

**Plan of Instruction
for
Building Design for Homeland Security
FEMA 426**

Course Numbers E 155, L 155, E 156, L156

Revised August 2007



FEMA

FEDERAL EMERGENCY MANAGEMENT AGENCY

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RATIONALE

The increasing occurrence and threat of terrorist activity in the United States, especially the events of September 11, 2001, resulted in the creation of the Department of Homeland Security (DHS). This was one of the most significant transformations in the Federal Government in decades. The first priority of DHS is to protect the nation against further terrorist attacks.

As part of DHS, the Federal Emergency Management Agency (FEMA) ensures that our nation is prepared for catastrophes – whether natural disasters or terrorist assaults. The Building Sciences Branch of the Risk Reduction Division of the Mitigation Directorate protects lives and prevents the loss of property by promoting building design and technology to mitigate the effects of natural disasters, technological accidents, and terrorism events. One component of the strategy for promoting safe building design is the FEMA Risk Management Series (RMS) of publications for building sciences professionals.

FEMA 426, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings*, was published as part of the FEMA Security Risk Management Series to provide best design practices for protecting buildings from terrorist attacks. Additional publications added to the Series include:

- FEMA 427, *Primer for Design of Commercial Buildings to Mitigate Terrorist Attacks*
- FEMA 430, *Site and Urban Design for Security Guidance Against Potential Terrorist Attack*
- FEMA 452, *Risk Assessment: A How-To Guide to Mitigate Potential Terrorist Attacks Against Buildings*
- FEMA 453, *Design Guidance for Shelters and Safe Rooms*
- FEMA 455, *Handbook for Rapid Visual Screening to Evaluate the Vulnerability of Buildings to Potential Terrorist Attacks*

Training provides an opportunity to introduce these publications to building professionals and a forum for discussion and application of the recommended methods and techniques. This course, *Building Design for Homeland Security*, was developed to provide those opportunities, and has been exceptionally well received by participants. In response to requests from the target audience, course variations have been developed to address differences between urban and suburban settings. An additional version is offered for use by Federal and State agencies and local governments in conducting risk assessment of alternate facilities for Continuity of Operations (COOP).

Course offerings which may include either the Urban Site or Suburban Site option are numbered E155, where E indicates courses conducted on the Emergency Management Institute (EMI) campus, and L155, where L indicates courses conducted off campus.

The COOP versions of the course offerings are numbered E156 and L156. These courses cover the same basic learning objectives as E155 and L155, but are tailored to COOP applications. In addition, E156 and L156 include a “train-the-trainer” unit for participants who will be expected to train others on the job to conduct the risk assessment methodology using FEMA 426 and FEMA 452.

PURPOSE AND COURSE GOAL

The purpose of the course, *Building Design for Homeland Security*, is to introduce and promulgate the use of the FEMA 426 assessment methodology to identify relative risks for various terrorist threats, as a basis for designing sites and buildings to protect people and property against terrorist attacks.

The goal of the course is to enable and encourage building professionals to apply measures and available technology that reduce risk from terrorist attack, using a team approach among security, COOP, and other professionals involved in the design process.

For the COOP offerings which include the “train-the-trainer” unit, an additional goal of the course is to provide skills and knowledge to improve capability to teach others to complete a risk assessment using FEMA 426 and FEMA 452.

COURSE OBJECTIVES

There are three different versions of the *Building Design for Homeland Security* course, one for suburban buildings, one for urban buildings, and one for Continuity of Operations Planning (COOP) sites. Upon completion of any version of this course, participants will be able to:

1. Explain the basic components of an assessment methodology which includes determination of asset value, threat/hazard, vulnerability, and risk, as applied to site, layout, and building.
2. Perform a subjective risk assessment for a given building by identifying the assessment components and prioritizing the asset-threat/hazard pairs of interest by relative risk, to focus resources on mitigation measures that reduce risk.
3. Identify the available mitigation measures appropriate for in-place or new design and determine when to apply to a given situation.
4. Recognize technology limitations and application details of mitigation measures for terrorist tactics and technological accidents involving explosive blast and agent release (chemical, biological, and radiological) to achieve a desired level of protection.
5. Perform a Tier 1 vulnerability assessment for a given building using the Building Vulnerability Assessment Checklist in FEMA 426 and adjust the subjective risk assessment based upon the identified vulnerabilities.
6. Select applicable mitigation measures for a given building and prioritize them based upon the final assessment relative risk values and the associated estimated risk reduction provided by the mitigation measures.
7. Give examples of potential conflicts between designing to mitigate building vulnerabilities against terrorist attacks and other design requirements, and the need for trade-offs to achieve acceptable compliance as well as desired Levels of Performance/Protection.

TARGET AUDIENCE

The primary target audience for this course includes engineers, architects, and Federal, State, and local government officials with engineering and architectural backgrounds, who are involved in mitigation planning and design to protect people and property against man-made hazards.

The secondary audience includes local planning officials, hazard mitigation specialists, security personnel, continuity of operation planners, and other professionals who may support Federal, State, and local planning and design efforts, such as consultants and academic staff.

COURSE STRUCTURE/STRATEGY

This course is delivered using a wide range of training methods, including lecture, demonstration, facilitated plenary group discussion, and a case study activity. PowerPoint visuals and limited videos are used to illustrate teaching points. In the case study activity, participant activity teams use a graphic organizer in the form of a poster-sized chart (called a Risk Matrix) to organize their work products. The course includes a written examination when it is conducted at FEMA's Emergency Management Institute (EMI).

An important component of the instructional strategy is the use of FEMA 426 and FEMA 452 as primary "textbooks." The purpose of this strategy is to enable the participants to become thoroughly familiar with the organization and contents of the documents. This strategy is implemented first by providing a thorough introduction to the documents in the Introduction and Course Overview (Unit I). Throughout the course, the instructors will continue to direct the participants to the pages in FEMA 426 and FEMA 452, where the important teaching points and illustrations are located.

Each unit of instruction begins with a presentation by an expert instructor using PowerPoint visuals to illustrate important teaching points. Instructors encourage questions from participants to elicit class discussion and to determine how best to meet participant learning needs and expectations.

Following the instructional component, each unit has an associated participant activity which reinforces the concepts and provides an opportunity for participants to apply what they are learning. Three different case studies have been developed for this purpose: Urban, Suburban, and COOP. The case study is selected well in advance of a given course offering, determined by the needs of the target audience.

In the introduction to each unit's participant activity, the instructor explains the requirements and provides an example of correct products. The Risk Matrix poster is provided to each group to record information throughout the series of activities. All members of the instructor staff work closely with the participant activity teams to facilitate completion of the requirements within the allotted times. At the conclusion of each work session, the unit instructor facilitates group reporting to ensure that all teams have produced answers which will enable them to successfully move on to the next component of the case study activity. This is an essential component of the instructional strategy because the activity-case study interaction builds throughout the course.

The final participant activity team product is a short verbal report on the team's findings that includes asset-threat/hazard pairs with highest risk, various mitigation measures to reduce the risk determined in the assessment, the top three prioritized mitigation measures selected to

reduce the highest risk asset-threat/hazard pairs of interest, and the rationale for these determinations. In the COOP version, the teams are also asked to report whether or not the case study building is acceptable as an alternate facility, and to provide a rationale for that conclusion.

COURSE DURATION

This course is three full days in length.

INSTRUCTOR QUALIFICATIONS

Instructors for *Building Design for Homeland Security* should be engineers, architects, or security professionals with expertise in performing assessments (antiterrorism vulnerability, facility condition, and/or security) or expertise as program managers in construction or hazard mitigation, along with expertise in building or system design, operations, or maintenance. An engineering, architectural, or security background is helpful when participants ask questions about applicable technologies and design concepts.

All instructors should have experience in the use of training methodologies appropriate for adult learners; training in adult learning and instructional methods is recommended.

These courses are ideally conducted by a team of three instructors in order to manage the participant activity teams in the case study activities, and to provide the depth of knowledge required to instruct the course topics.

Instructors are expected to thoroughly familiarize themselves with their instructional units in order to consistently follow the instructional methodologies and technical content in the instructor guide.

