CBRN and Hazmat Incidents at Major Public Events

Planning and Response

Dan Kaszeta
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Acknowledgments

No book like this is possible without the help of others. I have many people to thank. It's not possible to get to a point twenty years into a career without having learned a lot from a lot of different people. In my case, there are too many to name. There are even some people who did the wrong thing, and I learned from them too by knowing what not to do.

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Contents

Acknowledgments ................................................................. v
Foreword ................................................................. xiii

PART I
Introduction

CHAPTER 1 The Threat Environment ................................................. 7
Adverse Effects ................................................................. 7
Causative Agents: The Spectrum of CBRN/HAZMAT Substances .......... 10
Means of Dissemination ..................................................... 16
Causative Agents: the Perpetrator ........................................ 19
Multipliers in the Major Event Environment ......................... 19
Nuisances, Hoaxes, and Communicated Threats .................... 22
CBRN/HAZMAT Substances: Characteristics Significant as Planning Considerations .................................. 24

CHAPTER 2 Differing Perspectives and Philosophies on CBRN/HAZMAT Planning and Response ............... 29
Fire Service and HAZMAT ................................................ 29
Military CBRN Defense Philosophy .................................... 32
Perspective of Police, Law Enforcement, and Security Services ........ 34
The Private Security Provider’s Perspective ......................... 37
Medical Perspective ......................................................... 38
Scientific and Laboratory Perspective .................................. 40
# CONTENTS

## PART II

### General Planning and Preparedness Efforts

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td><strong>CBRN in Context: Interagency Planning and Cooperation</strong></td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Swimming in the Sea: Keeping CBRN/HAZMAT in Context</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>The Safety and Security Bureaucracy: The Sea in Which We Swim</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Interagency Planning and Coordination</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>Incident Management Systems</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>The Operations Center</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>Best Practices</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>Common Language</td>
<td>67</td>
</tr>
<tr>
<td>4</td>
<td><strong>General Planning Considerations at an Early Stage</strong></td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>Establish your Planning Threshold</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>Reconnaissance: Site Surveys and Walkthroughs</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>Resilience</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td>Legal Considerations</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Communications</td>
<td>80</td>
</tr>
<tr>
<td>5</td>
<td><strong>Building Capability and Capacity</strong></td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>Survey the Existing Capability</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>Surveying Capacity</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>The Synchronization Matrix as a Planning Tool</td>
<td>86</td>
</tr>
<tr>
<td></td>
<td>Assessment Schemes</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>Training and Exercises</td>
<td>96</td>
</tr>
<tr>
<td>6</td>
<td><strong>Equipment Procurement</strong></td>
<td>101</td>
</tr>
<tr>
<td></td>
<td>Preparing for the Onslaught of Vendors</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td>Hazard Prediction—Is it Useful?</td>
<td>104</td>
</tr>
<tr>
<td></td>
<td>Sensors: Surveillance and Warning</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td>Protection Technology</td>
<td>113</td>
</tr>
<tr>
<td>7</td>
<td><strong>Dealing with Event Venues</strong></td>
<td>117</td>
</tr>
<tr>
<td></td>
<td>Major Types of Venue</td>
<td>117</td>
</tr>
<tr>
<td></td>
<td>Architectural, Structural, and Construction considerations</td>
<td>122</td>
</tr>
<tr>
<td></td>
<td>Planning Considerations for Building Construction</td>
<td>123</td>
</tr>
<tr>
<td></td>
<td>Securing Venues</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td>Venue Search</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>Screening People</td>
<td>130</td>
</tr>
<tr>
<td></td>
<td>Screening Goods and Vehicles</td>
<td>132</td>
</tr>
</tbody>
</table>
PART III

The Response Disciplines

CHAPTER 8 Medical Preparedness .................................................. 139
How will CBRN/HAZMAT Present itself to the Medical System? .......... 139
The Concept of "Special Events Medical Services" .......................... 142
General Planning Considerations ............................................. 144
Mass Casualty Planning ......................................................... 145
Hospital Decontamination ..................................................... 147
Medical Surveillance ............................................................. 149
Dealing with the "Worried Well" .............................................. 150

