

Critical Infrastructure Protection

Water

**Volume I:
Five Step Process to
Define Threats, Develop &
Implement the Security Plan**



Don Philpott, Walter Presson Jr., and Cynthia Presson

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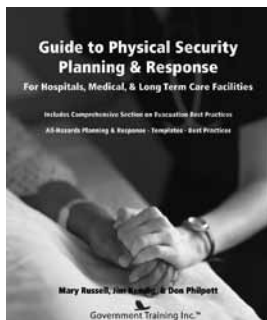
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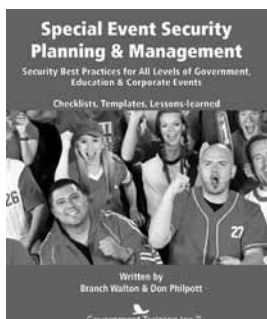
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Guide to Physical Security Planning & Response For Hospitals, Medical, & Long Term Care Facilities

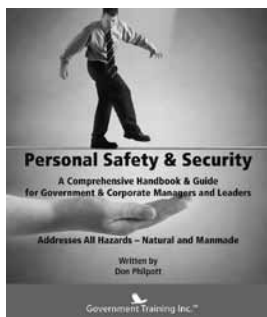
This new—and timely—comprehensive guide is an A-to-Z of all-hazards planning for all healthcare facilities. While it is focused on hospitals, the guidance and procedures covered are equally relevant for nursing homes, assisted living facilities, and special needs homes.

It is written by Florida experts who have enormous experience in emergency planning and evacuation having tackled major hurricanes and mass evacuations several times. Their expertise and lessons learned are documented throughout the book so that you can benefit from them.



Special Event Security Planning & Management Security Best Practices for All Levels of Government, Education & Corporate Events

Don Philpott, a recognized international writer on security solutions, and Branch Walton, former U.S. Secret Service and corporate security advisor, have teamed-up to bring to the reader security best practices for events planning. The book draws on national and regional events lessons-learned and “right-sized” planning for all levels of government, education and corporate events. From local parades and public events to major sports and entertainment—all can use this practical guide.



Personal Safety & Security A Comprehensive Handbook & Guide for Government & Corporate Managers and Leaders

We all have a duty to our families, friends and loved ones to ensure that the places where we live, work, learn and play are secure, and that the people using them are safe.

The aim of this Handbook is not to alarm you, but to prepare and protect you. In the event of a disaster or terrorist incident, first responders may not be able to get to you immediately. Our goal is to give you the information you need so that you are aware of the various threats you face and how to recognize and respond to them.



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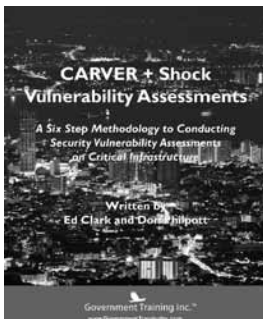


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How to Anticipate and Plan For, React To, and Communicate During a Crisis

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If people know what to do, they can get on with performing their designated tasks immediately and, as a team, tackle the problem and get back to normal as quickly as possible.



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The Integrated Physical Security Handbook II

2nd Edition

5-Step Process to Assess and Secure Critical Infrastructure From All Hazards Threats

This new edition covers a number of additional areas including convergence of systems, building modeling, emergency procedures, privacy issues, cloud computing, shelters and safe areas, and disaster planning. There is also a comprehensive glossary as well as access to a dedicated website at www.physicalsecurityhandbook.com that provides purchasers of the book an online library of over 300 pages of additional reference materials.



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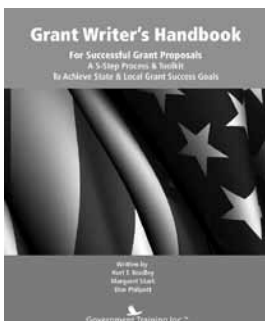
Developing the Positive, Healthy & Safe Workplace **A 7-Step Management Process Leading to a Culture of Personnel Safety & Security**

Rita Rizzo is a nationally recognized expert on all aspects of workplace quality, employee development, leadership and workplace security. Her thought-provoking seminars and books have brought practical solutions to the challenges of leadership. In the book, Rita presents a 7-step process for use by management and staff to create a positive, healthy, and safe workplace.