SUGGESTED COURSE SCHEDULE

The times listed below are approximate and are influenced by the location and specific circumstances of each course offering. For example:

- The first time listed for each unit refers to the Suburban and Urban versions of the course. The second time listed for each unit refers to the COOP version, and is included because of differences in the interests and learning needs of the COOP target audiences for the same topics.
- When the course is conducted at the Emergency Management Institute, a course exam is administered on Day Two. This requires adjustments in the schedule, including a reduction of Unit VI to a brief 30-minute overview.
- The timing for Unit XII, Finalization and Presentation of Case Study Results, assumes that there are a maximum of six teams presenting their findings. The timing is adjusted as necessary for more or fewer teams.

Day 1	Day 2	Day 3
Unit I - Introduction and Course Overview (1.5 Hours) (COOP 1.75 Hours)	Unit VI – FEMA 452 Risk Management Database (1.0 Hour) (COOP 1.5 Hours)	Unit X - Building Design Guidance (2.5 Hours) (COOP 2.75 Hours)
Unit II - Asset Value Assessment (1.25 Hours) (COOP 1.5 Hours)	Unit VII - Explosive Blast (1.0 Hour) (COOP 1.75 Hours)	Unit XI - Electronic Security Systems (0.75 Hour) (COOP 1.0 Hours)
Lunch	Lunch	Lunch
Unit III - Threat/Hazard Assessment (1.25 Hours) (COOP 1.25 Hours)	Unit VIII - Chemical, Biological, and Radiological (CBR) Measures (1.0 Hour) (COOP 2.0 Hours)	Unit XII - Finalization and Presentation of Case Study Results (2.25 Hours) (COOP 2.5 Hours)
Unit IV - Vulnerability Assessment (1.75 Hours) (COOP 1.75 Hours)	<i>At EMI only: Written Exam and Exam Review (1.0 Hour)</i>	Unit XIII (In E-156 and L156) – Conducting <i>Building Design for Homeland Security</i> Training (1.0 Hour) (COOP 0.75 Hour)
Unit V - Risk Assessment/ Risk Management (0.75 Hour) (COOP 0.5 Hours)	Unit IX - Site and Layout Design Guidance (2.5 Hours) (COOP 1.75 Hours)	Unit XIV - Course Wrap-up (1.0 Hour) (COOP 0.25 Hour)

COURSE MATERIALS, SUPPLIES, AND EQUIPMENT

The following materials, supplies, and equipment are needed to conduct this course.

Materials

The E155 electronic files use the following identification to show association with the respective Case Studies used in this course: A – Suburban case study, B – Urban case study, C – COOP case study. Masters for the following materials may be downloaded from <http://www.fema.gov/plan/prevent/rms/rmsp155.shtm>.

- Course Instructor Guide (IG), one per instructor. Note that there are three (3) versions of the instructor guide – Suburban, Urban, and COOP.
- Course Student Manual (SM), one per participant. Note that there are three (3) versions of the student manual – Suburban, Urban, and COOP.
- FEMA 426, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings*, one hard copy per participant.
- FEMA 452, *Database CD*, one per participant (or download from FEMA Security RMS website which is the desired approach).
- FEMA 452, *Risk Assessment: A How-To Guide to Mitigate Potential Terrorist Attacks Against Buildings*, one hard copy per participant.
- PowerPoint visuals (loaded on computer and backup CD). Note that there are three (3) versions of course visuals – Suburban, Urban, and COOP.
- Student Reference CD, one per instructor and one per participant. NOTE: This is maintained by Raytheon UTD with backups by date provided to URS Corp. EMI should retain a copy after each course for future use. This CD is identical for all course versions.

Supplies

- Easel pad stand with paper pad refill (one per participant activity team)
- Markers for use with easel pad (one package of various colors per participant activity team)
- Name plate (one per instructor and participant)
- Risk Matrix poster (one per participant activity team)
- White board markers for use by participants to record case study activities information on the Risk Matrix poster (one per participant activity team)

Optional Supplies:

- Highlighter (one per participant)
- Post-It® notes, smallest size available, to mark pages in the reference manuals (one pad per participant)

Equipment

- Calculator (one per participant activity team, brought by participant)
- Computer with display unit and Microsoft PowerPoint software

PRE-COURSE ACTIVITIES

Pre-Course Reading and Information to Participants

Pre-course preparation is essential to the success of these courses. Participants are notified by email of the following pre-course requirements:

- Download from <http://www.fema.gov/plan/prevent/rms/rmsp155.shtm>, print, and read the appropriate case study prior to coming to class. All participants must be familiar with the case study to perform successfully during the class activities and to maintain the course schedule. If the latest version of the course is not on the website, provide the case study using the FEMA Floodmaps website – Easy ftp.
- Provide background information to course instructor on personal experience in building construction, physical security, performing assessments, and similar topics applicable to the course. The information is needed to spread capability among all teams as interaction among team members is a major learning component of the course.
- (Optional) Download the FEMA 452dBv3.0-L156.zip file onto a laptop for which you have software loading rights or have received necessary System Administrator support in order to actively participate in an orientation to the FEMA 452 input and function screens.

Two notifications are recommended to ensure that participants are adequately prepared for the course. Using the Floodmaps website, one email notification should be sent two weeks prior to the commencement of the course; a second notification should be emailed seven days before the course begins.

Sample messages to participants are provided at the end of this Plan of Instruction.

Formation of Participant Activity Teams

Prior to the course offering, the lead instructor refers to the roster of enrolled participants (name, organization, job title, phone, and email) and background information provided by the participants by email prior to course or obtained on Day 1, to form participant activity teams. These teams will work together on the case study activities throughout the course. Ideally, teams have six to eight members with seven being optimal. Teams are intended to reflect the general participant profile in terms of organization, subdivision of that organization, current job, past experience, and other education/training. Ideally, security personnel, architects, engineers, planners, facility managers, etc., are interspersed among the teams to obtain a broad range of perspectives during the case study activities. Realistically, classroom layout and the number/size of tables also may influence team formation.

Participant activity teams are refined after the participant introductions and assessment of any new information not provided prior to the course. The instructor posts the team assignments and facilitates movement to the appropriate tables during the first break.

COURSE REFERENCES

The following publications were used in the development of this course and are included on the Student References CD.

Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health (CDC/NIOSH):

- Publication 2002-139, *Guidance for Protecting Building Environments from Airborne Chemical, Biological, or Radiological Hazards*
- Publication 2003-136, *Guidance for Filtration and Air Cleaning Systems to Protect Building Environments from Airborne Chemical, Biological, or Radiological Attacks*, April 2003

Federal Emergency Management Agency (FEMA):

- FEMA 154, *Rapid Visual Screening of Buildings for Seismic Hazards: A Handbook*, 2nd Edition, 2002
- FEMA 386-7, *Integrating Human-Caused Hazards Into Mitigation Planning*, September 2002
- *FEMA Continuity Of Operations Self-Assessment Tool* at URL: <http://www.fema.gov/government/coop/coopassessment3.shtm>
- FPC-65, Federal Preparedness Circular-65, June 15, 2004
- Interim Planning Guide For State and Local Governments, *Managing the Emergency Consequences of Terrorist Incidents*, July 2002, which updated SLG 101, *Guide for All-Hazard Emergency Operations Planning, Chapter 6, Attachment G, Terrorism*, April 2001

General Services Administration (GSA):

- GSA's *Recommended Methodology for Securing Alternate Facilities* at URL: http://www.gsa.gov/Portal/gsa/ep/contentView.do?contentType=GSA_BASIC&contentId=15326
- PBS – P100, *Facilities Standards for Public Buildings Service*, latest version

Lawrence Berkeley National Laboratory (LBNL):

- LBNL PUB-51959, *Protecting Buildings from a Biological or Chemical Attack: Actions to Take Before or During a Release*, January 10, 2003

Military Handbooks (MIL-HDBK) (U.S. Navy Executive Agent):

- MIL-HDBK-1013/1A, *Design Guidelines for Physical Security of Fixed Land-Based Facilities*, December 15, 1993
- MIL-HDBK-1013/10, *Design Guidelines for Security Fencing, Gates, Barriers, and Guard Facilities*, May 14, 1993
- MIL-HDBK-1013/12, *Evaluation of Security Glazing for Ballistic, Bomb, and Forced Entry Tactics*, March 10, 1997

