Unit I-A

COURSE TITLE	Building Design for Homeland Security	**TIME**	90 minutes
UNIT TITLE	Introduction and Course Overview		

OBJECTIVES

1. Describe the goal, objectives, and agenda for the course
2. Describe and find material in the course reference manual and student activity handout

SCOPE

The following topics will be covered in this unit:

1. Welcome and Opening Remarks
2. Instructor Introductions
3. Administrative Information
4. Student Introductions
5. Course Overview
6. Course Materials
7. Activity: Refamiliarize with Case Study materials

REFERENCES

1. Course Agenda
2. Course Goal and Objectives
3. EMI Evaluation Forms
4. FEMA 426, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings*
5. Case Study – Appendix S: Suburban, Hazardville Information Company
6. Student Manual, Unit I-A
7. Unit I-A visuals

REQUIREMENTS

1. FEMA 426, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings* (one per student)
2. FEMA 452, *Risk Assessment - A How-To Guide to Mitigate Potential Terrorist Attacks Against Buildings* (one per student)
3. Instructor Guide, Unit I-A
4. Suburban Case Study Student Manual (A) (one per student)
5. Overhead projector or computer display unit
6. Unit I-A visuals
7. Risk Matrix poster and dry-erase markers (one per team)
8. Chart paper, easel, and markers (one per team)

UNIT I-A OUTLINE

PREPARING TO TEACH THIS UNIT

- **Tailoring Content to the Local Area:** This instruction unit has no linkages to the Local Area. The unit is a course overview and familiarization with the contents of the Urban Case Study.

- **Optional Activity:** There are no optional activities in this unit.

- **Activity:** The students will begin refamiliarizing themselves with the Case Study materials. The Case Study is a risk assessment and analysis of mitigation options and strategies for a typical commercial office building located in a mixed urban-suburban environment business park. The assessment will use the DoD Antiterrorism Standards and the GSA Interagency Security Criteria to determine Levels of Protection and identify specific vulnerabilities. Mitigation options and strategies will use the concepts provided in **FEMA 426** and other reference materials.

- Refer students to their Student Manual for worksheets and activities.

- Direct students to the appropriate page in the Student Manual.

- Instruct the students to read the activity instructions found in the Student Manual. Note that this Student Activity provides page numbers for each question to assist the students in their familiarization and answering of the questions.

- Tell students how long they have to work on the requirements.

- While students are working, all instructors should closely observe the groups' process and progress. If any groups are struggling, immediately assist them by clarifying the assignment and providing as much help as is necessary for the groups to complete the requirement in the allotted time. Also, monitor each group for full participation of all members. For example, ask any student who is not fully engaged a question that requires his/her viewpoint to be presented to the group. This latter point may not be evident in this first student activity.

- At the end of the working period, reconvene the class.

- After the students have completed the assignment, "walk through" the activity with the students during the plenary session. Call on different teams to provide the answer(s) for each question. Then simply ask if anyone disagrees. If the answer is correct and no one disagrees, state that the answer is correct and move on to the next requirement. If there is disagreement, allow some discussion of rationale, provide the "school solution" and move on.

- If time is short, simply provide the "school solution" and ask for questions. Do not end the activity without ensuring that students know if their answers are correct or at least on the right track.

- Ask for and answer questions.

INSTRUCTOR NOTES	CONTENT/ACTIVITY

VISUAL I-A (S)-11

Welcome and Opening Remarks

Welcome the students to the Building Design for Homeland Security Course.

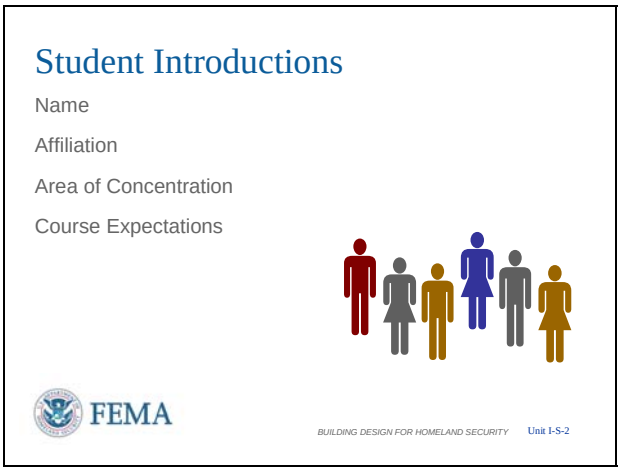
Introduce yourself and have the other instructors introduce themselves, using:

- Your name
- Your company or organization
- Brief statement of background and experience

Make the necessary administrative announcements, including:

- Housing, parking, and meals
- Attendance, start/stop times, breaks
- Restroom locations
- Messages and emergencies
- Fire exits

VISUAL I-A (S)-2



Recommend an instructor not presenting Unit I to collect Student Expectations on an easel tablet for reference throughout the course and review in Unit XIII.

Student Introductions

Ask the students to introduce themselves, including:

- Name
- Affiliation
  - Brief statement of background and experience
  - Include any work done in course topic area
- Reasons they are attending course / course expectations. [These will be reviewed during Unit XIII, Course Wrap-Up.]

INSTRUCTOR NOTES | **CONTENT/ACTIVITY**

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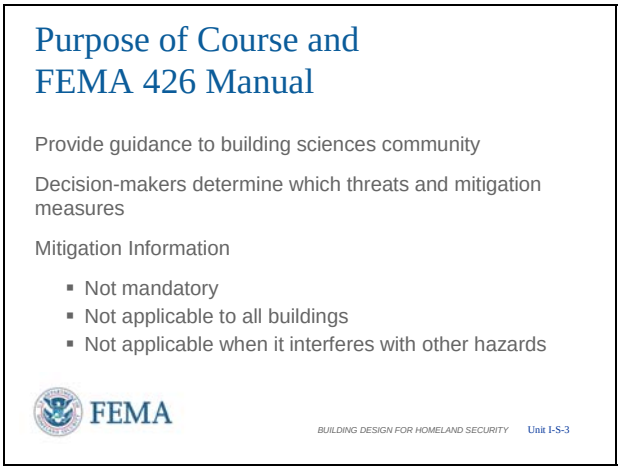


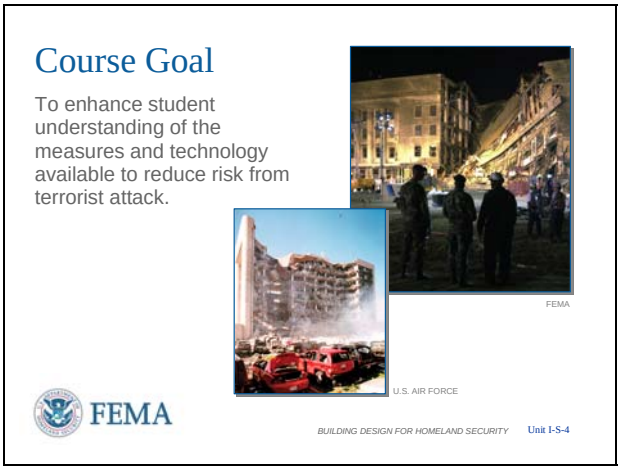
Purpose

The purpose of **FEMA 426** and this course is to provide guidance to the building sciences community working for public and private institutions. It presents tools to help decision-makers assess the performance of their buildings against terrorist threats and to rank recommendations. It is up to the decision-makers to decide which types of threats they wish to protect against and to determine their level of risk against each threat. Those decision-makers who consider their buildings to be at high risk can use this guidance as necessary.

The mitigation information in **FEMA 426** and this course is:

- Not mandatory
- Not applicable to all buildings
- Not applicable when it interferes with other hazards such as fire, seismic, or life safety requirements contained in building codes

VISUAL I-A (S)-4



Course Goal

The goal of this course is to enhance student understanding of the measures and technology available to reduce risk from terrorist attack.

Included in this understanding is the process for assessing risk to focus upon which mitigation measures have the greatest applicability and benefit. The students will understand the design approaches to mitigate manmade hazards and comprehend the trade-offs needed to optimize various design requirements.