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Symbols

Throughout this book you will see a number of icons displayed. The icons are there to help you as you work through the Six Step process. Each icon acts as an advisory – for instance alerting you to things that you must always do or should never do. The icons used are:



This is something that you must always do



This is something you should never do



Really useful tips



Points to bear in mind



Have you checked off or answered everything on this list?

About the Authors

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Acknowledgements

This manual has drawn heavily upon the authoritative materials published by the Federal Emergency Management Agency (FEMA), Department of Homeland Security (DHS), Government Accountability Office (GAO), General Services Administration (GSA), Environmental Protection Agency (EPA) and many other state and federal agencies. These materials are in the public domain and accreditation has been given both in the text and in the reference section. In some instances, when official reports are being mentioned in this book, opinions are stated. These are the opinions of expert witnesses and members of the report's panel, not the opinions of the authors. They are included, however, because they do contribute to the debate on protecting the nation's water infrastructure.

This book is based on the unique five step process developed for the Integrated Physical Security Handbook (Government Training, Inc.) for protecting the nation's critical infrastructure.

Introduction

In general, the threat of drinking water contamination through terrorist activities is small. To be effective, most contaminants would need to be used in very large quantities, thereby minimizing an actual threat, and treatment processes already in place will deactivate many contaminants. Also, following 9/11, drinking water utilities across the nation were alerted about the need to increase security and have augmented surveillance and protection measures.

The primary threats to the Nation's drinking water supplies are contamination by chemical, biological or radiological agents; damage, destruction, or sabotage of physical infrastructure; and disruption to computer systems. Generally, biological agents considered to be weapons of mass destruction pose the most danger in aerosol form (i.e. direct exposure to pathogens transported in the air).

There are also threats from natural disasters such as hurricanes, earthquakes and floods. All of these issues have to be taken into account when developing an effecting emergency response plan that must cover every eventuality.

The water sector consists of two basic components: potable water supplies and wastewater collection and treatment. According to EPA there are approximately 53,000 community water systems in the United States. EPA's data reflects that ownership of these systems is evenly split—about half are publicly owned by state and local authorities and about half are privately owned.

According to EPA, the majority of the U.S. population gets its water from publicly owned systems.

Community water systems vary by size and other factors but most typically include a supply source, such as surface water or groundwater, a treatment facility, which uses (and stores) chemicals such as chlorine, lime, etc. to eliminate pathogens and reduce taste and odor problems, and a distribu-

tion system which includes water storage towers, piping grids, valves, pumps, and other components necessary to deliver treated potable water to consumers. Community water systems often contain many miles of pipe with numerous access points that may be vulnerable to terrorist attack.

The USA PATRIOT Act defines critical infrastructure as those “systems and assets . . . so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security, national economic security, national public health or safety, or any combination of those matters.”

The National Strategy for Homeland Security grouped the critical infrastructure of the United States into 13 sectors—agriculture, banking and finance, chemical, defense industrial base, emergency services, energy, food, government, information and telecommunications, postal and shipping, public health, transportation, and water sectors.



Remember

These systems are often taken for granted because they are so basic to our daily lives that we only notice them when our service is disrupted.

President Bush designated a lead agency for each of the 13 sectors to coordinate interaction between the federal government and the private sectors. The lead agency for the chemical sector is the Department of Homeland Security (DHS) and the lead agency for the water sector is the Environmental Protection Agency (EPA).

There are about 15,000 critical facilities—including chemical, water, energy, and other sectors—that produce, use, or store more than threshold amounts of chemicals the EPA has estimated pose the greatest risk to human health and the environment. Of these 15,000 facilities, DHS estimates there are about 4,000 chemical manufacturing facilities. There are approximately 53,000 community drinking water systems and more than 2,900 maritime facilities that are required to comply with certain provisions of the Maritime Transportation Security Act of 2002 (MTSA).