- MIL-HDBK-1013/14, *Selection and Application of Vehicle Barriers*, February 1, 1999

National Capital Planning Commission:

- *Designing for Security in the Nation's Capital*, October 2001
- *The National Capital Planning Urban Design and Security Plan*, October 2002

U.S. Air Force (USAF):

- *Entry Control Facilities Design Guide*, February 18, 2003, Air Force Center for Environmental Excellence
- *Installation Entry Control Facilities Design Guide*, October 2002, Air Force Center for Environmental Excellence
- *Installation Force Protection Guide*, 1997, Air Force Center for Environmental Excellence

U.S. Army (USA):

- Field Manual (FM) 5-114, *Engineer Operations Short of War*, July 13, 1992
- Technical Manual (TM) 5-853-4, *Security Engineering, Electronic Security Systems*, May 12, 1994

U.S. Army Corps of Engineers (USACE):

- Engineer Technical Letter (ETL) 1110-3-498, *Design of Collective Protection Shelters to Resist Chemical, Biological, and Radiological (CBR) Agents*, February 24, 1999

U.S. Department of Commerce, Critical Infrastructure Assurance Office (DOC CIAO):

- *Vulnerability Assessment Framework 1.1*, October 1998

U.S. Department of Defense (DoD):

- Unified Facilities Criteria (UFC), UFC 4-010-01, *DoD Minimum Antiterrorism Standards for Buildings*, July 31, 2002 and January 22, 2007 update

U.S. Department of Veterans Affairs (VA):

- *Physical Security Assessment for the Department of Veterans Affairs Facilities, Recommendations of the National Institute of Building Sciences Task Group to the Department of Veterans Affairs*, September 6, 2002

PREREQUISITES

There are no prerequisites for this course. Completion of *Homeland Security Planning for Local Governments Course* (E408) will increase understanding of terrorist threats.

UNITS OF INSTRUCTION

The following pages provide a “snapshot” of each unit in the course, including:

- Unit learning objectives
- Scope of the unit content
- Instructional method for meeting the learning objectives
- Supplies and equipment needed to conduct the unit
- Relevant references

Note that while most teaching points are identical in all three versions of the course case studies, the responses to case study activities are different. Any variation in teaching points or instructional methods (e.g. different PowerPoint visuals) is incorporated into the instructional materials for the specific course.

UNIT I: INTRODUCTION AND COURSE OVERVIEW

Time: 90 minutes

OBJECTIVES

At the end of this unit, participants will be able to:

1. Describe the goal, objectives, and agenda for the course.
2. Locate information in FEMA 426, FEMA 452, and the Student Manual (course case study handout).

SCOPE

This unit covers the following topics:

- Welcome and opening remarks
- Instructor introductions
- Administrative information
- Participant introductions
- Course overview
- Course materials
- Activity: Case Study Overview

METHODOLOGY

The course manager or unit instructor welcomes the class and presents important administrative information required for the course. The course manager or instructor introduces the course evaluation form and requests that participants complete the appropriate sections of the form at the end of each unit of instruction rather than waiting until the end of the course.

All instructors introduce themselves, giving a brief statement of their backgrounds and experience. If not done during this unit, then the instructors provide this information at the start of their first instruction unit.

Participants introduce themselves, giving a brief summary of their backgrounds and experience including work in the course topic area if applicable, their reasons for attending the course and any expectations for the training. A member of the instructor staff records expectations on the easel pad.

The instructor presents an overview of the course, referring to the agenda and describing course requirements. The instructor introduces the course materials, ensuring that each participant has a copy of everything required for the course. Participants refer to FEMA 426 as the instructor conducts a short but systematic “tour” of the document, including a summary of the content in each section of each chapter along with the appendices. (Optional: Small Post-It® notes and

highlighters are provided for marking specific pages and sections that will be used later in the course.) The instructor introduces the course case study, including a short description of the layout and content, and provides directions for completing the related participant activity. In this activity, participants read and answer questions designed to direct attention to the content and organization of the case study.

The instructor concludes Unit I and transitions to Unit II, Asset Value Assessment.

SUPPLIES AND EQUIPMENT

The following are required for this unit:

- Case study (Suburban, Urban, or COOP) for participant activities
- Chart paper, easel pad and markers
- Course agenda
- Course evaluation form
- Course Instructor Guide, Unit I, (Suburban, Urban, or COOP)
- Course Student Manual, Unit I (Suburban, Urban, or COOP)
- FEMA 426, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings*
- FEMA 452, *Risk Assessment: A How-To Guide to Mitigate Potential Terrorist Attacks Against Buildings*
- Optional: Post-It® notes and highlighters
- Unit I visuals (Suburban, Urban, or COOP) in PowerPoint format, computer, LCD projector, and screen

SUGGESTED TIME PLAN

The following time plan is suggested for this unit:

<i>Topic</i>	<i>Time (minutes)</i>
Welcome, Opening Remarks, Instructor Introductions	5
Administrative Information	5
Participant Introductions	30
Course Overview	10
Course Materials	10
Case Study Activity	25
Summary and Transition.....	5
Total Time.....	90

REMARKS

1. It is very important that the participants are familiar with the organization and contents of FEMA 426 and the case study by the end of Unit I. They will refer to these documents throughout the course.
2. There are three instructor actions that must be accomplished during Unit 1:
 - Presentation of Unit 1 teaching points.
 - Recording of participant expectations on an easel pad.
 - Finalizing the participant activity teams based on information presented in the self-introductions. If participants have not emailed their professional feedback in advance, use a sign-up sheet at each table to collect this information prior to the introductions.

With three instructors, each instructor performs one of the tasks. Two instructors can perform these functions if the Unit I presenter also records the participant expectations. The same instructor cannot record expectations and finalize the participant activity teams.

UNIT II: ASSET VALUE ASSESSMENT

Time: 75 minutes

OBJECTIVES

At the end of this unit, participants will be able to:

1. Identify the assets of a building or site that can be affected by a threat or hazard.
2. Explain the components used to determine the value of an asset.
3. Determine the critical assets of a building or site.
4. Provide a numerical rating for each asset and justify the basis for the rating.

SCOPE

This unit covers the following topics:

- The core functions and critical infrastructure listed on the risk matrix
- Determining asset value
- Using a rating scale to determine an asset value
- Activity: Asset Value Rating

METHODOLOGY

The instructor discusses the generic core functions and critical infrastructure associated with a building as listed on the risk matrix. An asset value rating approach is presented. One or more specific examples are used to focus on the associated participant activity. The instructor “walks” through the examples, describing the asset in relation to the case study and applying the asset value rating approach.

The participants apply these techniques (asset identification and asset value rating) to identify and rate the assets found in the case study. The participants review the mission statement, building data, physical security, building structure, electrical systems, mechanical systems, information systems, and communications to have a sense of the value of the asset to the case study building.

SUPPLIES AND EQUIPMENT

The following are required for this unit:

- Case study (Suburban, Urban, or COOP) for participant activities
- Course Instructor Guide, Unit II (Suburban, Urban, or COOP)
- Course Student Manual, Unit II (Suburban, Urban, or COOP)

- FEMA 426, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings*, pages 1-10 to 1-14
- FEMA 452, *Risk Assessment: A How-To Guide to Mitigate Potential Terrorist Attacks Against Buildings*
- Optional: Post-It® notes and highlighters
- Unit II visuals (Suburban, Urban, or COOP) in PowerPoint format, computer, LCD projector, and screen

SUGGESTED TIME PLAN

The following time plan is suggested for this unit:

<i>Topic</i>	<i>Time (minutes)</i>
Identification of Core Functions and Critical Infrastructure.....	10
Asset Value Rating Approaches	10
Asset Value Rating Approach for Participant Activity.....	10
Application of Selected Asset Value Rating Approach.....	10
Activity: Asset Value Ratings.....	35
Total Time.....	75

REMARKS

The instructors must have a thorough understanding of the content of the case study and the rating methodology applicable to the first four activities. Each instructor should be prepared to facilitate the activities of at least two participant teams.