INSTRUCTOR NOTES | **CONTENT/ACTIVITY**

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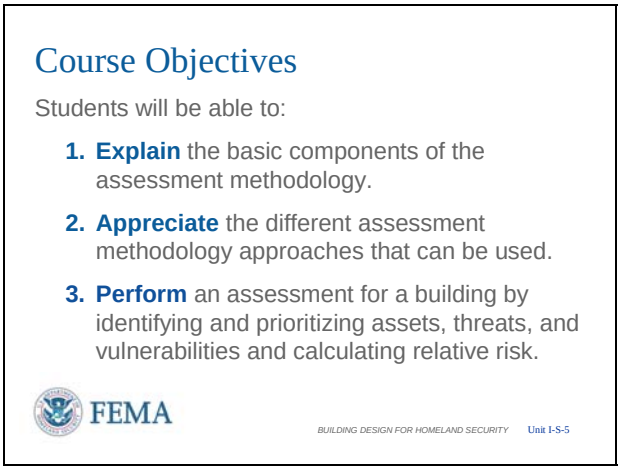


Course Objectives (1 of 3)

The primary target audience for this course is engineers, architects, and state and local government and building officials with engineering and architectural backgrounds involved in mitigation planning and design to protect people and property against manmade hazards. Security personnel and first responders have also attended to understand the concerns of man-made hazards and the impact upon their areas of responsibility.

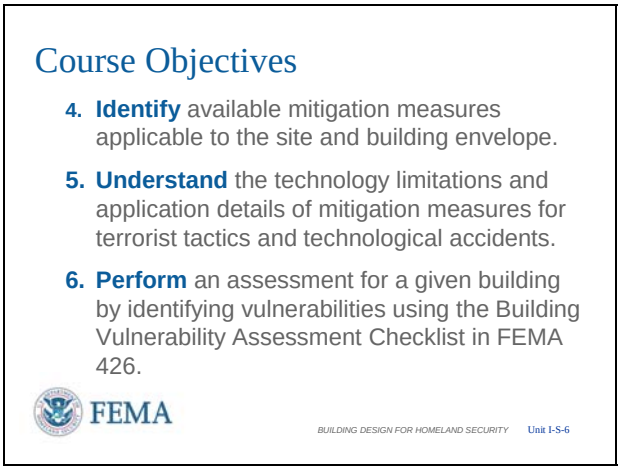
After attending the Building Design for Homeland Security course, the students should be able to:

1. Explain the basic components of the assessment methodology – threat/hazard, asset value, vulnerability, and risk, as applied to site, layout, and building.

2. Appreciate the different assessment methodology approaches being used by Federal agencies and comprehend which approach to use for a given organizational structure.

3. Perform an assessment for a given building by identifying the assessment components and prioritizing the asset-threat/hazard pairs by their relative risk to focus resources upon mitigation measures that reduce risk.

INSTRUCTOR NOTES	CONTENT/ACTIVITY
VISUAL I-A (S)-6	**Course Objectives** (2 of 3)



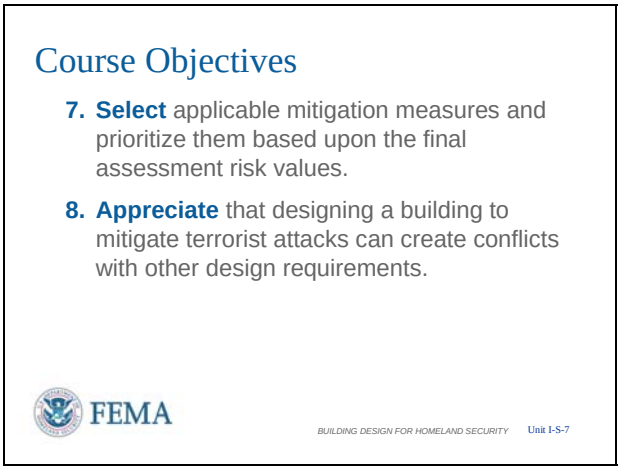
4. Identify available mitigation measures either in-place or for new design and comprehend their applicability to a given situation.

5. Understand the 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.

6. Use the **Building Vulnerability Assessment Checklist in FEMA 426 (Table 1-22, pages 1-46 to 1-93)** and adjust the assessment relative risk based upon the identified vulnerabilities.

VISUAL I-A (S)-7

Course Objectives (3 of 3)



7. Select applicable mitigation measures and prioritize them based upon the final assessment relative risk values and associated estimated risk reduction provided so as to focus limited resources, all for a given situation.

8. Appreciate that designing to mitigate building vulnerabilities against terrorist attacks has conflicts with other design requirements, resulting in trade-offs to achieve acceptable compliance and levels of performance among the differing regulations, codes, programs, operational requirements, and owner desires within the resources available.

INSTRUCTOR NOTES | **CONTENT/ACTIVITY**

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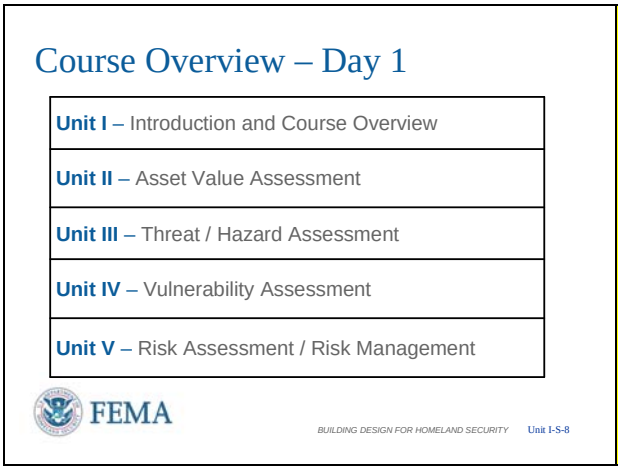

Course Overview – Day 1

This course is a full 3 days in length and includes 13 units of instruction. Most instruction blocks have an associated student activity using a Case Study to emphasize the concepts taught and apply what was just learned.

A detailed schedule is located in your Student Manuals. This is Unit I – Introduction and Course Overview. It will review the other blocks of instruction and the course materials.

For the rest of the first day, the course will introduce the components of risk and how to determine risk. Unit II – Asset Value Assessment will discuss how to identify assets – or things to be protected, and how to assign a relative value to them.

Unit III will examine the Threat/Hazard Assessment process and identify the threats and hazards that could impact a building or site, describe how to assess these threats and hazards, and provide a numerical rating for the threat or hazard.

Unit IV will cover Vulnerability Assessment, including what constitutes vulnerability and how to identify vulnerabilities using the **Building Vulnerability Assessment Checklist in FEMA 426 (Table 1-22, pages 1-46 to 1-93).**

Finally, the last Topic that will be covered on Day 1 is Unit V – Risk Assessment / Risk Management. Students will be taught what constitutes risk and how to determine a numerical value for risk and be introduced to the concept of the Design Basis Threat. This unit will be completed on Day 2.

INSTRUCTOR NOTES | **CONTENT/ACTIVITY**

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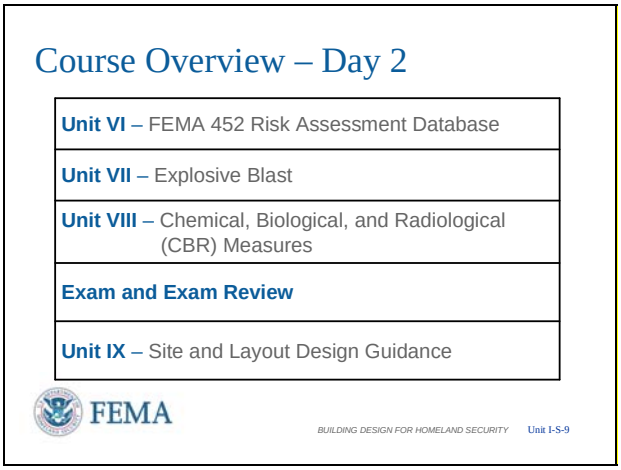


Course Overview – Day 2

Day 2 will start with Unit VI which presents the associated software database. The database is an electronic way of managing the information you collected manually yesterday to assess risk, make observations, and identify vulnerabilities and mitigation measures, track actions, and generate reports. The database presents an efficient way to manage the diverse information collected during a risk and vulnerability assessment.
[Options: If you brought a laptop, you can use the FEMA 452 Database CD to follow along the presentation, by installing and navigating the database. However, the demonstration / performance approach has not been fully successful for various reasons, so opportunity at lunch and at the end of the day will be made to assist in loading the database.]

Units VII and VIII will provide students with an understanding of some of the weapons commonly used by terrorists. Unit VI will cover explosive blast and Unit VII will cover chemical, biological, and radiological or CBR weapons.

No course would be complete without an exam – so there will be an open book multiple choice/short answer exam on Day 2. [This is the first component of the student evaluation for resident courses taught at the Emergency Management Institute (EMI). When taught as a traveling team away from EMI, the exam is not included.]

