Risk Management Series

Risk Assessment

A How-To Guide to Mitigate Potential Terrorist Attacks Against Buildings

FEMA 452 / January 2005

FEMA

Department of Veterans Affairs

FEMA 452 / *January 2005*

RISK MANAGEMENT SERIES

Risk Assessment
A How-To Guide to Mitigate Potential Terrorist Attacks Against Buildings

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FOREWORD AND ACKNOWLEDGMENTS

BACKGROUND

The Federal Emergency Management Agency (FEMA) developed this Risk Assessment, A How-To Guide to *Mitigate Potential Terrorist Attacks Against Buildings,* to provide a clear, flexible, and comprehensive methodology to prepare a risk assessment. The intended audience includes the building sciences community of architects and engineers working for private institutions, building owners/operators/managers, and State and local government officials working in the building sciences community.

OBJECTIVE AND SCOPE

The objective of this How-To Guide is to outline methods for identifying the critical assets and functions within buildings, determining the threats to those assets, and assessing the vulnerabilities associated with those threats. Based on those considerations, the methods presented in this How-To Guide provide a means to assess the risk to the assets and to make risk-based decisions on how to mitigate those risks. The scope of the methods includes reducing physical damage to structural and non-structural components of buildings and related infrastructure, and reducing resultant casualties during conventional bomb attacks, as well as chemical, biological, and radiological (CBR) agents. This document is written as a How-To Guide. It presents five steps and multiple tasks within each step that will lead you through a process for conducting a risk assessment and selecting mitigation options. It discusses what information is required to conduct a risk assessment, how and where to obtain it, and how to use it to calculate a risk score against each selected threat.

This is one of a series of publications that address security issues in high-population, private sector buildings. This document is a companion to the *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings* (FEMA 426) and the Building Design for Homeland Security Training Course (FEMA E155). This document also leverages information contained within the *Primer for Design of Commercial Buildings to Mitigate Terrorist Attacks (*FEMA 427).

The primary use of this risk assessment methodology is for buildings, although it could be adapted for other types of critical infrastructure.

The foundation of the risk assessment methodology presented in this document is based on the approach that was developed for the Department of Veterans Affairs (VA) through the National Institute for Building Sciences

(NIBS). Over 150 buildings have been successfully assessed using this technique. The risk assessment methodology presented in this publication has been refined by FEMA for this audience.

The purpose of this How-To Guide is to provide a methodology for risk assessment to the building sciences community working for private institutions. It is up to the decision-makers to decide which types of threats they wish to protect against and which mitigation options are feasible and cost-effective.

This How-To Guide views as critical that a team created to assess a particular building will be composed of professionals capable of evaluating different parts of the building. They should be senior individuals who have a breadth and depth of experience in the areas of civil, electrical, and mechanical engineering; architecture; site planning and security engineering; and how security and antiterrorism considerations affect site and building design.

The information contained in this document is:

- not mandatory
- not applicable to all buildings
- not applicable when it interferes with other hazards such as fire

ORGANIZATION AND CONTENT

In order to create a safe environment, many factors must be considered. Figure 1 depicts the risk assessment process presented in this document to help identify the best and most cost-effective terrorism mitigation measures for a building's own unique security needs. The first step is to conduct a threat assessment wherein the threat or hazard is identified, defined, and quantified (Step 1). For terrorism, the threat is the aggressors (people or groups) that are known to exist and that have the capability and a history of using hostile actions, or that have expressed intentions for using hostile actions against potential targets as well as on whom there is current credible information on targeting activity (surveillance of potential targets) or indications of preparation for terrorist acts. The capabilities and histories of the aggressors include the tactics they have used to achieve their ends. The next step of the assessment process is to identify the value of a building's assets that need to be protected (Step 2).