The various methodologies for assessing asset value, threat/hazard, vulnerability, and risk presented in FEMA 426, Chapter 1, are actually hybrids, whereby two or more of the assessment categories are encompassed in the selection matrix. The FEMA 426 methodology to be used in the case study attempts to ensure the actions and terminology remain consistent to the individual assessments in rating asset value, threat/hazard, and vulnerability. The FEMA 426 methodology is emphasized during the application of the asset value rating approach prior to the participant activity.

UNIT III: THREAT/HAZARD ASSESSMENT

Time: 75 minutes

OBJECTIVES

At the end of this unit, participants will be able to:

1. Identify the threats and hazards that may impact a building or site.
2. Define each threat and hazard using the FEMA 426 methodology.
3. Provide a numerical rating for the threat or hazard and justify the basis for the rating.
4. Define the Design Basis Threat, Levels of Protection, and Layers of Defense.

SCOPE

This unit covers the following topics:

- Sources of threat and hazard information
- The spectrum of event profiles for terrorism and technological hazards from FEMA 386-7
- The five components used by DoD to define a threat
- FEMA 426 rating scale and how to use it to determine a threat rating
- Activity: Threat-Hazard Rating

METHODOLOGY

The instructor begins this unit with a brief discussion of terrorism and technological hazards worldwide and within the United States. The instructor transitions to the probability of natural hazards and how they are considered during design, compared to the probability of manmade hazards, both terrorism and technological accidents. This sets the stage for identifying where to get information about threats and hazards.

The instructor refers to FEMA 386-7 to describe the spectrum of tactics or events that can occur, and introduces the five components used to define a threat or hazard.

Briefly, the instructor cites various threat rating systems to point out the range of different methodologies and their applicability to different situations. The instructor describes the spectrum of tactics or events that can occur, and introduces the FEMA 452 components used to define a threat or hazard. A simplified threat rating approach, described in FEMA 426, is introduced. This FEMA 426 approach forms the basis of the Unit III team participant activity. In E155/L155 (Suburban and Urban), the participant activity team select the threat ratings for the selected tactics against the selected assets. In E156/L156 (COOP), the participant activity focuses on providing the rationale for the ratings given, and the circumstances under which ratings may be changed. The differences in approach are based upon the different needs of the target audiences.

The instructor uses one threat/hazard example from the case study to focus participants on the activity. The instructor walks through the example, describing the threat and the threat rating approach.

The participants apply these techniques (threat identification, threat description, and threat rating) to the case study to identify and rate the selected threat from explosive blast and agents (chemical, biological, and radiological) either through technological accident or terrorist event.

SUPPLIES AND EQUIPMENT

The following are required for this unit:

- Case study (Suburban, Urban, or COOP) for participant activities
- Chart paper, easel, and markers
- Course Instructor Guide, Unit III (Suburban, Urban, or COOP)
- Course Student Manual, Unit III (Suburban, Urban, or COOP)
- FEMA 426, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings* (pages 1-14 to 1-24)
- FEMA 452, *Risk Assessment: A How-To Guide to Mitigate Potential Terrorist Attacks Against Buildings*
- Optional: Post-It® notes and highlighters
- Risk Matrix poster and box of dry-erase markers (one per team)
- Unit III visuals (Suburban, Urban, or COOP) in PowerPoint format, computer, LCD projector, and screen

SUGGESTED TIME PLAN

The following time plan is suggested for this unit:

<i>Topic</i>	<i>Time (minutes)</i>
Threats and Hazards.....	11
Steps to the Threat Selection and Rating Process.....	6
Threat Sources, Design Basis Threat, and Levels of Protection.....	11
Summary/Participant Activity/Transition.....	2
Activity: Threat / Hazard Rating.....	45
Total Time.....	75

REMARKS

The participants were introduced to the case study during the Unit I Introduction and Course Overview. In Unit III, participants will read the Threat Analysis and Hazard Analysis portions and then concentrate upon explosive blast and agents. There is not enough time to address all potential threats/hazards within the timeframe available. A review of the Geographic Information System (GIS) portfolio contained in the case study is recommended for gaining additional threat and hazard information.

UNIT IV: VULNERABILITY ASSESSMENT

Time: 105 minutes

OBJECTIVES

At the end of this unit, participants will be able to:

1. Explain what constitutes vulnerability.
2. Identify vulnerabilities using the Building Vulnerability Assessment Checklist.
3. Explain how an identified vulnerability may indicate that an asset is vulnerable to more than one threat or hazard and that mitigation measures may reduce vulnerability to one or more threats or hazards.
4. Provide a numerical rating for the vulnerability and justify the basis for the rating.

SCOPE

This unit covers the following topics:

- Vulnerability types, especially single-point vulnerabilities and tactics possible under threats/hazards for which there are no mitigation measures
- Approaches and considerations to determine vulnerabilities
- A rating scale and how to use it to determine a vulnerability rating
- Activity: Vulnerability Rating

METHODOLOGY

The instructor discusses generic vulnerabilities found in a building and how tactics possible under various threats/hazards can be used against a building. The goal is to enable the participants to anticipate the thought process used by terrorists to select a tactic against a target. The instructor will present the vulnerabilities that exist for many of these tactics. Employing a methodology similar to that used in Units II and III, various approaches for determining vulnerability will be cited.

One or more specific examples will be used to focus the participants on the associated participant activity. The instructor walks through the examples, describing the vulnerability in relation to the case study, and applying the vulnerability rating approach. The participants are introduced to the use of the Building Vulnerability Assessment Checklist at the end of Chapter 1 of FEMA 426 or FEMA 452, Appendix A. The instructor will reemphasize use of the checklist in Units IX and X covering Chapters 2 and 3, respectively, of FEMA 426. Note that the vulnerability rating at this point in the assessment process is a rapid screening approach (FEMA 452, Tier I assessment), which provides an initial vulnerability rating based upon mitigation measures already in place against the threat/hazard tactic. It is derived from the interview process with the building management and staff and used to focus the actual vulnerability assessment to be performed later.

The participants apply the vulnerability identification, or lack of mitigation measures, and vulnerability rating to the case study to identify and rate the vulnerabilities for each asset-threat/hazard pair of interest. The participants quickly review the building data, physical security, building structure, electrical systems, mechanical systems information systems, communications, emergency response, and GIS portfolio to have a sense of the vulnerabilities at the case study facility. The Building Vulnerability Assessment Checklist is used here to capture the sense of potential vulnerabilities and mitigation measures. It is used in greater depth in Units IX and X after the participants have learned more about the physics of the tactics (explosive blast and CBR agents) in regards to building construction and layout.

SUPPLIES AND EQUIPMENT

The following are required for this unit:

- Case study (Suburban, Urban, or COOP) for participant activities
- Chart paper, easel, and markers
- Course Instructor Guide, Unit IV (Suburban, Urban, or COOP)
- Course Student Manual, Unit IV (Suburban, Urban, or COOP)
- FEMA 426, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings*, pages 1-24 to 1-35 and pages 1-45 to 1-93
- FEMA 452, *Risk Assessment: A How-To Guide to Mitigate Potential Terrorist Attacks Against Buildings*, pages 3-1 to 3-20
- Optional: Post-It® notes and highlighters
- Risk Matrix poster and box of dry-erase markers (one per team)
- Unit IV visuals (Suburban, Urban, or COOP) in PowerPoint format, computer, LCD projector, and screen

SUGGESTED TIME PLAN

The following time plan is suggested for this unit:

<i>Topic</i>	<i>Time (minutes)</i>
Introduction and Unit Overview	5
Identification of Vulnerabilities	30
Rating of Vulnerabilities.....	15
Summary/Activity/Transition	5
Activity: Vulnerability Rating	50
Total Time.....	105

REMARKS

In this unit more time is allotted during the activity, allowing the participant teams to complete a thorough review of the case study and to review or modify prior participant team activities as necessary. In the Suburban and Urban versions of the course, the emphasis is on developing the ratings; in the COOP version the emphasis is on the rationale for the different ratings.

UNIT V: RISK ASSESSMENT/RISK MANAGEMENTTime: 45 minutes

OBJECTIVES

At the end of this unit, participants will be able to:

1. Explain what constitutes risk.
2. Evaluate risk using the Risk Matrix poster to capture assessment information.
3. Provide a numerical rating for risk and justify the basis for the rating.
4. Identify top risks for asset-threat/hazard pairs of interest that should receive measures to mitigate vulnerabilities and reduce risk.