In addition, there are approximately 77,000 dams and reservoirs, thousands of miles of pipes, aqueducts, water distribution and sewer lines, 168,000 public drinking water facilities and about 16,000 publicly owned wastewater treatment facilities (POTWs). The federal government has ownership responsibility for hundreds of dams and diversion structures, but the vast majority of the nation's water infrastructure is either privately or publicly owned by non-federal units of government.

Terrorist attacks upon our nation's infrastructure could have a significant impact on the health and safety of millions of Americans and result in environmental damage and/or economic disruption.

The public and private sectors are working diligently to secure critical assets in chemical, water, and maritime facilities, but much more is necessary to guarantee the safety and security of the nation's critical water infrastructure.

- In the United States, water utilities treat nearly 34 billion gallons of water every day.
- In the United States and Canada, there are approximately one million miles of water pipeline and aqueducts - enough to encircle the globe 40 times.
- Americans consume more than one billion glasses of tap water per day
- From birth to 6 months, children consume seven times as much water per pound as the average American adult.

The following five step process was developed by Shuki Einstein and myself for our *Integrated Physical Security Handbook*.

In order to carry out a comprehensive assessment of facility necessities, an understanding of the basic elements of security is required- what you are protecting and how vulnerable it is. Knowledge and understanding of threat sources and mitigation and principles of deterrence, detection, delay, response, recovery and re-evaluation is critical, along with all available options Armed with this knowledge you can develop and implement the most appropriate integrated physical security plan for your facility.

When planning, there are two scenarios – if and when. The “if” scenario covers planning and procedures to prevent the likelihood of an incident. The “when” scenario covers planning and response procedures after an incident and is mainly concerned with mitigation and recovery.

Remember that the cost to mitigate and recover may be less than the cost to protect so there must always be a balance between protection and mitigation and an analysis of both.

Step One – Your Model Secure Facility

Now that you have an understanding of basic security techniques and applications relating to facility protection, at the next step is consideration of a model secure facility – the facility that in a perfect world is able to maximize security without compromising business as usual. Many methodologies omit this step, but we believe it is important to examine what would constitute a model secure facility for you; one which has identified its core functions, critical assets, threats and vulnerabilities and taken the appropriate measures to mitigate them. Above all, it is a facility that is secure yet one that is able to carry on its core function efficiently and effectively. Once you have identified your model facility, you have a benchmark for comparison.

Step Two - Gap Analysis: How do you compare with the model facility?

The goal of physical security is to protect facilities and the assets contained therein. The most important of these assets is, of course, the people. Items to be identified initially include:

- ▶ assets to be protected.
- ▶ threats to those assets.
- ▶ vulnerability of those assets
- ▶ priorities

Fact: 85% of all critical infrastructures and key resources in the U.S. are privately-owned.

What Am I Protecting?

Protective systems should be developed for specific assets. Assets are anything key to your mission that can be destroyed, damaged or stolen. The risk-analysis procedure is used to identify assets –from the building itself to hazardous materials, equipment, supplies, furniture, computers, IT infrastructure and, of course, people.

Identification of core functions will enable you to identify the specific critical infrastructure to be protected in order to maintain operations in the event of an attack.

Differing layers of security may be necessary in various parts of the facility based upon the value of the assets located there. For instance, there should be relatively free access to the kitchen/lunch room but much greater restricted access to the computer network control room.

Asset value is determined by considering the following three elements:

- ▶ criticality of the asset
- ▶ ease of replacement.
- ▶ measure of relative value.

Who Are My Adversaries?