After conducting a asset value assessment, the next step is to conduct a vulner-

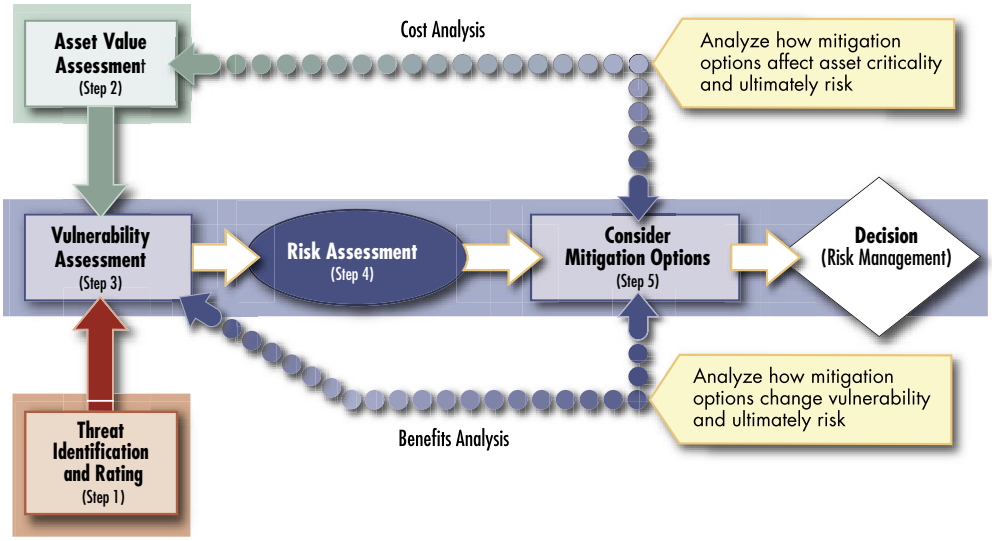

Figure 1 Risk assessment process model

ability assessment (Step 3). A vulnerability assessment evaluates the potential vulnerability of the critical assets against a broad range of identified threats/hazards. In and of itself, the vulnerability assessment provides a basis for determining mitigation measures for protection of the critical assets. The vulnerability assessment is the bridge in the methodology between threat/hazard, asset value, and the resultant level of risk.

The next step of the process is the risk assessment (Step 4). The risk assessment analyzes the threat, asset value, and vulnerability to ascertain the level of risk for each critical asset against each applicable threat. Inherent in this is the likelihood or probability of the threat occurring and the consequences of the occurrence. Thus, a very high likelihood of occurrence with very small consequences may require simple low cost mitigation measures, but a very low likelihood of occurrence with very grave consequences may require more costly and complex mitigation measures. The risk assessment should provide a relative risk profile. High-risk combinations of assets against associated threats, with the identified vulnerability, allow prioritization of resources to implement mitigation measures.

The final step (Step 5) is to consider mitigation options that are directly associated with, and responsive to, the major risks identified during Step 4. From Step 5, decisions can be made as to where to minimize the risks and how to accomplish that over time. This is commonly referred to as Risk Management.

A number of worksheets are utilized in this How-To Guide. They can be used to apply key concepts described in this document and are presented at the end of each Step.

A core element of this How-To Guide is the Building Vulnerability Assessment Checklist included in Appendix A. The Checklist can be used to collect and report information related to the building infrastructure. It compiles many best practices based on technologies and scientific research to consider during the design of a new building or renovation of an existing building. It allows a consistent security evaluation of designs at various levels.

A Risk Assessment Database accompanies this publication in the form of computer software. The purpose of this database is for a user to collect and organize risk scoring, building vulnerability data, and mitigation measures for multiple buildings. More information can be found throughout this publication and in Appendix B.

The Building Vulnerability Assessment Checklist and the Risk Assessment Database were developed for the Department of Veterans Affairs with assistance from the National Institute for Building Sciences.

ACKNOWLEDGMENTS

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This How-To Guide was prepared under contract to FEMA. It will be revised periodically, and comments and feedback to improve future editions are welcome. Please send comments and feedback by e-mail to riskmanagementseriespubs@dhs.gov.

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