SCOPE

This unit covers the following topics:

- Definition of risk and the various components used to determine a risk rating
- The FEMA 426 approach to determining risk
- A rating scale and how to use it to determine a risk rating
- The relationships between high risk, the need for mitigation measures, and the need to identify a Design Basis Threat and Level of Protection
- Activity: Risk Rating

METHODOLOGY

The instructor defines risk by its components (ratings for asset value, threat/hazard, and vulnerability). One or more examples are used to show the participants how to determine and evaluate the risk rating for each asset-threat/hazard pair of interest in the threat-vulnerability matrix. The instructor also discusses the relationship between an identified high risk asset-threat/hazard pair of interest and the need for mitigation measures to reduce that risk by reducing the vulnerability rating. Finally, the value of providing a Design Basis Threat and Desired Level of Protection is presented. The instructor explains that the Design Basis Threat and Desired Level of Protection provide essential information to designers, builders, and owners on the materials necessary to construct buildings that can withstand identified threats.

The participant activity is primarily a math exercise in multiplying asset value, threat/hazard, and vulnerability ratings to determine the risk rating and then compare it against the risk rating scale. The instructor explains that the top three risks should receive additional emphasis during an actual vulnerability assessment, both to validate the risk by identifying vulnerabilities and as an input to select mitigation measures.

SUPPLIES AND EQUIPMENT

The following are required for this unit:

- Case study (Suburban, Urban, or COOP) for participant activities
- Chart paper, easel, and markers
- Course Instructor Guide, Unit V (Suburban, Urban, or COOP)
- Course Student Manual, Unit V (Suburban, Urban, or COOP)
- FEMA 426, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings*, pages 1-35 to 1-44
- FEMA 452, *Risk Assessment: A How-To Guide to Mitigate Potential Terrorist Attacks Against Buildings*, pages 4-1 to 4-9
- Optional: Post-It® notes and highlighters
- Risk Matrix poster and box of dry-erase markers (one per team)
- Unit V visuals (Suburban, Urban, or COOP) in PowerPoint format, computer, LCD projector, and screen

SUGGESTED TIME PLAN

The following time plan is suggested for this unit:

<i>Topic</i>	<i>Time (minutes)</i>
Introduction and Unit Overview	5
Risk and Rating Approaches.....	7
Selecting Mitigation Measures	5
Process Review/Summary/Transition.....	3
Activity: Risk Rating	25
Total Time.....	45

REMARKS

Additional activity time may again be provided for participants to review completed work. If this is not feasible, teams may use time after class on Day 1 or before class on Day 2.

UNIT VI: FEMA 452 RISK ASSESSMENT DATABASETime: 60 minutes

OBJECTIVES

At the end of this unit, participants will be able to:

1. Identify where to save photos, maps, drawings, plans, etc. to interface with the database.
2. Explain the information required for the database to function within each screen, how to move between screens, and switch between the assessor's tool and the master database.
3. Explain the benefit and approaches to setting priorities on identified vulnerabilities.
4. Explain how to use the master database to produce standard reports and search the database for specific information.
5. **OPTIONAL** Complete the FEMA 452 database install process. (Completion of this objective requires more time than allotted for the unit and necessitates course schedule adjustment. Participants receive pre-course instructions on loading the database onto their laptops if they wish to participate actively in the orientation to the FEMA 452 database. There is no accommodation for the install process in the unit schedule.)

SCOPE

This unit covers the following topics:

- Inputting data into the database and linking associated information, such as GIS images, miscellaneous files, and photos
- Navigation in the database to operate all functions
- Risk management capability using the database
- **OPTIONAL:** Demonstration of the installation of the risk assessment database. With V3.0 the database is a single entity with two different Graphical User Interfaces (GUIs) to interact with the information – assessor tool mode and master database mode.
- **OPTIONAL ACTIVITY:** Participants install and navigate the databases following the instructor's presentation.

METHODOLOGY

The instructor introduces the unit and provides background on the origin and status of the database. The PowerPoint presentation associated with this unit consists primarily of screen captures of the database. The course originally included a demonstration of navigating the actual database but restrictions on loading software or connecting laptop video outputs on projection systems has eliminated that option in most course offerings.

OPTIONAL: In course offerings, where desired by the host organization and technically feasible, participants may be instructed to download and install onto their laptops the database program

files from the FEMA website or from the CD provided during this course. In that case the instructor explains and demonstrates how to use the Assessor Tool mode and the Master Database mode. Participants can attempt to practice how to navigate and use the database. Participants without laptop computers may team with those who do, or simply follow along with the “screen captures” in the PowerPoint presentation.

SUPPLIES AND EQUIPMENT

The following are required for this unit:

- FEMA 426, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings*, Chapter 1
- FEMA 452, *Risk Assessment - A How-To Guide to Mitigate Potential Terrorist Attacks Against Buildings*, pages 4-1 to 4-10
- FEMA 452, *Risk Assessment Database CD with Install Wizard* (latest version)
- Instructor Guide, Unit VI (Suburban, Urban, or COOP)
- Optional: Post-It® notes and highlighters
- Risk Matrix poster and box of dry-erase markers (one per team)
- Student Manual, Unit VI (Suburban, Urban, or COOP)
- Unit VI visuals (Suburban, Urban, or COOP) in PowerPoint format, computer, LCD projector, and screen

SUGGESTED TIME PLAN

The following time plan is suggested for this unit:

<i>Topic</i>	<i>Time (minutes)</i>
Introduction and Unit Overview	2
Program Installation – Assessor Tool	5
Program Installation – Master Database	5
Database Overview	2
Assessor Tool.....	28
Master Database.....	16
Summary	2
Total Time.....	60

REMARKS

The time for this unit may be reduced to a brief 30-minute overview when necessary. When the course is conducted at the Emergency Management Institute, this unit is condensed to 30 minutes to allow time for the course exam.

NOTE: A tutorial covering all aspects of the database will be available in the future on the FEMA Security Risk Management Series website. At that time this unit will consist only of the 30 minute overview.

UNIT VII: EXPLOSIVE BLAST

Time: 60 minutes

OBJECTIVES

At the end of this unit, participants will be able to:

1. Explain the basic physics involved during an explosive blast event, whether by terrorism or technological accident.
2. Explain building damage and personnel injury resulting from the blast effects upon a building.
3. Perform an initial prediction of blast loading and effects based upon incident pressure.

SCOPE

This unit covers the following topics:

- Time-pressure regions of a blast event and how these change with distance from the blast
- Difference between incident pressure and reflected pressure
- Differences between peak pressure and peak impulse and how these differences affect building components
- Building damage and personal injuries generated by blast wave effects
- Levels of protection used by DoD and the Interagency Security Committee
- The nominal range-to-effect chart (minimum stand-off in feet versus weapon yield in pounds of TNT-equivalent) for an identified level of damage or injury
- The benefits of stand-off distance
- Approaches to predicting blast loads and effects, including one using incident pressure
- Activity: Explosives Environment, Stand-Off Distance, and Effects of Explosive Blast

METHODOLOGY

After introducing the unit the instructor presents the characteristics of the blast wave associated with detonating explosives and explains how these characteristics impact building components and people. The instructor describes how these effects are associated with Levels of Protection, which may be desired when designing a building, and how they are determined during tests. The use of a nominal range-to-effect chart is presented as a screening tool and as a lead-in to the benefits of stand-off. Various approaches for predicting blast loads and effects are presented, such as software available to government agencies and a paper-based approach using incident pressure. The instructor summarizes the discussion with video footage from the Manchester, England, bombing and then facilitates the unit's participant exercise. In this unit the participant activity is a "check on learning" which addresses the explosives environment, calculating stand-

off distance and the damage that would be sustained at various stand-off distances. Participants calculate required standoff, applying the nominal range-to-effect chart to the case study building and the selected Design Basis Threats for explosive blast.