CHAPTER 9 Police, Law Enforcement, Intelligence,
and Security Preparedness ...................................................... 155
Breaking the Cycle: Disrupting the Process of Terrorism ................. 155
Preparing to Operate in a CBRN/HAZMAT Environment ............... 162

CHAPTER 10 Preparedness for the
Fire and HAZMAT Sector .......................................................... 167
Adapting the Response to the Major Event Environment ............... 167
Decontamination ........................................................................ 171
Search and Rescue in the Hot Zone? .......................................... 172
Keeping the Detectives Happy: Learning not to Wreck the Crime Scene .. 176

CHAPTER 11 The Military: Preparing for
Military Support to Civil Authorities .......................................... 179
The Nature of Military Support to Civil Authorities ...................... 179
Types of Military Support to CBRN/HAZMAT Incidents ................. 180
Some Issues and Problems with Military Support ....................... 183
Some Ideas to Integrate Military Support .................................. 187

CHAPTER 12 Preparedness for Everybody Else ......................... 189
Public Transportation and Transport Infrastructure ..................... 189
Financial and Administrative Preparedness ................................ 190
Explosive Ordnance Disposal and Bomb Squad .......................... 190
Legal Preparedness ................................................................. 192
Preparedness for Event and Venue Management ........................ 193
Laboratory and Scientific Preparedness .................................... 194
Reach-Back ............................................................................... 198
VIP Protection Considerations ............................................... 199
PART IV
Response

CHAPTER 13 Initial Assessment and Response
The Golden Hour
Initial Assessment of the Incident
Arriving on Scene: Managing the Incident with GEDAPER
Tactics for the Incident Commander and Responder

CHAPTER 14 Detection, Measurement, and Identification of Hazards
Concepts and Definitions
"Primitive" and "Nonspecific" Sensors
Chemical and HAZMAT Sensors
Biological Sensors
Radiological and Nuclear Sensors
Integrating Detection and Identification into Operations
Best Practices for Major Events
What Not to Do

CHAPTER 15 Medical Response
How Will the CBRN/HAZMAT Patient Look?
Managing the Incident: Being Realistic in Chemical Scenarios
Field Care: Remember the ABCDD
Alphabet Soup: Managing the ABCDD in an MCI
Definitive Care: the Larger Picture

CHAPTER 16 Decontamination
Why do Decontamination?
Issues and Arguments Surrounding Decon.
Categories of Decontamination
Methods of Decontamination
Decontamination: Planning Considerations and Tactics

CHAPTER 17 Law Enforcement and Security Response
Scene Control and Public Order Issues
Intervention Scenarios
Forensics: Collection and Preservation of Criminal Evidence
The Crime Scene
Collecting Evidence at a Contaminated Crime Scene
CHAPTER 18 Consequence Management and Other Related Measures ........................................297
Consequence Management ..................................................297
Public and Media Affairs ......................................................299
Dealing with the Dead .........................................................301
Volunteers and “Unaffiliated Responders” ..................................303
References .................................................................305

PART V Practical Scenarios

SCENARIO A The Venue Search ..................................................311
SCENARIO B Screening People, Vehicles, and Goods ......................317
SCENARIO C Radiation Detection and Radiation Alerts ....................323
SCENARIO D Unattended and/or Suspicious Packages ....................329
SCENARIO E A “Communicated Threat” ...................................333
SCENARIO F An Anthrax Letter ...............................................339
SCENARIO G Industrial HAZMAT Accidents ...............................345
SCENARIO H Suspicious Odors and Unexplained Illness ..................351
SCENARIO I External Chemical Attack .....................................357
SCENARIO J Internal Chemical Attack .....................................363
SCENARIO K The Biological Attack .........................................367
SCENARIO L The Crime Scene ...............................................373
SCENARIO M The “Dirty Bomb” and Structural Collapse .................379