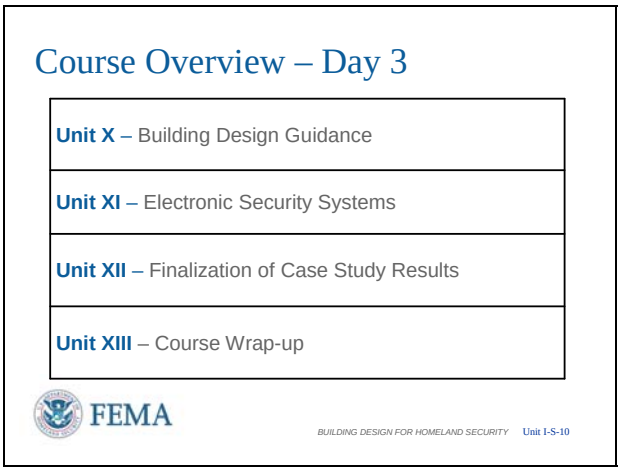
After the exam, the course will begin to explore mitigation options for reducing the risk and impact of terrorist attacks against buildings.

Unit IX – Site and Layout Design Guidance will cover things you can do to mitigate

INSTRUCTOR NOTES | **CONTENT/ACTIVITY**

terrorist attacks for the site – meaning from the property line up to the building.

VISUAL I-A (S)-10



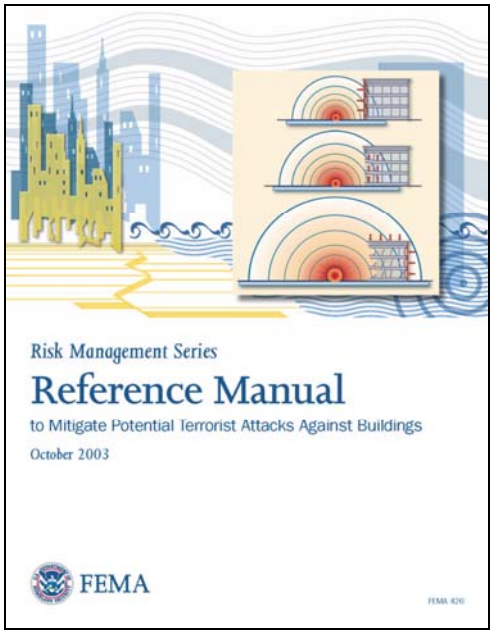
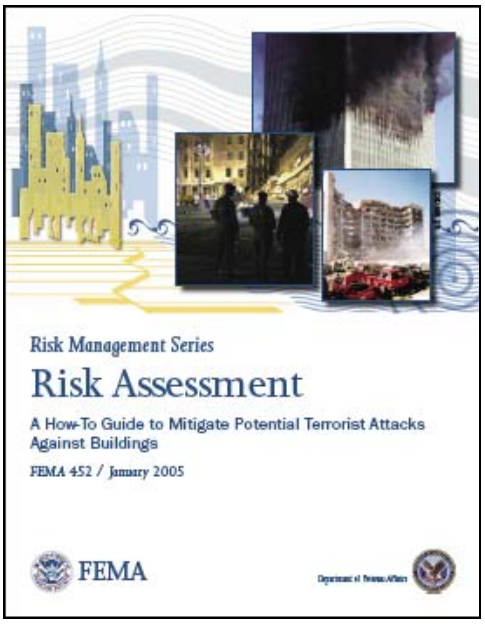
Course Overview – Day 3

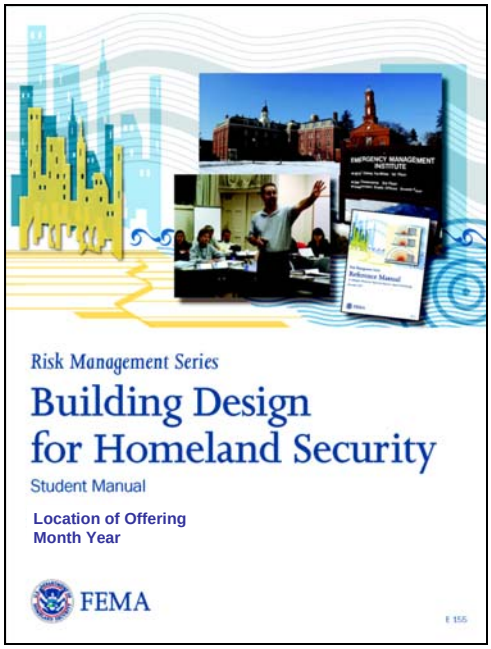
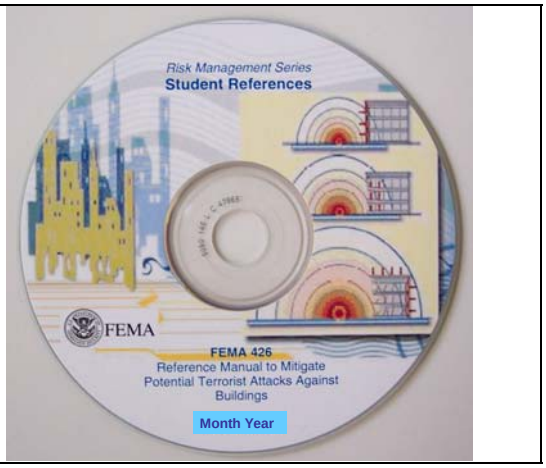
Unit X will explore mitigation options for the building envelope and inside the building.

Unit XI will introduce the basic concepts of electronic security systems.

As mentioned earlier – each block of instruction has an associated student activity using a Case Study to emphasize the concepts taught and apply what was just learned. In Unit XII, students will present the results of their work using the Case Study – highlighting their top three risks identified by the group, the vulnerabilities identified for these risks, and the top three mitigation measures to reduce vulnerability and risk. One member of the group will have about 5 minutes to brief their team's results. [This is the second component of the grading system for resident courses at the Emergency Management Institute.]

Finally, Unit XIII will summarize the key points from the course and answer any final questions.

INSTRUCTOR NOTES	CONTENT/ACTIVITY
NO SLIDE – USE HARDCOPY  Display a copy of **FEMA 426**	**FEMA 426** • This is the primary reference for this course • Throughout the course, slides will contain references to figure and page number, as appropriate, in this document. • There will be a comprehensive introduction to the document later in this unit.
NO SLIDE – USE HARDCOPY  Display a copy of **FEMA 452.**	**FEMA 452** • This is the "How-To" document that supplements FEMA 426 and expands the content of instruction units 2, 3, 4, and 5. • It introduces the FEMA 452 Databases as the Risk Management tools to support the assessment and mitigation processes • Similar to FEMA 426, the slides will contain reference to figure and page number taken from this document, as appropriate, as well as other publications

INSTRUCTOR NOTES	CONTENT/ACTIVITY
NO SLIDE – USE HARDCOPY	**Student Manual**
	• The Student Manual will be primarily used as a workbook for activities designed to apply major teaching points. • Each unit contains worksheets that will be completed in the small group student activity sections of each unit. • **Appendix S** of the Student Manual is the Suburban Case Study: Hazardville Information Company (HIC) that you were asked to read prior to beginning this course.
Display a copy of the **Student Manual** binder.	
NO SLIDE – USE HARDCOPY	**Student References CD**
	• The Student Reference CD contains electronic copies of various documents that will be referenced during this course and many that are contained in the Bibliography contained in FEMA 426. • Tell students that they should have this CD in their handout packages at their seats.
Show the double-sided media storage package containing the **Student Reference CD** and the **FEMA 452 Databases CD**.	

INSTRUCTOR NOTES	CONTENT/ACTIVITY
NO SLIDE – USE HARDCOPY  Show the reverse side of the media storage package to show the **FEMA 452 Databases CD**.	**FEMA 452 Databases CD** • The FEMA 452 Databases CD contains the installation programs, User Guides, and files that will be used to demonstrate the features, capabilities, and operation of the databases. • Tell students that they should have this CD in their handout packages at their seats. • Point out to the students that the CD found inside the back cover of FEMA 452 is the enterprise version (Version 1.0) of the database as explained in the appendices at the end of that publication. The CD handed out is the latest version of the database. See the User Guide on this CD for installation and use instructions. • Finally, tell the students that if they would like to have help loading the database on their laptop (if they brought one) to bring the laptop on Day 2 and we will assist in loading during lunch or at the end of the day.
NO SLIDE – USE HARDCOPY Walk to a table and indicate the Risk Matrix poster (laminated with threats/hazards, critical functions, and critical infrastructure cells that the student will fill out with ratings for asset value, threat/hazard rating, vulnerability rating, and risk rating.	**Risk Matrix Poster** • The small group student activities are focused on the HIC Case Study (Suburban). • In small groups, you will conduct a phased assessment of the HIC building after each step of the assessment process is introduced by the instructors. • The final activity involves the development of possible mitigation actions to address identified risks. • The Risk Matrix poster is provided for groups to keep a comprehensive record of their findings and for use in presenting these findings to the class.