SUPPLIES AND EQUIPMENT

The following are required for this unit:

- Case study (Suburban, Urban, or COOP) for participant activities
- Chart paper, easel, and markers
- Course Instructor Guide, Unit VII (Suburban, Urban, or COOP)
- Course Student Manual, Unit VII (Suburban, Urban, or COOP)
- FEMA 426, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings*, Chapter 4
- Optional: Post-It® notes and highlighters
- Unit VII visuals (Suburban, Urban, or COOP) in PowerPoint format, computer, LCD projector, and screen (includes video footage of Manchester bombing)

SUGGESTED TIME PLAN

The following time plan is suggested for this unit:

<i>Topic</i>	<i>Time (minutes)</i>
Introduction and Unit Overview	5
Blast Characteristics and Their Interaction with Buildings	15
Types of Building Damage and Personal Injuries Caused by Blast Effects	10
Levels of Protection Used by Federal Agencies	5
The Nominal Range-to-Effect Chart and Benefits of Stand-off	5
Predicting Blast Loads and Effects	5
Activity: Explosives Environment, Stand-off Distance and Effects of Explosive Blast.....	15
Total Time.....	60

REMARKS

After the participants have received this training on the assessment process, the nature of explosive blast and how it affects people and buildings, they are better prepared to comprehend this threat tactic. This knowledge enables participants to more readily associate blast and the design issues of FEMA 426, Chapters 2 and 3, with the design issues associated with the explosive blast tactic.

UNIT VIII: CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL (CBR) MEASURESTime: 60 minutes

OBJECTIVES

At the end of this unit, participants will be able to:

1. Explain the five possible CBR protective actions for a building and its occupants.
2. Compare filtration system efficacy relative to the particles present in CBR agents.
3. Explain the key issues with CBR detection.
4. Identify the indications of CBR contamination.

SCOPE

This unit covers the following topics:

- Five protective actions for a building and its occupants: evacuation; sheltering in place; personal protective equipment; air filtration and pressurization; and exhausting and purging
- Air filtration and cleaning principles and their application
- CBR detection technology currently available
- Indications of CBR contamination that do not use technology
- Activity: Chemical, Biological, and Radiological Measures

METHODOLOGY

After introducing the unit, the instructor presents the characteristics of CBR agents, how to operate or build to reduce the effects of these agents, the principles of air filtration and cleaning, and how to apply this equipment. The instructor also provides information on the current technology for detecting CBR agents and the non-technology indications of CBR contamination in effective air filtration unit sizes, and what mitigation measures can be used in the facility's HVAC system to destroy bacteria and viruses. In Units III and IV of this course, participants determined the prevalent CBR threats to the case study facility and its vulnerability to these CBR threats. The Unit VIII activity is a check-on-learning about the nature of chemical, biological, and radiological agents and associated mitigation measures.

SUPPLIES AND EQUIPMENT

The following are required for this unit:

- Case study (Suburban, Urban, or COOP) for participant activities
- Chart paper, easel, and markers
- Course Instructor Guide, Unit VIII (Suburban, Urban, or COOP)

- Course Student Manual, Unit VIII (Suburban, Urban, or COOP)
- FEMA 426, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings*, Chapter 5
- Optional: Post-It® notes and highlighters
- Unit VIII (Suburban, Urban, or COOP) visuals in PowerPoint format, computer, LCD projector, and screen

SUGGESTED TIME PLAN

The following time plan is suggested for this unit:

<i>Topic</i>	<i>Time (minutes)</i>
Protective Actions for Buildings and Occupants	15
CBR Detection and Technology	15
Air Filtration and Cleaning Principles and Technology	15
Activity: CBR Considerations	15
Total Time.....	60

REMARKS

After completing the previous units related to the assessment process, this unit's examination of the nature of CBR agents and the technology for detecting and removing them from buildings provides participants with a solid basis for comprehending this threat tactic. This preparation is essential for participants to learn the design considerations for CBR protection addressed in Chapters 2 and 3 of FEMA 426.

EMI ONLY: The mid-course written examination will be administered after this unit and lunch. The time allotted is 30 minutes for the exam and 30 minutes for the review. The exam will cover information presented to this point and will take 15 to 30 minutes to complete. The exam consists of 25 multiple-choice, fill-in-the-blank, short answer, and true-false questions.

UNIT IX: SITE AND LAYOUT DESIGN GUIDANCETime: 150 minutes

OBJECTIVES

At the end of this unit, participants will be able to:

1. Identify site planning concerns that can create, reduce, or eliminate vulnerabilities and their relationship to the concept of “Layers of Defense.”
2. Recognize protective issues for suburban and urban site planning.
3. Compare the pros and cons of barrier mitigation measures that increase stand-off, or promote the need for hardening of buildings at risk.
4. Explain the need for keeping up with the growing demand for security design.
5. Describe at least one benefit of appropriate security design.
6. Describe at least one benefit of adopting a creative process to face current design challenges.
7. Provide at least one example of including aesthetic elements compatible with security and architecture characteristics of building and surrounding environment.
8. Apply these concepts to an existing site or building and identify mitigation measures needed to reduce vulnerabilities.

SCOPE

This unit covers the following topics:

- Land use considerations both outside and inside the property line
- Site planning issues to include site design, layout and form, vehicular and pedestrian circulation, and landscape and urban design
- Creating stand-off distance using perimeter controls, non-exclusive zones, and exclusive zones along with the design concepts and technology to consider
- Design considerations and mitigation measures for building security
- Activity: Site and Layout Design Guidance

METHODOLOGY

After introducing the unit, the instructor refers participants to FEMA 426, Chapter 2. The instructor explains, in sequential order, the major points of each section, emphasizing the interrelationships between concepts. Major concepts include: 1) antiterrorism design must be balanced against many other requirements; and 2) architectural considerations can provide protection without resulting in a “fortress,” based on the construction techniques used.

The instructors facilitate this unit’s activity, which requires the participant activity teams to perform an assessment of the case study site and layout, and use the Building Vulnerability

Checklist to identify vulnerabilities and possible mitigation measures. Participants estimate new risk ratings for high risk asset-threat/hazard pairs of interest based on the recommended mitigation measures.

SUPPLIES AND EQUIPMENT

The following are required for this unit:

- Case study (Suburban, Urban, or COOP) for participant activities
- FEMA 426, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings*, Chapter 2, Checklist at end of Chapter 1
- FEMA 452, *Risk Assessment - A How-To Guide to Mitigate Potential Terrorist Attacks Against Buildings*, pages 5-1 to 5-16
- Instructor Guide, Unit IX (Suburban, Urban, or COOP)
- Post-It® notes and highlighters
- Risk Matrix poster and box of dry-erase markers (one per team)
- Student Manual, Unit IX (Suburban, Urban, or COOP)
- Unit IX visuals (Suburban, Urban, or COOP) in PowerPoint format, computer, LCD projector, and screen

SUGGESTED TIME PLAN

The following time plan is suggested for this unit:

<i>Topic</i>	<i>Time (minutes)</i>
Introduction and Unit Overview	5
Layout Design and Land Use Considerations.....	15
Site Planning Issues	15
Entry Control and Vehicle Access.....	15
Design Considerations and Mitigation Measures	20
Walk-through of Building Vulnerability Assessment Checklist	20
Activity: Site and Layout Design Guidance	60
Total Time.....	150

REMARKS

Units IX and X re-emphasize the use of the Building Vulnerability Assessment Checklist. The participant activity for Unit IX has a large number of requirements, and can only be completed in the allotted time if participants within each group split up the work load.

UNIT X: BUILDING DESIGN GUIDANCETime: 150 minutes

OBJECTIVES

At the end of this unit, participants will be able to:

1. Explain architectural considerations to mitigate impacts from blast effects and transmission of chemical, biological, and radiological agents from exterior and interior incidents.
2. Identify key elements of building structural and nonstructural systems for mitigation of blast effects.
3. Compare and contrast the benefit of building envelope, mechanical system, electrical system, fire protection system, and communications system mitigation measures, including synergies and conflicts.
4. Apply these concepts to an existing building or building conceptual design and identify mitigation measures needed to reduce vulnerabilities.