Appendices

APPENDIX A Glossary of Terms, Abbreviations and Acronyms ............385
APPENDIX B Threat Basis and Planning Threshold ........................391
APPENDIX C Template for a CBRN/HAZMAT Site Survey .................395
APPENDIX D Task Lists, Capability Survey, and Capacity Survey ........399
APPENDIX E Synchronization Matrix for CBRN/HAZMAT Response at a Major Event .............403
APPENDIX F  Sample Detection and Identification Decision Trees ........................................ 407

APPENDIX G  If You Only Read One Page, Read This One! .... 411

Bibliography ................................................................. 415

Index ................................................................. 421
This book is about protecting large, high-visibility events and public gatherings from accidents or incidents involving hazardous substances. By this, I mean chemical weapons, biological weapons, radioactive substances, nuclear devices, and the whole spectrum of toxic, flammable, and otherwise dangerous commercial and industrial hazardous materials. Collectively, this is known as the CBRN/HAZMAT threat.

WHO NEEDS TO READ THIS BOOK?

This book as written for anyone involved in the preparation of safety and security plans for large events. It is for two groups of readers. First, the many people who plan, manage, and provide emergency-services support for major events. Few of these people will be subject-matter experts in CBRN/HAZMAT, but they need to know how to correctly consider the CBRN/HAZMAT threat in their plans. The second part of the readership is the CBRN/HAZMAT practitioner who may be tasked to support a major event. Many practitioners have great expertise in response, but supporting a major event can be quite different than normal operations. It will be difficult to address both categories of reader equally and consistently throughout the book. Wherever possible, if I think something is very useful to one or the other group, I will highlight it.

As the reader will soon see, this book cuts across many different disciplines. I try to connect ideas and practices from many different sources, I hope that they are useful to the security, safety, or emergency-planning generalist as well as specialists.

WHY?

I am writing this book because I have spent 12 years working on security and safety arrangements for major public events, both in specific CBRN/HAZMAT roles and in
less specialized antiterrorism roles. I have wanted to write it since January 2005. I was sitting in an assistant fire chief’s car in downtown Washington, D.C., as part of a “joint hazard assessment team” for the second inauguration of President George W. Bush. I was sitting with a command officer from the D.C. Fire Department, an agent from the Washington field office of the Federal Bureau of Investigation, a sergeant from the District of Columbia Metropolitan Police Department, and a military officer from one of the multitude of units supporting the event. I was sitting in the car in the capacity of CBRN specialist from the Secret Service. If we had more room in the car, we could have added at least a dozen others with a valid need to be there.

Because we had to sit in the car the whole day, we talked about many things. However, as we all were CBRN/HAZMAT specialists to one degree or another, we engaged in rather a lot of “shop talk” and airing of grievances, as one does in such a circumstance. I realized that a lot of people cared about doing the right thing, but no one person or department had the whole answer on how to prepare for a large event. This particular day in 2005 was certainly not my first or my last major event. However, certain thoughts started to crystallize in my head. The discussions with my comrades from other agencies and backgrounds reinforced what I already suspected. I realized several important points, which I should describe.

**Major events take a lot of planning and involve a lot of agencies.**

Any major security and safety planning effort will involve many people and many agencies. This means that there will be many different agendas, varying levels of knowledge and experience, and different philosophical approaches. This is a complicated business. Because CBRN/HAZMAT incidents do not happen at every event, sometimes the planning for them is lost in the bureaucratic noise or is not given the emphasis that it should rightly have. More often than not, this is not because of deliberate decisions but because of the bureaucratic nature of the process.

**The wheel gets reinvented every single time.**

The planning and execution of major events are complicated. Major events do not occur every day or even every year in some places. Conditions change. Organizations have personnel turnover and attrition. Even over the course of a six-month planning effort, the individuals who are assigned to attend planning meetings are likely to change. This results in planning efforts that repeat themselves year after year, often without much effort made to capture lessons learned. Some departments and agencies are better than others, but after about ten years, it really did feel that I was starting from scratch each time. It seemed to me that even a minimal effort to capture and write down some “best practices” would help manage the next event.