INSTRUCTOR NOTES | **CONTENT/ACTIVITY**

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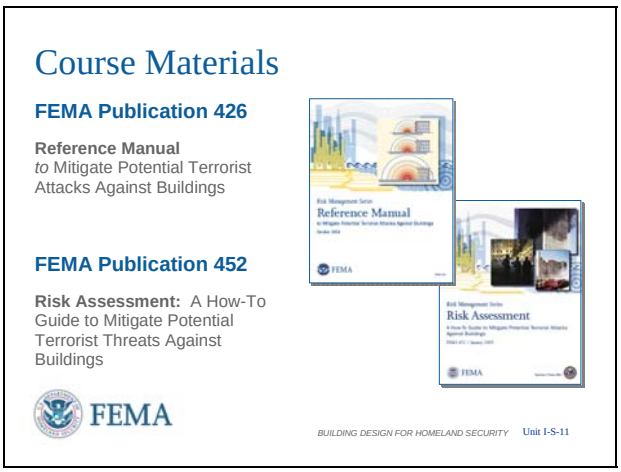

Confirm that each student has a copy of these materials.

Course Materials

At this point each student should have the following:

- **FEMA Publication 426**
- **FEMA Publication 452**
- Student Manual for the Case Study Version **(S – Suburban)** being used in this offering of the course.
- Risk Matrix Poster
- Multi-color dry-erase markers for use on the Risk Matrix Poster.
    - NOTE: The dry-erase markers are easy to erase, meaning that anything placed on top of the posters will erase the entries – so do not place anything on the posters once you start filling them in.

Now that we have confirmed the Course Materials you should have in your possession, we will **look further into the FEMA 426 and 452 publications**.

INSTRUCTOR NOTES | **CONTENT/ACTIVITY**

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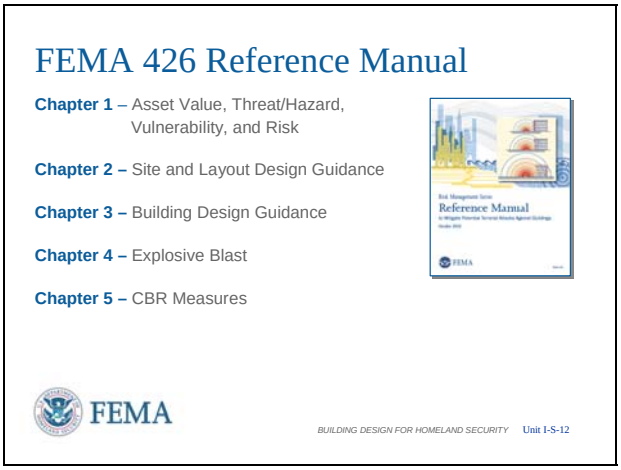

As you begin the following walk-through of **FEMA 426**:

Point out that the students will be following **FEMA 426** throughout the course and will use some sections heavily during exercises. The course visuals include **FEMA 426, FEMA 452, and other page references** for easy reference.

Encourage them to flag key pages and passages with Post-It® notes and highlighting.

Ask them to open **FEMA 426** and follow along as you preview the contents.

FEMA 426 Reference Manual

There are five chapters in the manual as listed here. This manual contains many how-to aspects based upon current information contained in FEMA, Department of Commerce, Department of Defense (including Army, Navy, and Air Force), Department of Justice, General Services Administration, Department of Veterans Affairs, Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health, and other publications. It is intended to provide an understanding of the current methodologies for assessing asset value threat/hazard, vulnerability, and risk, and the design considerations needed to improve protection of new and existing buildings and the people occupying them. As needed, this manual should be supplemented with more extensive technical resources, as well as the use of experts when necessary.

Key concepts:

- Design Basis Threat
- Levels of Protection
- Layers of Defense

INSTRUCTOR NOTES | **CONTENT/ACTIVITY**

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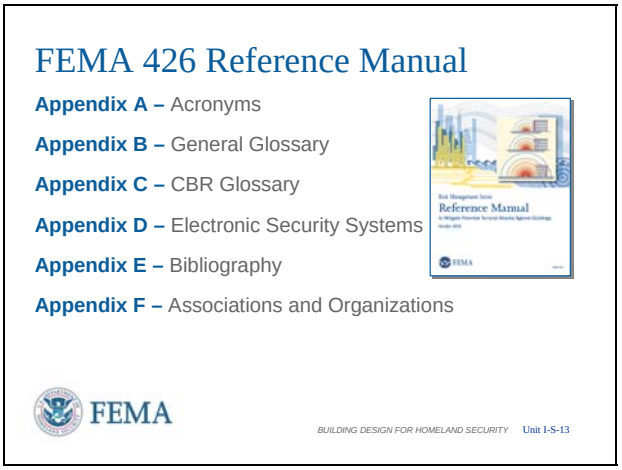

FEMA 426 Appendices

The manual also has six appendices to facilitate its use as a reference:

- Appendix A – Acronyms
- Appendix B – General Glossary
- Appendix C – CBR Glossary
- Appendix D – Electronic Security Systems
- Appendix E – Bibliography
- Appendix F – Associations and Organizations

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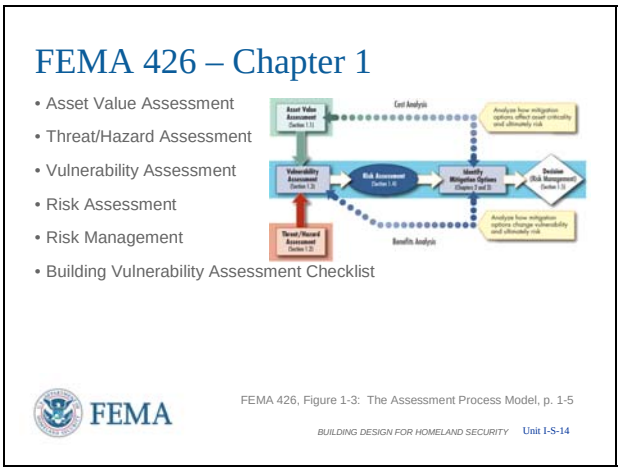

FEMA 426 - Chapter 1: Asset Value, Threat/ Hazard, Vulnerability, and Risk

Chapter 1 presents selected methodologies to integrate threat/hazard, asset criticality, and vulnerability assessment information using applications such as the FEMA HAZUS-MH Geographic Information System (GIS) application to overlay imagery and maps to show access points, blast stand-off, and other site and building information.

The chapter also presents a risk matrix for the preparation of risk assessments. The topic areas of Chapter 1 are:

- Asset Value Assessment
- Threat/Hazard Assessment
- Vulnerability Assessment
- Risk Assessment
- Risk Management
- Building Vulnerability Assessment Checklist

Finally, Chapter 1 provides an assessment checklist that compiles many best practices (based upon current technologies and scientific research) to consider during the

For each of the following chapters, have the students flip through each chapter and highlight some of the key concepts, graphics, etc.

INSTRUCTOR NOTES | **CONTENT/ACTIVITY**

design of a new building or renovation of an existing building.

Assessment Flow Chart

The assessment flow chart illustrates the process you will follow in conducting the assessment.

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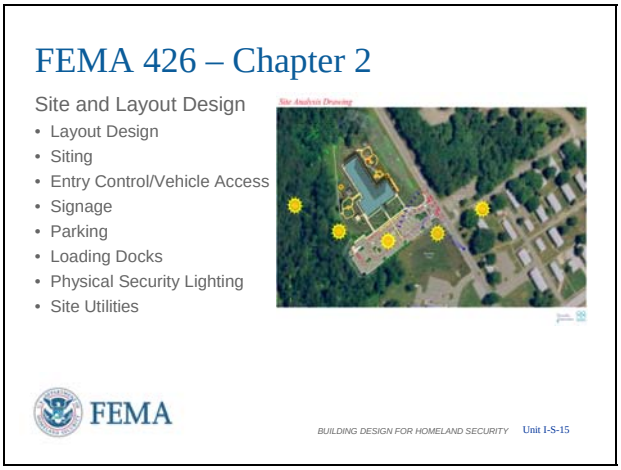

FEMA 426 - Chapter 2: Site Layout and Design Guidance

Chapter 2 discusses architectural and engineering design considerations (mitigation measures), starting at the perimeter of the property line, and includes the orientation of the building on the site. Therefore, this chapter covers issues outside the building envelope.