It is important to identify and characterize both internal and external threats to these assets either from within or without the facility. Internal threats include pilfering of office equipment, theft of classified information or disgruntled employees who may sabotage equipment, disrupt operations, or physically harm other employees. External threats range from break-ins, vandalism and theft to acts of terrorism. It is important to understand your adversaries' tactics, motivations and capabilities. Consult your local police, the FBI and other agencies that monitor identified and potential threats. They can advise on possible threats, their source, and what methods and weapons may be utilized.

Other resources include:

- ▶ **Design Base Threat (DBT)** – analysis to help identify likely adversaries, their strengths and capabilities, potential targets and the likelihood and method of attack.
- ▶ **Crime Prevention Through Environmental Design (CPTED)** – a tried and trusted methodology which takes into account the relationship between the physical environment its users. It is a useful tool in identifying potential crimes and their perpetrators.

Where Am I Vulnerable?

A useful method of identifying threats is to conduct scenario- based assessments. This is an extremely analytical process that employs the identification of critical flaws and weak points in your current physical protection through the development of multiple “what if” scenarios. By working through various scenarios and determining probable actions and consequences, you can then develop plans to counter or mitigate them.



Must Do

Until you discover your areas of vulnerability, you cannot develop strategies to protect them.

Use the model facility as your benchmark to identify areas of your facility that need attention. Conduct an audit of your facility – site boundaries, building construction, room locations, access points, operating conditions (working hours, off-hours, etc.), existing physical protection features, safety considerations and types and numbers of employees and visitors.

Next, determine all critical assets, tangible and intangible- equipment, personnel and materials. This analysis should also include facility /employer reputation, employee morale and proprietary information.

You must identify and characterize vulnerabilities that would allow potential threats to be realized. A major problem for buildings in urban areas is lack of a secure perimeter, enabling a vehicle containing a bomb to approach within several feet of a building, causing major damage upon detonation. Internal vulnerabilities include poorly trained security staff and lack of access controls to sensitive parts of the building.

Include an assessment of the impact of an incident at a nearby facility—a chemical spill for instance—and necessary steps to protect your property and people.

By identifying weaknesses you can develop solutions to reduce or eliminate them.

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What Are My Priorities?

Risk assessment must take into account the impact on your business or operation if assets are destroyed or damaged. Part of that assessment is to rate the impact of the loss as low, medium or high. This will identify critical assets requiring maximum protection.

How do I compare?

Once you have established critical assets, potential threats, areas of vulnerability and protection priorities, you are in a position to perform a Gap Analysis to identify steps to reduce risk, increase safety and provide necessary physical security for your facility by comparison to the model facility..

Step Three - Gap Closure

Having identified your deficiencies, you must then consider and evaluate all available options to mitigate the threats. There is a vast array of systems and devices available and you must determine the best options for your particular circumstances and budget. If you have questions about products and services, it is best to consult an independent security consultant rather than a vendor with a vested interest in sales.

General options are described as follows:

1) Perimeter Security

Securing the perimeter, stopping or delaying entry, surveillance and detection, protection basics, defense measures, standoff distances and responses to reduce security risks.

2) Vehicles

Protecting approaches, controlling access and parking, installing barriers, surveillance and other monitoring equipment.

3) Internal Security

Access controls, alarms and barriers, authentication devices and screening, access biometrics, CCTV, hot site protection, safe mail rooms, coping with hazards, etc..

4) Information Technology

Integrating IT, cyber and physical security planning, providing network/infrastructure protection and protecting files, document and other critical resources.

5) Personnel

- ▶ **Security Staff** - requirements/hiring/screening/training, security programs and responses
- ▶ **Staff/visitors** - screening/training/informing; drills/evacuation/safe rooms; alarms/staging areas; communications and coping with and recovering from an event.
- ▶ **Special needs** - ADA requirements and special resources.

6) Building Design/Security

Building codes, exits/fences/gates/doors/barriers; windows, critical floor space/safe rooms/safe areas; devices/detectors; lighting, cameras and maintenance.

7) Community Risk Assessment/ Involvement

Assessing local risks and incorporating into planning; working with fire/police/EMS, local businesses and residents.