**The workers and the bosses have different perspectives.**

There are dedicated and knowledgeable people in CBRN/HAZMAT. There are certainly many more people working in the field now than when I started out in the early 1990s. However, if you go far enough up the chain of command, everyone has a boss somewhere who is not a CBRN/HAZMAT specialist and who has a variety of concerns broader than the CBRN/HAZMAT niche. And these are the people likely to be making the big decisions about planning and response at large events. In 20 years in the CBRN/
HAZMAT business, I spent a lot of time working for a boss who was not a specialist in the field, but I also worked in various capacities under bosses who were specialists as well. But once I left the U.S. Army Chemical School, I never once had a second level supervisor, a boss's boss, who was a CBRN specialist. This was certainly the case with just about everyone I worked with. And I suspect that this situation is prevalent around the world.

People from different occupational backgrounds will work on the problem in different ways.

Firefighters, paramedics, police, environmental specialists, public-health specialists, physicians, soldiers, and scientists (to name only a few) will all look at the problem of CBRN/HAZMAT in different ways. This is because their training and experience are different in important ways. All of these perspectives have valid information about how to make the public safe and secure, but none of them has a monopoly on the truth. I have literally seen fights break out between police and firefighters. The efforts involved in CBRN/HAZMAT planning and response for a major event tend to be somewhat outside the parameters of everyone's normal day-to-day roles.

There is no default script to fall back on.

In 2004, Ronald Reagan died. The state funeral for President Reagan required a planning effort that was crushed into a few days rather than the months or years normally allotted for planning for major events in Washington. The Army Military District of Washington had a standing default plan for state funerals. However, we did not have much to work with in the CBRN/HAZMAT arena except for our common sense and experience. If ever there were a day we could have used a "CBRN at Special Events for Dummies" manual, 11 June 2004 was that day. I thought then and continue to believe now that there is a requirement for good planning basics that can be picked up and used in a hurry.

All of these realizations mean that I feel that there is ample scope for a manual that tries to cut through all of these problems and create a useful common body of knowledge.

WHY AM I QUALIFIED TO WRITE THIS BOOK?

First, by definition I am more qualified than anyone else who has written a book on this subject, because nobody else has a book in print on this specific subject. However, that's just a technicality. I have been working for 20 years in the field of CBRN defense and HAZMAT response. My career has taken me on a grand tour through the whole sphere of CBRN/HAZMAT, while also giving me experience in other related sectors such as emergency medicine, military operations, law enforcement, and emergency planning. As we have already discussed, planning for major events sits at the nexus of several different important operational disciplines, and I feel particularly privileged to have worked precisely in that nexus. I was originally trained as a Chemical Corps officer in the United States Army, but my career path forced me to receive training and experience in many other disciplines, including protective security, emergency management, intelligence, radiation safety and health physics, incident command, explosives/demolition, fire safety, hazardous materials, and physical security.
In particular, I had three different assignments in government service that put me squarely in the line of fire for multidisciplinary CBRN/HAZMAT planning and response:

- **Disaster Preparedness Advisor, White House Military Office 1996–2002.**
  I was the CBRN subject-matter expert in the Defense Department office at the White House that handles emergency planning for the President.

  I served in CBRN countermeasures in direct support of the White House and the President in a wide variety of assignments.

- **Operations Officer, 32nd Civil Support Team, Maryland National Guard, 1998–2003.**
  As with most National Guard jobs, this was a part-time position. I worked to establish a state-level emergency-response team for CBRN incidents in Maryland.

Because Washington, D.C., and the White House are central to a disproportionately large portion of major political events in the U.S. and because the Secret Service, by law, is the lead agency in the government for planning and executing security at “National Special Security Events,” I was in a privileged position to take part in many events as a CBRN specialist.

The following list details the various major events in which I had some involvement. In all of these situations, I was involved in at least some CBRN/HAZMAT aspects of the operation:

- Ten State of the Union addresses (1997 to 2006)
- NATO 50th Anniversary Summit, Washington (1999)
- World Trade Organization Summit (1999)
- Y2K Transition (31 December 1999)
- World Bank Summit (2000)
- G8 Summit, Genoa (2000)
- Democratic National Convention (2000)
- IMF Spring Meetings (2003)
- Two UN General Assemblies (2003 and 2004)
- G8 Summit, Scotland (2005)
- Eastern European Summit, Lithuania (2006)

Every one of these events provided some insight and perspective on what to do and what not to do.