Chapter 2 also discusses the following site layout and design topics:

- Layout Design
- Siting
- Entry Control/Vehicle Access
- Signage
- Parking
- Loading Docks
- Physical Security Lighting
- Site Utilities

INSTRUCTOR NOTES | **CONTENT/ACTIVITY**

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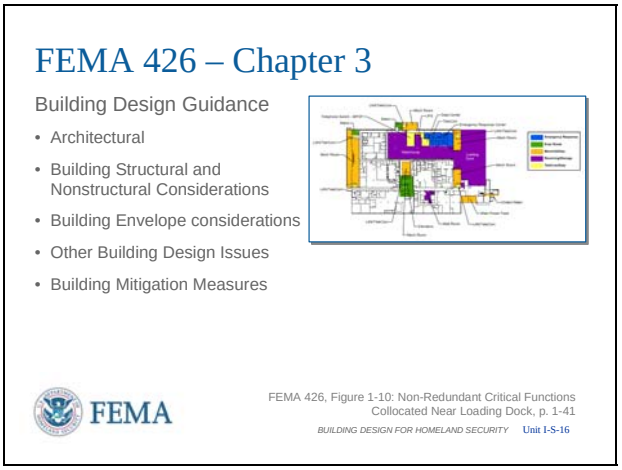

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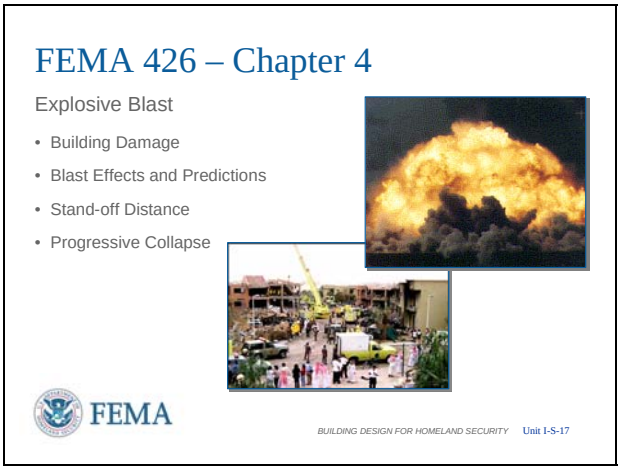


FEMA 426 - Chapter 3: Building Design Guidance

Chapter 3 provides the same considerations for the building – its envelope, systems, and interior layout.

The topic areas in Chapter 3 include:

- Architectural
- Building Structural and Nonstructural Considerations
- Building Envelope Considerations
- Other Building Design Issues
- Building Mitigation Measures

FEMA 426 - Chapter 4: Explosive Blast

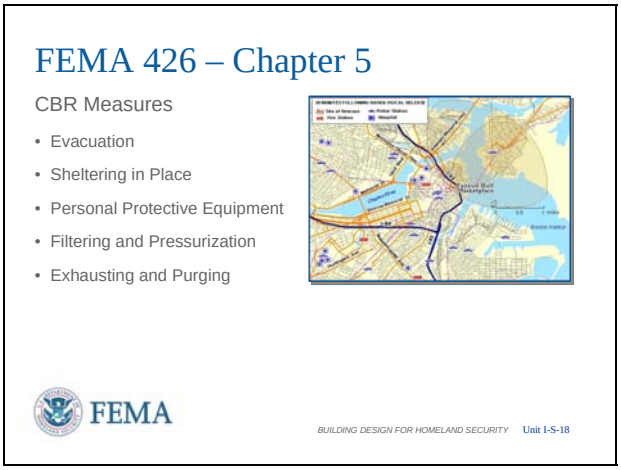
Chapter 4 provides a discussion of blast theory to understand the dynamics of the blast pressure wave, the response of building components, and a consistent approach to define levels of protection.

Some of the details you will address include:

- Building Damage
- Blast Effects and Predictions
- Stand-off Distance
- Progressive Collapse

INSTRUCTOR NOTES | **CONTENT/ACTIVITY**

VISUAL I-A (S)-18



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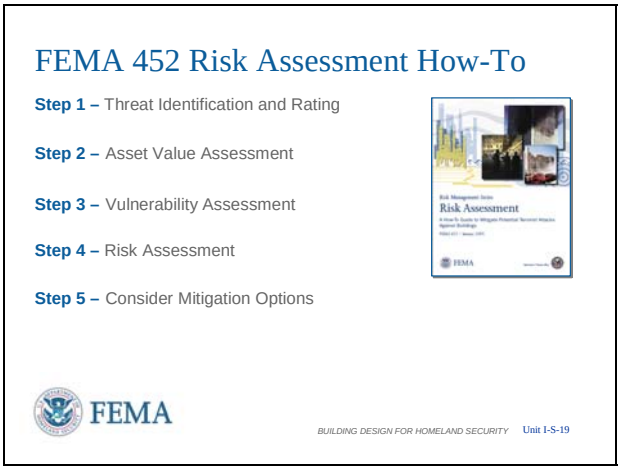


FEMA 426 - Chapter 5: CBR Measures

Chapter 5 presents chemical, biological, and radiological measures that can be taken to mitigate vulnerabilities and reduce associated risks for these terrorist tactics.

The concepts you should be familiar with at the end of the instruction include:

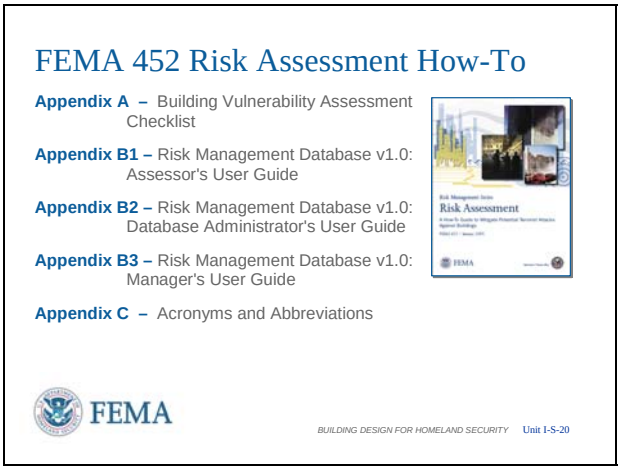
- Evacuation
- Sheltering in Place
- Personal Protective Equipment
- Filtering and Pressurization
- Exhausting and Purging

FEMA 452 Risk Assessment How-To

This publication expands Chapter 1 of FEMA 426 going into greater detail in each step of the risk assessment process as indicated by Steps 1 through 4. Step 5 takes an overarching view of mitigation options, looking at cost, benefit, special considerations, and the like, rather than going into specific mitigation options as done in Chapters 2 through 5 of FEMA 426.

INSTRUCTOR NOTES | **CONTENT/ACTIVITY**

VISUAL I-A (S)-20

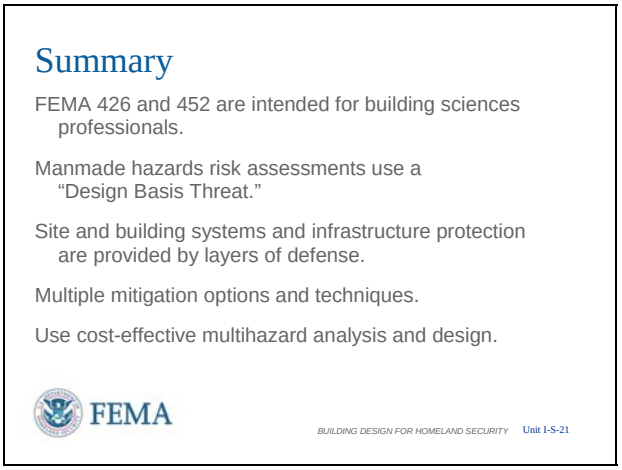


FEMA 452 Risk Assessment How-To Appendices

The manual also has five appendices to facilitate its use as a reference:

- Appendix **A** – Building Vulnerability Assessment Checklist [This is the same checklist as found at the end of Chapter 1 in FEMA 426]
- Appendices **B1, B2, and B3** – Different User Guides to use the **Version 1.0** of the FEMA 452 Risk Assessment Database that comes with FEMA 452 on the inside back cover. [This is the large organization version of the database for use on servers to facilitate access by tens and hundreds of people.]
- Appendix **C** – Acronyms and Abbreviations

VISUAL I-A (S)-21



Summary

- **FEMA 426 and 452** is intended for building sciences professionals, but can be used by anyone with basic understanding of the systems being assessed.

- Manmade hazards risk assessments use a "Design Basis Threat" and "Levels of Protection" for manmade disaster and loads versus building codes for natural disaster and loads.