SCOPE

This unit covers the following topics:

- Architectural considerations, including building configuration, space design, and special situations
- Building structural and nonstructural considerations with emphasis on progressive collapse, loads and stresses, and good engineering practices
- Design issues for the building envelope, including wall design, window design, door design, and roof system design with approaches to define levels of protection
- Mechanical system design issues, including interfacing with operational procedures, emergency plans, and training
- Other building systems design considerations for electrical, fire protection, communications, electronic security, entry control, and physical security that mitigate the effects of a threat or hazard
- Activity: Building Design Guidance

METHODOLOGY

After introducing the unit the instructor presents the information from FEMA 426, Chapter 3, in sequential order, shown in an overview slide, on the major assessment and mitigation concepts of each section, emphasizing the interrelationships between approaches. Many of the concepts for building systems are repetitive, and are covered as general considerations. Specific concerns within a system are covered by exception. The discussion emphasizes the provision of a balanced

building envelope that is a defensive layer against the terrorist tactic of interest and the avoidance of situations where one incident affects more than one building system.

In the case study activity the participant activity teams use the Building Vulnerability Assessment Checklist to identify vulnerabilities and mitigation measures in the case study building. This activity focuses on the building systems sections of the case study and the Building Vulnerability Assessment Checklist sections covering building systems and interior security systems. This activity has a large number of requirements, and can only be completed in the allotted time if participants within each group split up the work load.

SUPPLIES AND EQUIPMENT

The following are required for this unit:

- Case study (Suburban, Urban, or COOP) for participant activities
- FEMA 426, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings*, Chapter 3, Checklist at end of Chapter 1
- FEMA 452, *Risk Assessment - A How-To Guide to Mitigate Potential Terrorist Attacks Against Buildings*, pages 5-1 to 5-16
- Instructor Guide, Unit X (Suburban, Urban, or COOP)
- Post-It® notes and highlighters
- Risk Matrix poster and box of dry-erase markers (one per team)
- Student Manual, Unit X (Suburban, Urban, or COOP)
- Unit X visuals (Suburban, Urban, or COOP) in PowerPoint format, computer, LCD projector, and screen

SUGGESTED TIME PLAN

The following time plan is suggested for this unit:

<i>Topic</i>	<i>Time (minutes)</i>
Introduction and Unit Overview	10
Architectural Considerations	15
Structural and Nonstructural Considerations	15
Building Envelope Considerations	15
Other Building Systems	15
Walk-through of Building Vulnerability Assessment Checklist	20
Activity: Building Design Guidance.....	60
Total Time.....	150

UNIT XI: ELECTRONIC SECURITY SYSTEMS

Time: 45 minutes

OBJECTIVES

At the end of this unit, participants will be able to:

1. Use the assessment process to identify electronic security system requirements that are needed to mitigate vulnerabilities.
2. Describe the electronic security system concepts and practices that warrant special attention to enhance public safety.
3. Explain the basic concepts of electronic security system components, their capabilities, and their interaction with other systems.
4. Justify selection of electronic security systems to mitigate vulnerabilities.

SCOPE

This unit covers the following topics:

- Control centers and building management systems
- Perimeter layout and zoning of sensors
- Intrusion detection systems and sensor technologies
- Entry-control systems and electronic entry control technologies
- Closed circuit television and data-transmission media
- Definitions of the degree of security and control
- Activity: Electronic Security Systems

METHODOLOGY

After introducing the unit the instructor provides an overview of the Electronic Security Systems section of Chapter 3 and Appendix D in FEMA 426. The discussion addresses mitigation measures available to reduce risks due to vulnerabilities in physical security systems, using the various components and technology currently available for use in electronic security systems. These include exterior and interior intrusion detection systems; access control, including biometrics; closed circuit television; and terminology to describe levels of security.

In this unit's activity, participants complete the portions of the Building Vulnerability Assessment Checklist which address security systems, adjust risk ratings if necessary, select mitigation measures, and recalculate risk ratings for high risk asset-threat/hazard pairs based on the recommended mitigation measures.

SUPPLIES AND EQUIPMENT

The following are required for this unit:

- Case study (Suburban, Urban, or COOP) for participant activities
- FEMA 426, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings*, Pages 3-47 to 3-50; Appendix D; and Checklist at end of Chapter 1
- Instructor Guide, Unit XI (Suburban, Urban, or COOP)
- Optional: Post-It® notes and highlighters
- Risk Matrix poster and box of dry-erase markers (one per team)
- Student Manual, Unit XI (Suburban, Urban, or COOP)
- Unit XI visuals (Suburban, Urban, or COOP) in PowerPoint format, computer, LCD projector, and screen

SUGGESTED TIME PLAN

The following time plan is suggested for this unit:

<i>Topic</i>	<i>Time (minutes)</i>
Introduction and Unit Overview	3
Perimeter Layout and Zoning Sensors	1
Intrusion Detection Systems and Technology	12
Entry Control Systems and Technology	5
CCTV Systems and Data Transmission Media	1
Security Operations Center	1
Summary/Participant Activity/Transition	2
Activity: Electronic Security Systems	20
Total Time.....	45

UNIT XII: FINALIZATION AND PRESENTATION OF CASE STUDY RESULTS

Time: 135 minutes

(The time required by this unit of instruction is dependent upon the number of participant activity teams and the total number of participants.)

OBJECTIVES

At the end of this unit, participants will be able to:

1. Explain building security design issues to a building owner for consideration prior to a renovation or before new construction.
2. Explain the identification process used to arrive at the high risk asset-threat/hazard pairs of interest.
3. Justify the recommended mitigation measures, explaining the benefits of reducing the risk for the high risk situations of interest.

SCOPE

This unit covers the following topics:

- Preparation of final participant activity team findings
- Presentation of participant activity team reports
- Instructor feedback

METHODOLOGY

The instructor introduces the unit (spending up to 20 minutes reviewing the case study and answering any participant questions), explaining the tasks to be accomplished and the procedure for the participant activity team reports. Teams are instructed to review their findings from the previous units' activities, decide upon their three top risks and three top mitigation measures, and complete the table provided for this purpose. Spokespersons are allowed 5-7 minutes per team to present findings, including rationale and justification, to the class. The instructor team provides appropriate feedback. Then an instructor provides a mitigation measures cost review along with blast and plume analyses to correlate with the mitigation measures selected.

SUPPLIES AND EQUIPMENT

The following are required for this unit:

- FEMA 426, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings*
- FEMA 452, *A How-To Guide to Mitigate Potential Terrorist Attacks Against Buildings*
- Instructor Guide, Unit XII (Suburban, Urban, or COOP)
- Risk Matrix poster and box of dry-erase markers (one per team)

- Student Manual, Unit XII (Suburban, Urban, or COOP)
- Unit XII visuals (Suburban, Urban, or COOP) in PowerPoint format, computer, LCD projector, and screen

SUGGESTED TIME PLAN

The following time plan is suggested for this unit:

<i>Topic</i>	<i>Time (minutes)</i>
Activity: Preparation of Presentation by Participant Activity Teams.....	45
Presentation by Participant Activity Teams.....	90
Total Time.....	135

REMARKS

If applicable (EMI), the team presentations provide the second grade for the course.

UNIT XIII (In L156 and E156): CONDUCTING *BUILDING DESIGN FOR HOMELAND SECURITY* TRAINING

Time: 60 minutes

OBJECTIVES

At the end of this unit, participants will be able to:

1. Discuss basic adult learning principles as they apply to participants in *Building Design for Homeland Security*.
2. Explain the key functions of instructional delivery as they apply to *Building Design for Homeland Security*.
3. Describe the key steps of instructional preparation as they apply to *Building Design for Homeland Security*.

SCOPE

This unit covers the following topics:

- Learning styles and preferences, characteristics of adult learners, adult learning assumptions (experience, motivation, active participation and variety)
- Adult training methodologies used in *Building Design for Homeland Security*
- Steps for instructional preparation, preparing the environment, preparing yourself, expecting the unexpected

NOTE: FEMA's National Continuity of Operations Division is responsible for assisting Federal and State agencies, and local governments, in developing capability to complete risk assessments of their COOP sites. One way to assist these agencies is to train their COOP managers and planners to perform the methodology described in FEMA 426, in the COOP-specific version of this course, E156/L156. To expand this capability further, the graduates of E156/L156 will be expected to train others to conduct risk assessments using the FEMA 426 methodology. E156/L156 may be considered a "train-the-trainer" only in the sense that graduates can be expected to go back to their agencies and train others on the job to assist and eventually conduct the risk assessment methodology using FEMA 426 and FEMA 452 as job aids. Graduates might also be expected to conduct the risk assessment methodology component of the course, which is essentially Day One of E156/L156.