One thing that I wish to make clear is that this book is not a platform for me to advocate that the rest of the world should always imitate the United States or the practices of the various agencies where I worked. One of the many things that I learned over
the course of my career is that the American way, even when such a way could be defined at all, has not always been the best. There is good and bad to be found everywhere, and no agency or country has a monopoly on best practices. Some serious mistakes were made during some of the events listed above. I made some of them. I was a witness to many others. In several places in this book I am very critical of the way practices have evolved in the U.S. So, please do not throw down the book thinking that I am yet another man from Washington who thinks that the U.S. government way is the best.

Finally, it is important to say that everything in this book represents my own personal opinion and does not necessarily reflect any policy of any organization that I have worked for in the past. There is no confidential or proprietary information in this book. Any information from other sources is clearly marked by reference notes and/or included in the bibliography.
PART I

Introduction
WHAT IS A MAJOR PUBLIC OR HIGH-VISIBILITY EVENT?

There is no universally accepted definition of what constitutes a “major event” for security and public-safety purposes. Here at an early stage in this book, I want to defuse any potential arguments about terms and definitions. I am going to use the generic term “major event” to denote a wide category of events. While the term “major public event” may resonate with many readers, it can still be confusing. The term “public” could mean either widely publicized or open to members of the public, so we will just call it a “major event” to avoid confusion.

We can have many discussions about whether or not an event is major, high visibility, significant, or a “national special security event” (an American term.). Other terms are in use elsewhere in the world, such as “high visibility event.” I will try to apply a broad definition in this book. By “major event” I mean any large gathering of people that is sufficiently high profile to warrant special planning for security and public safety. The threshold for declaring something to be a major event is tricky and will vary greatly. Political-party conventions, large sporting events, royal weddings, state funerals, large concerts, state visits by important foreign dignitaries, inaugurations of Presidents, and large festivals all certainly count as major events. I do not think that a lengthy discussion of what is or is not a “major event” will be helpful, as local definitions will vary so widely. I think that for the purposes of this book, if a lot of people are in attendance and you are doing security and safety planning in advance, even by a few hours, this book can be helpful. If you are at all worried about CBRN/HAZMAT at an event with a lot of people, whether they are members of the public or dignitaries, then this book can be useful.

Here are some conventions used in this book. I make no apologies for the use of American spelling and writing conventions. While Chapter 1 describes my understanding of a threat in some level of detail, I generally refer to the threat environment and the general subject area covered by this book as CBRN/HAZMAT. CBRN is normally taken to refer to military chemical warfare agents, biological warfare agents, and radiological/nuclear materials. HAZMAT is generally used to refer to hazardous substances used in commerce and industry. In order to avoid arguments, I will often use this collective term CBRN/HAZMAT rather than engage with the argument of where CBRN ends and HAZMAT begins, as I believe that there is no useful answer. I realize that there are many operative definitions of both of these terms in different sectors and in different countries around the world. When in doubt, please assume that I am taking a broad and inclusive interpretation. As you will see as you read this book, I am not making much distinction between the two, as the effects are often identical from a response viewpoint.

I use the term “major event” to mean a high-visibility or major public event. I make a thorough effort to define any acronyms or technical terms, but there is also a glossary at the end of the book. I am trying to avoid excessively technical jargon, because much of it is not universally recognized and many people who are reading this will not be specialists in the field. The reader may notice that I avoid some words and phrases altogether. There are some words and phrases that are used in this field that I find troublesome or confusing, such as the well-worn “weapons of mass destruction.”

Wherever it is necessary, I cite useful documents, articles, and books, and I include them in a bibliography. There are many resources available on the internet. The hyperlinks listed in various chapters or in the endnotes were current at the time of the completion of the book, but web addresses do change over time.
Many of the authorities I cite and much of my experience is based in the United States. However, this is not intended to imply that the United States has supremacy in this field. The problem is global, as is the response.