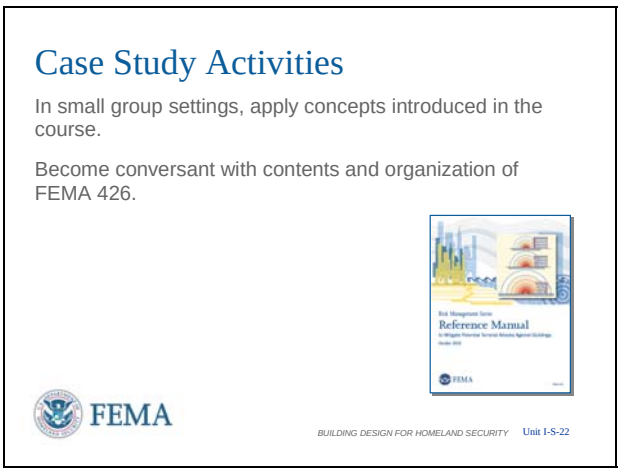
- Site and building systems and infrastructure protection are provided by layers of defense.

- Multiple mitigation options and techniques to deter, detect, deny, and devalue.

- Use cost-effective multihazard analysis and design.

INSTRUCTOR NOTES | **CONTENT/ACTIVITY**

VISUAL I-A (S)-22

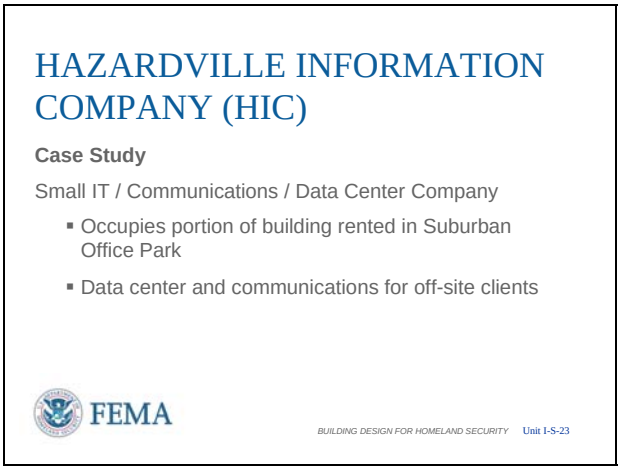


Case Study Activities

Through case studies in small group settings, students will become conversant with the contents and organization of **FEMA 426**.

- In small group settings, apply concepts introduced in the course
- Become conversant with contents and organization of FEMA 426

VISUAL I-A (S)-23



Introduction to the Case Study

The Case Study activities throughout this course provide opportunities, in a small group setting, to apply concepts introduced in each unit.

These activities will enable students to become conversant with **FEMA 426**, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings*.

Students will be able to use the document readily during the process of mitigating potential damage from terrorist attacks against buildings.

The activities are designed to "walk" students through the same assessment and design steps using a Case Study involving a hypothetical building and associated data about the threat environment.

Hazardville Information Company (HIC)

The Hazardville Information Company (HIC) is a fictional entity created for this course (see Appendix S of the Student Manual).

Divide students into small groups of 5 to 8, with 7 being the optimal. Greater than 8 leaves people out of the activity and tables are not usually large enough.

Students should work in these groups for the remainder of the small group sessions.

Refer students to the Unit I Case Study activity in the Student Manual.

Members of the instructor staff should be available to answer questions and assist groups

INSTRUCTOR NOTES | **CONTENT/ACTIVITY**

as needed.

- It is a composite of actual sites and buildings with actual systems typical of a number of commercial buildings.

The Case Study mainly addresses threat information related to manmade hazards:

- Explosive blast
- Chemical, biological, and radiological agents
- Armed attack
- Cyber attack

Each section of the Case Study activity includes:

- Examination of specific aspects of the Case Study data.
- Assessment of data and application to the Case Study of concepts and processes addressed in the unit.
- Completion of worksheets that demonstrate participant mastery of unit learning objectives.

VISUAL I-A (S)-24

Hazardville Information Company

General Student Activity Requirements

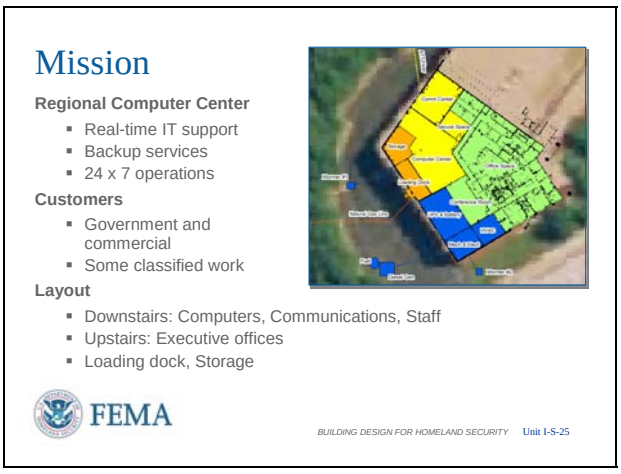
Each student is responsible for completion of his or her own worksheets.

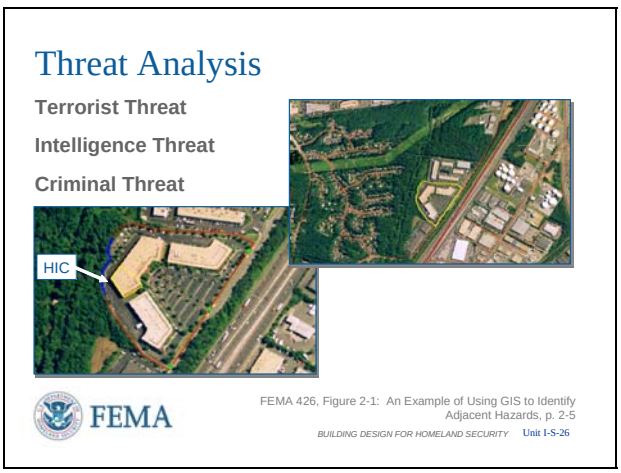
In addition, the small groups will produce a completed worksheet for each unit's activity and post results as applicable on the Risk Matrix Poster.

Group members are encouraged to discuss activity requirements and collaborate on completion of the worksheets.

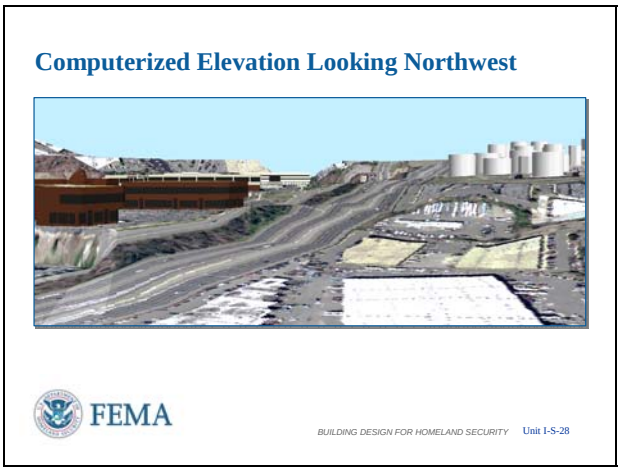
To facilitate this process, select a leader and a

INSTRUCTOR NOTES	CONTENT/ACTIVITY
	recorder. • Turn to Appendix S, the Suburban Case Study materials in the Student Manual and briefly peruse the document. • Use the Case Study data to answer worksheet questions, but feel free to ask questions based upon your experience.
VISUAL I-A (S)-25	**Hazardville Information Company** The Hazardville Information Company supports approximately 1,000 users and 100 applications as a primary data center and as a disaster recovery backup site. HIC has over 130 employees and approximately 80-100 employees are in the building at any given time.
VISUAL I-A (S)-26	**Threats/Hazards** • Terrorism • Intelligence • Crime Note the site location, terrain, parking, and other commercial buildings around HIC.