METHODOLOGY

After the instructor introduces the unit, participants complete a brief self-assessment of their perceptions about adult learning. If time is limited the participants are instructed to do this activity upon returning to home or office. The instructor segues to a discussion about the

characteristics of adult learners as they apply to the target audience for *Building Design for Homeland Security*.

In the activity for the unit the participants are given instructor guides for the course and teams are assigned to briefly review the objectives and instructional methodologies of the unit. Their assignment is to explain how the learning objectives are fulfilled in the unit, identify the different instructional methodologies employed in the unit, and explain how they address adult learning needs.

The instructor transitions to a brief discussion about preparing to conduct the risk assessment portion of the course, and distributes a matrix that identifies the logistical requirements and preparation required to conduct those units. The instructor “walks through” the matrix, and answers any questions.

SUPPLIES AND EQUIPMENT

The following are required for this unit:

- Chart paper, easel, and markers
- Course Train-the-Trainer CD (distribute one to each participant) containing PowerPoints, Instructor Guides, and Student Manual files for complete course
- Handouts: Self-Assessment tool, articles on adult learning, and requirements matrix
- Optional: Post-It® notes and highlighters
- Unit XIII visuals in PowerPoint format, computer, LCD projector, and screen

SUGGESTED TIME PLAN

The following time plan is suggested for this unit:

<i>Topic</i>	<i>Time (minutes)</i>
Adult Learning Principles	20
Instructional Delivery	20
Course Preparation.....	20
Total Time.....	60

UNIT XIV: COURSE WRAP-UPTime: 60 minutes

OBJECTIVES

At the end of this unit, participants will be able to:

1. Reflect upon their reasons for attending the course (as stated during Unit 1 Introductions), on the conduct of the course, and determine whether their expectations were met.
2. Provide verbal feedback related to the course, including likes and dislikes, and value of the training.
3. Provide written feedback to the course manager or director and instructors through course evaluation forms and verbal comments related to the course specifically, or building design for Homeland Security in general.

SCOPE

This unit covers the following topics:

- Discussion of general issues and concerns
- Course evaluations – forms and verbal comments
- Distribution of course certificates

METHODOLOGY

The course manager, director, or instructor summarizes the key points of the course, links them to the expectations of the participants as stated in Unit I, and answers any final questions.

The course manager, director or instructor solicits verbal feedback about the training, and requests that participants also complete the written evaluation forms.

When all participants have finished the evaluations and handed them in, the course manager, director or instructor distributes the course certificates and adjourns the class.

SUPPLIES AND EQUIPMENT

No references are required for this unit.

SUGGESTED TIME PLAN

The following time plan is suggested for this unit:

<i>Topic</i>	<i>Time (minutes)</i>
General Discussion	15
Course Evaluations	25
Distribution of Course Certificates	20
Total Time.....	60

COURSE EVALUATIONS

Level 1

The EMI Course Evaluation Form (FEMA 95-41, Aug 96) will be used to document participant's overall impression of the facilities, instructors, and course content using a 1-5 rating system (a 5 being the highest). Verbal comments will also be collected from the participants to supplement the evaluation forms.

Level 2

(Optional except at EMI) Each participant will complete an individual written exam to assess their understanding of the assessment process, design concepts, and mitigation measures used to design buildings against potential terrorist attack. The exam consists of 25 questions (multiple choice, true-false, and/or short answer) and requires a score of 70 percent to pass. In addition, the participant activity teams will each provide a short verbal report on the selected participant activity case study, providing the top three prioritized mitigation measures the group selected and the rationale behind the selection. The pass/fail grade for this verbal report will be assigned to each participant in the respective group.

PRECOURSE EMAIL NOTIFICATION

The following is an example of an email to send to course participants. Tailor items in italics to the specific course offering.

Send the first two parts to participants in any course offering. Send the third part (Risk Assessment Database) when the course will include an opportunity for participants to work with the FEMA 452 database either during or after class. Before recommending that participants download the FEMA 452 database from the FEMA Risk Management Series website, check the URL to ensure that the current version of the database is available from the site. (NOTE: When Version 5.0 of the database is released it will be called the FEMA 452/455 Database.)

SAMPLE

You are receiving this email because you have been identified as a participant in the *(name of course)* course, on *(start and end dates of course)*, in *(city and state of course location)*.

The FEMA Floodmaps website was used to send this information due to the size of the file that must be downloaded. Please download this file ASAP as the files are retained on the Floodmaps server for only 7 days. (We will reload these files after they expire as needed.) Downloads from the FEMA Risk Management Series website are also recommended below.

There are two *(or three)* major actions to perform in preparation for participation this training. *(The first two are required and the third is optional.)*

1. Case Study

Download and READ the (Filename of Student Manual Appendix uploaded to Floodmaps) prior to coming to the first day of class. If you do not read this document, you will be “playing catch-up” all of Day 1. The case study is integral to participant activities throughout the course.

Either before or after reading the Case Study, REVIEW the Building Vulnerability Assessment Checklist Questions contained in FEMA 426 and FEMA 452. This is a great way to understand what you will be looking at during an assessment and provide an insight into how the Case Study will be used in the training.

- Checklist questions are on pages 1-45 to 1-93 in Chapter 1 of FEMA 426
- Checklist questions are in Appendix A of FEMA 452
- The questions are identical in both publications

You can download these publications from the FEMA Security Risk Management Series (RMS) Publications website at the following URLs:

- <http://www.fema.gov/plan/prevent/rms/index.shtm> accesses all FEMA Security RMS Publications
- <http://www.fema.gov/library/viewRecord.do?id=1559> to access the link to download Chapter 1 of FEMA 426

- <http://www.fema.gov/library/viewRecord.do?id=1938> to access the link to download Appendix A of FEMA 452

2. Professional Information

We need information about your background to build the teams in which you will be performing the participant activities beginning mid-morning of Day 1. We are particularly interested in any experience with building construction, physical security, performing assessments, and similar topics applicable to the course. The information is needed to ensure that capability is distributed evenly among all teams as interaction among team members is a major learning component of the course. Please send the following information to (*email address*) by the Sunday night prior to the course.

- Job Title / Job Description – Principal Responsibilities
- Office Name (down to branch level) and Office Location (address)
- Education (degrees and subject areas, including majors and minors)
- Training (outside the degree programs, including certifications like Emergency Medical Technician, Explosive Ordnance Disposal, Volunteer Fire Fighter, American Society of Industrial Security, and the like)
- Other experience (military, including specialty; other jobs, etc.)

3. Risk Assessment Database (Optional)

If you would like to install the FEMA 452 database and would like to work with it during (*or after*) class on the second day, download the FEMA 452dBv3.0-L156.zip file (*Use the filename uploaded onto FEMA Floodmaps*). Unzip the files contained therein and, with the help of your System Administrator, install the database on a laptop that you plan to bring to the class.

An alternative to downloading the database from the FEMA Floodmaps website is to download the database from the FEMA Risk Management Series website at the following URL: <http://www.fema.gov/plan/prevent/rms/rmsp452.shtm>. Go to Risk Management Database V3.0, download the ZIP file, unzip that file and install the database. Download the User Guide for the install directions.

Minimum hardware and software requirements are listed below. Your System Administrator can confirm that these minimums are present and provide authorizations to install as required. Government computers tend to restrict software installation by anyone other than a System Administrator.

- Pentium® 4 or equivalent
- Windows XP
- MS Access® 2002
- 256 MB of RAM recommended for all components

Retain the unzipped files in a known location on the laptop or storage media as certain files will be used during the instruction unit to demonstrate features.

Bringing a laptop is not a requirement for the class. The laptop will only be beneficial during the first presentation on Day 2 when the database instruction is given. If you do not bring a laptop to class, download the database anyway, for future use as desired. If you want to begin familiarizing yourself with the database prior to class, read the initial portion of the User Guide provided for instructions on how to access the database.

Please remember to respond with your Professional Information to (*provide appropriate email address*) by (*date*). Also email me (*or other instructor name*) if you have ANY questions or difficulties concerning the major actions covered in this email. Alternately, call me (*or other instructor name*) at (*appropriate complete phone number*).

Looking forward to seeing you in class.

(*Add first and last name of instructor*)

(*Add course number*) Instructor