blisters. Vesicants are highly active corrosive materials, even at extremely low concentrations.
Virus	An infectious microorganism that exists as a particle rather than as a complete cell. Particle sizes range from 200 to 400 nanometers (one-billionth of a meter). Viruses are not capable of reproducing outside of a host cell.