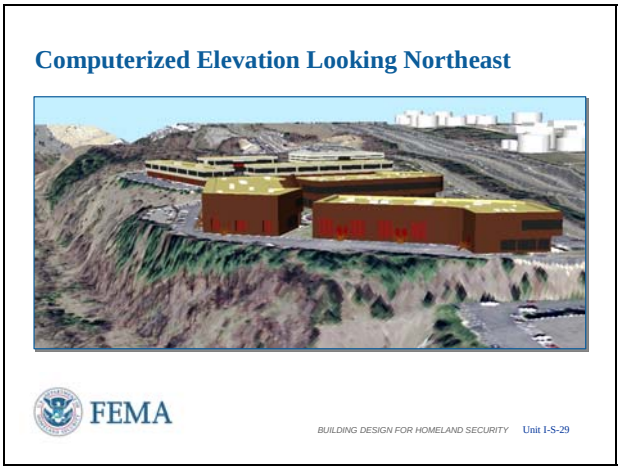


INSTRUCTOR NOTES	CONTENT/ACTIVITY
VISUAL I-A (S)-27	**Threats/Hazards** • HazMat • Natural Hazards Note the major interstate and rail lines near HIC.
VISUAL I-A (S)-28	**Computerized Elevation Looking Northwest** Note the elevation differences between the tank farm, the interstate, and the office park. A tank leak overflowing the berm around the tank could flow down the interstate, but unlikely that it would flow into the office park.



INSTRUCTOR NOTES | **CONTENT/ACTIVITY**

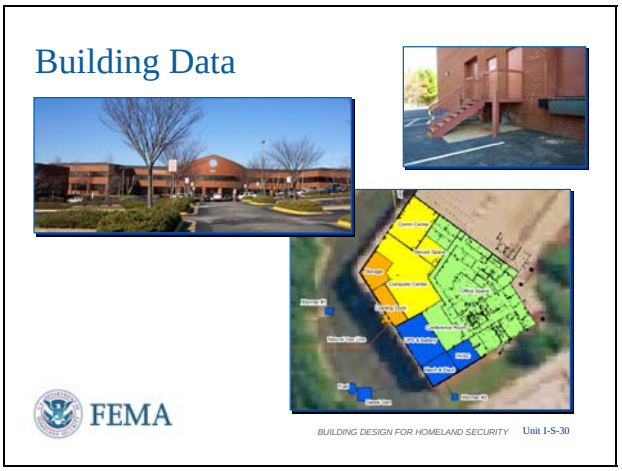
VISUAL I-A (S)-29



Computerized Elevation Looking Northeast

This slide shows the drop off behind the office complex which makes vehicle access very difficult from that direction.

VISUAL I-A (S)-30

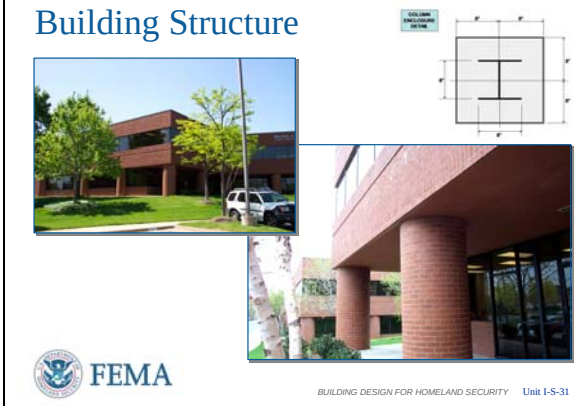
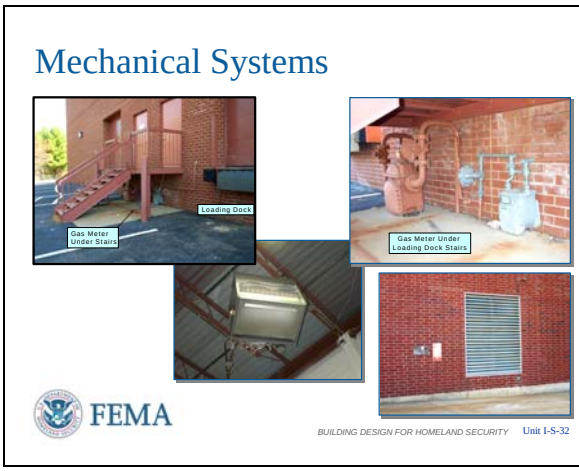


HIC Building Data

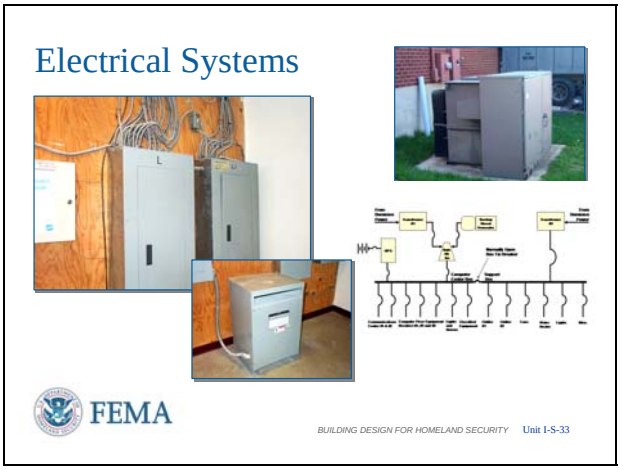
- Structural
- Mechanical
- Electrical
- IT
- Physical Security

Note the parking lot, building entry and exit access points, loading docks, building functions, and building infrastructure.

Also note that the interior columns have architectural standoff of about 4 inches per the graphic in the upper right corner.

INSTRUCTOR NOTES	CONTENT/ACTIVITY
VISUAL I-A (S)-31	**HIC Building Structure**
	The Case Study will review the building structure and envelope to identify vulnerabilities and mitigation options. Note the percentage of glass on the exterior walls, overhangs, and type of construction. Also note that the interior columns have architectural standoff of about 4 inches per the graphic in the upper right corner.
VISUAL I-A (S)-32	**HIC Mechanical Systems**
	The Case Study will review mechanical systems, plumbing, and piping to identify vulnerabilities and mitigation options. Note the exposed meter and ground level air intake.

INSTRUCTOR NOTES	CONTENT/ACTIVITY
VISUAL I-A (S)-33	**HIC Electrical Systems**



The Case Study will review primary electrical utilities and backup power to identify vulnerabilities and mitigation options.

Note the exposed electrical transformers, critical utility entry points, and redundancies, especially the two buss system and the tie breaker.

VISUAL I-A (S)-34

HIC Physical Security

The Case Study will review physical security systems, equipment, and procedures to identify vulnerabilities and mitigation options.

Note the locations of sensors, lights, access points, and type of badges or card readers.

INSTRUCTOR NOTES | **CONTENT/ACTIVITY**

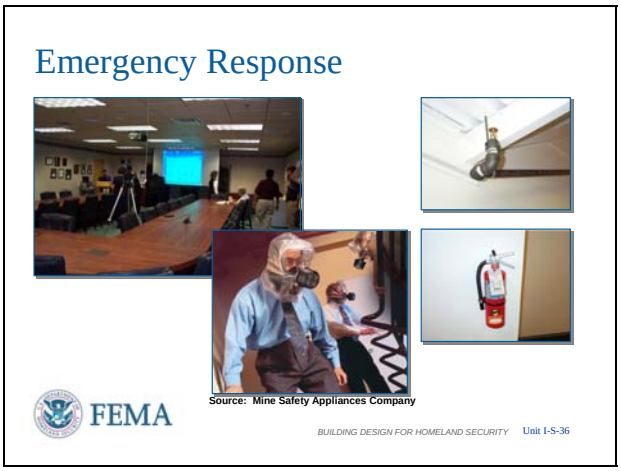
VISUAL I-A (S)-35

HIC IT Systems

The Case Study will review key IT systems to include the data center and communications to identify vulnerabilities and mitigation options.

Note the type of flooring, penetrations, mixed cable and fiber, racks.

VISUAL I-A (S)-36

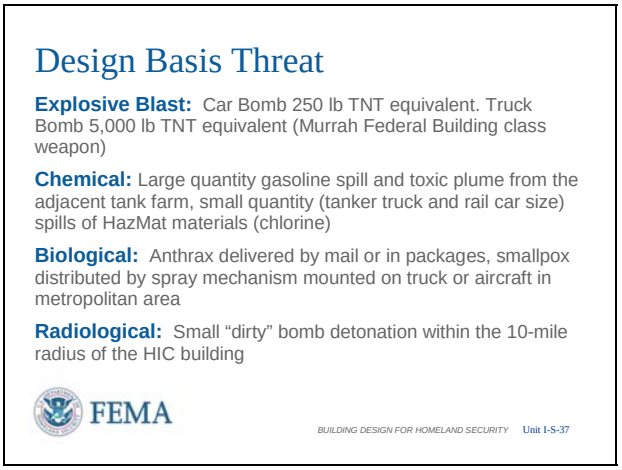


HIC Emergency Response

Determine the location, availability, and readiness condition of emergency response assets, and the state of training of building staff in their use.