8) Technology Solutions

The handbook deals with the various security and defense devices available to you. These are referred to in Security 101 and the Gap Analysis and Gap Closure chapters in general terms. References are provided throughout the book for more comprehensive information should you need it.

Step Four - Strategic Plan

Having identified assets, adversaries, threats & vulnerabilities and determined priorities and options, you are in a position to plan and strategize the security change process. This means developing



Remember

The strategic plan serves two critical functions: it is the marketing tool you need to get management approval and it is the blueprint for your physical security plan.

a road map; plotting how to get where you want to be from where you are. The strategic plan sets out Steps Two and Three above – documenting your Gap Analysis, identifying critical assets, threats and weaknesses and all areas needing to be addressed. The Gap Closure documents how you plan to close those gaps, the justification for the actions to be taken, costs involved and timeframe for implementation.

Step Five - Implementation

Once your Strategic Plan has been approved, it must be implemented. This includes project management, bid contracting and vendor selection, quality assurance and quality control and revising policy procedures.

Integrated physical security planning is an ongoing requirement. Once your system is in place you must continuously test it for weaknesses and vulnerabilities and ensure that your employees understand why the measures are in place and their roles in the event of an emergency.

Re-analyze – what is my current situation? Ask yourself what has changed and what new threats have emerged since your last review. By regularly tracking and monitoring your integrated physical security system you can close gaps and introduce enhancements.

The following section may be used as a general reference in establishing a safe, secure facility.

10 Key Features of an Active and Effective Security program

1. Integrate protective concepts into organizational culture, leadership, and daily operations. Foster attentiveness to protection in the day-to-day thinking of front-line workers, emergency responders, management, and senior leadership. Identify employees responsible for implementing security priorities.
2. Identify and support security program priorities, resources, and utility-specific measures. Dedicate resources to specific protection needs through annual capital, operations and maintenance budgets, and/or staff resource plans. Develop measures appropriate to utility-specific circumstances and operating conditions
3. Employ protocols for detection of contamination. Establish working relationships with local, state, and public health communities to detect public health anomalies and evaluate them for contamination implications. Track, characterize, and analyze customer complaints to identify potential contamination events.
4. Assess risks and review vulnerability assessments (VAs) .Maintain current understanding and assessment of threats, vulnerabilities, and consequences. Establish and implement a schedule for review of threats, vulnerabilities, and consequences and their impact on the vulnerability assessment at least every 2-3 years to account for factors such as facility expansion/upgrades, community growth and advancing technology.
5. Establish facility and information access control. Implement physical and procedural controls to restrict utility access to authorized personnel only. Define, identify, and restrict access to security-sensitive information (both electronic and hard copy) for utility operations and technical details.
6. Incorporate resiliency concepts into physical infrastructure. Include security program considerations early in the design, planning, and budgeting processes to mitigate vulnerability and/or potential consequences and improve resiliency. Develop design and construction specifications that address both physical hardening of sensitive infrastructure and adoption of inherently lower risk technologies and approaches where feasible.
7. Prepare, test, and update emergency response and business continuity plans. Understand, train personnel, and implement National Incident Management System (NIMS) guidelines and Incident Command Systems (ICS). Review and update emergency plans annually and test those plans through tabletop, functional, and full-scale exercises.
8. Develop partnerships with first responders, managers of critical interdependent infrastructure, other utilities, and ancillary response organizations. Forge partnerships in advance of an emergency, ensuring utilities and key partners are better prepared to work together if an incident should occur. Establish relationships with critical customers (hospitals, manufacturing, first responders, etc.) to identify interdependency issues that may impact business continuity and utilize state Water/Wastewater agency Response Network (WARN) systems where available.

9. Develop and implement internal and external communication strategies. Motivate staff to support security program strategies and goals. Prepare key messages for various types of emergencies and determine how those messages should be delivered to the community and by whom.
10. Monitor local, regional, national and global incidents and threat-level information. Develop systems to access threat information, identify threat levels, and determine specific response actions (e.g., WaterISAC).