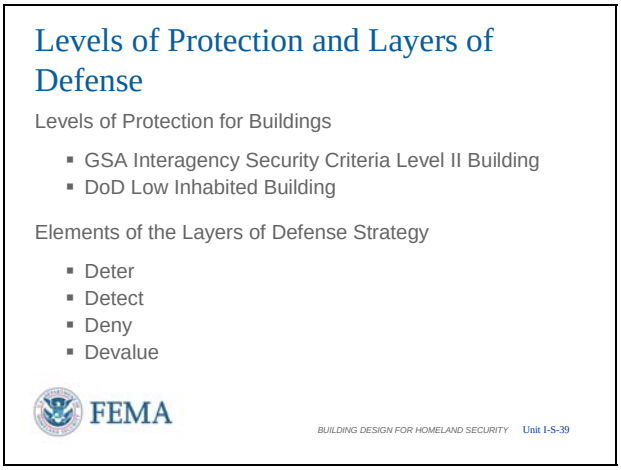
Note the location and type of protective equipment, safe haven or shelter in place options, and mass notification capability.

INSTRUCTOR NOTES	CONTENT/ACTIVITY
VISUAL I-A (S)-37	**Design Basis Threat** • Explosive Blast • Chemical • Biological • Radiological ("dirty" bomb)
VISUAL I-A (S)-38	**Design Basis Threat** • Criminal Activity/Armed Attack • Cyber Attack

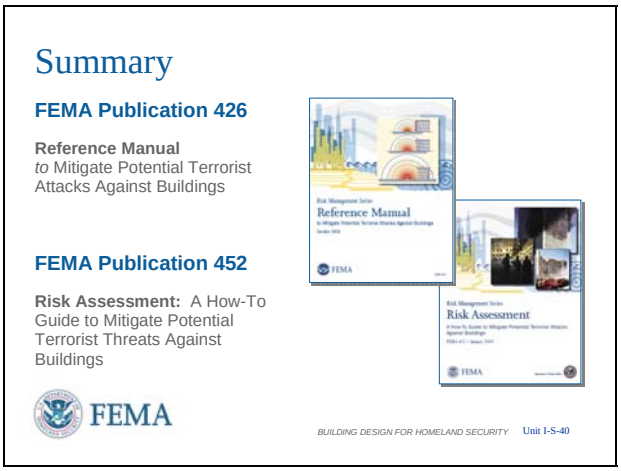


INSTRUCTOR NOTES | **CONTENT/ACTIVITY**

VISUAL I-A (S)-39



VISUAL I-A (S)-40



Exam Questions #A18 and B17

Levels of Protection and Layers of Defense

The Case Study will use both the GSA and DoD Levels of Protection to evaluate vulnerabilities against and to develop mitigation options.

A key design strategy and concept is "Layers of Defense." The elements of a layered system are:

- Deter
- Detect
- Deny
- Devalue

Summary

The objective of this course is to provide a comprehensive approach to reducing the physical damage to structural and non-structural components of buildings and related infrastructure, focusing on six specific types of facilities:

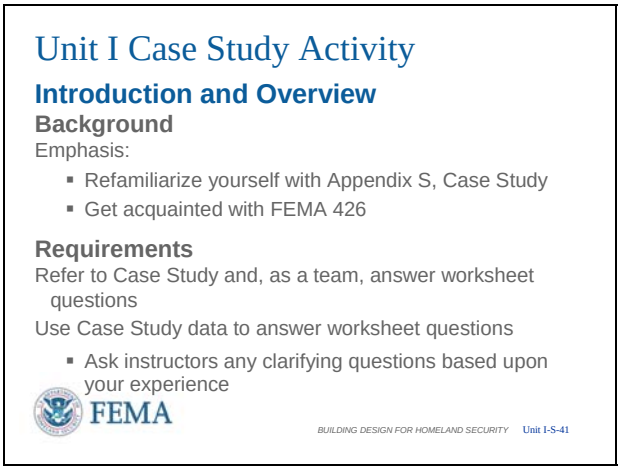
- Commercial office facilities
- Retail commercial facilities
- Light industrial and manufacturing
- Health care
- Local schools
- Higher education

Most importantly, the course provide participants with a solid foundation on:

- Design Basis Threat
- Levels of Protection
- Layers of Defense

INSTRUCTOR NOTES | **CONTENT/ACTIVITY**

VISUAL I-A (S)-41



At the end of 20 minutes, reconvene the class and facilitate group reporting in the plenary session.

Unit I Case Study Activity

Requirements

- Briefly refamiliarize yourself with CI/BC Case Study materials (Appendix C of the Student Manual)
- Read the questions on the Unit I Student Activity worksheet found in your Student Manual at the Unit 1 tab and, as a group, complete the worksheet.
- Use the Case Study data to answer worksheet questions, but feel free to ask clarifying questions from your experience.

Transition

In this course, you will learn how to perform a multihazard risk assessment of a building and become familiar with the key concepts to protect buildings from manmade threats and hazards:

- Asset Value
- Design Basis Threat
- Level of Protection
- Layers of Defense
- Vulnerability Assessment
- Risk Assessment
- Mitigation

Using the approach and guidance provided in **FEMA 426**, the majority of building owners should be able to complete a risk assessment of their building in a few days and identify the primary vulnerabilities, mitigation options, and make informed decisions on the ability of their building to survive, recover, and operate should an attack or event occur.

INSTRUCTOR NOTES	CONTENT/ACTIVITY
	For the rest of the first day, the course will introduce the components of risk and how to determine risk. • Unit II – Asset Value Assessment • Unit III – Threat/Hazard Assessment • Unit IV – Vulnerability Assessment • Unit V – Risk Assessment/Risk Management

UNIT I-A CASE STUDY ACTIVITY:
CASE STUDY OVERVIEW
HAZARDVILLE INFORMATION COMPANY (HIC)
(Suburban Version)

Requirements

Turn to Appendix S, Case Study, and briefly peruse the document. Read the "familiarization" questions on the following worksheet and, as a group, complete the worksheet. Use only the Case Study data to answer worksheet questions. Information has been limited in an effort to focus the activity. However, feel free to ask questions of the instructors based upon your experience.

Students should read the case study before attending a course offering, but if not, recommending reading it as soon as possible on the first day of class. During the first day of class students realize that the general reading is a good start, but assessment requires a more in depth analysis of content and functional and spatial inter-relationships to perform the student activities.

The answer to the first question is filled-in as an example.

Question	Answer	Page # in Case Study
1. What are the major transportation modes in the surrounding area?	A major interstate highway is located within ¼ mile of the HIC building. CSX Transportation and Norfolk-Southern Railway maintain a transportation corridor about ½ mile from HIC. There appear to be no restrictions on the material carried along these rail lines. Two airports are in the vicinity of HIC. One is a major international airport approximately 8 miles away. The other is a small, but busy general aviation airport less than 2 miles away.	A-3, A-32 – A-35
2. What life safety/ emergency response assets are available, and what are their response times?	• Wet pipe sprinkler system • 20 hand-held dry chemical fire extinguishers • Emergency generator for all functions • Fires station 2½ miles away. Seven others within 5 miles of the site. Response time: 8-10 minutes • Hospital 5 miles away	A-17, A-18 – A-20, A-30

3. What threats or hazards may affect HIC?	• Hazardous materials • Liquid fuels • Air traffic • Natural disasters • Manmade disasters (terrorist collateral damage or criminal threat)	A-6, A-31 – A-37
4. What are the prevalent weather/wind conditions at HIC?	The prevailing weather pattern for the area in the summer and fall is from the south Atlantic and the Gulf of Mexico. Warm, moist air brings thunderstorms and higher humidity. In the fall, cooler air from the north and west returns. Winter weather blasts across the state from the northern or central part of the continent. With no other weather activity, the prevailing wind is normally from the west-northwest.	A-6
5. What are the components of HIC's critical utility infrastructure ?	• Electrical systems (power to Computer Center) • Communications systems (data and voice between HIC and clients) • Gas supply (heat/humidity control to Computer Center) • Mechanical systems (cooling to Computer Center) • Water supply (cooling towers) • Emergency response systems (backup generator, alternate communications, etc.)	A-13 – A-22
6. What are the components of HIC's critical building infrastructure ?	• Parking • Entryways • Exits • Loading dock	A-4, A-5, A-11, A-12

7. What personnel are key to the operation of HIC?	The critical functions of HIC are: • Computer/data processing • Wired/wireless networking • Information Technology • Communications Of HIC's some 130 employees, the technical staff associated with Computer Center operations are the key personnel along with upper management/decision makers that provide the resources for these operations. Facility staff maintaining utilities that directly impact operations are also in this category.	A-23 – A-26