This book is organized into several broad sections. First, there is introductory material about the overall philosophy and the nature of the threat. The second section consists of broad planning guidance and suggestions for preparing for a major event. The third section talks about specific planning and preparedness measures for specific types of responders, such as medical providers, firefighters, and police. The fourth section is a walk-through of the basic phases of an incident. The last section is a collection of standalone scenarios that are meant to be useful as teaching examples, fodder for training exercises, and general provocation of discussion.

**HOW TO DISSECT CBRN AND HAZMAT**

The size and scope of planning, preparedness, and response at a major event are gigantic. Not only is the responsibility vast; the amount of information that needs to be considered in a reasonable planning and preparedness effort is well beyond the scope of any one person. The task is further complicated by the fact that CBRN/HAZMAT does not exist in a vacuum. Often, in many places, if it exists as a distinct discipline at all, it is buried three or four layers down the pyramid in bureaucracies. By necessity, incorporating CBRN/HAZMAT into security and safety plans and responses will require interagency coordination and interaction between people and agencies in a number of distinct disciplines.

Generally speaking, I wish to approach the subject both chronologically and functionally. We can slice the problem both horizontally and vertically, so to speak. Chronologically, we can step through the four major phases before and after an incident.

**Planning**

Planning is the development of both general and specific plans, procedures, and protocols to prevent, prepare for, respond to, and manage the aftermath of an accident or incident involving CBRN/HAZMAT.

**Preparedness**

Preparedness is the effort to implement a plan and to take measures to prepare for an incident or accident.

**Crisis Management and Response**

The actions taken in the immediate aftermath of an accident or incident to stabilize the situation, save lives, prevent the spread of damage, catch the perpetrators (if any), and any related actions are included in this stage.

**Consequence Management and Recovery**

The actions taken to manage the medium- and long-term consequences of an incident/accident and to return to normal comprise this stage.
We must be realistic and understand that these four phases are not discrete. The categories overlap. There is not any real defined point in time where we stop planning and then only execute the plan. Throughout this book, I use the terms "planning" and "preparedness" loosely, knowing full well that they are hopelessly intertwined. Likewise, efforts to clearly demarcate the transition point between crisis management and consequence management only result in acrimony in planning meetings. Broadly speaking, this book is divided in two parts, a "before" and an "after." We cannot really divorce planning from preparedness, as they overlap. Nor can we really differentiate the response and recovery functions.

In a protracted event, such as a sporting event that goes on for weeks, we may not even be able to adequately divorce "before" from "after," as small events may occur that do not disrupt the entire event or result in the cancellation of the entire major event.

It is possible to discuss the planning and response efforts functionally as well. By this, I mean the various response disciplines:

- Police, law enforcement, and security services, including intelligence functions and private security providers
- Firefighting, rescue, and civil protection
- Military
- Medical
- Scientific and laboratory support
- Others, including environmental, private sector, etc.

It is clear to me that neither a purely chronological approach nor a division strictly into operational disciplines will result in a useful and readable book. I have tried to do both, in effect, and I hope that it works well enough to impart useful knowledge.

There is a lot of material to cover, and it is difficult to summarize in any useful manner. Instead of a formal conclusion, I have made the decision to use scenarios to tie all of the various planning, preparedness, and response material together in a way that might be useful for planning and training. Part V fills this role.
The Threat Environment

The major-event environment faces threats from both deliberate and accidental dispersal of hazardous substances. Safety and security efforts for major events are aimed at preventing acts from occurring, whether they are deliberate or accidental. The response efforts are aimed at combating the adverse effects. To put the situation bluntly, the threat to major events is not the substance or material but the effects caused by its dissemination. For example, the purpose of the major-event security and safety effort is not to prevent or react to employment of chlorine gas. It is to keep people healthy and safe.

I have seen too many CBRN and HAZMAT specialists, myself included, get bogged down in the mechanics in the middle of the situation while losing focus on the end state. Figure 1.1 shows the methodology I prefer to use.

This chapter summarizes the threat environment. Later on in the book, in Part V, I will use specific scenarios to illustrate the major subcategories of threat.

ADVERSE EFFECTS

For both planning and response purposes, it is far more useful to analyze the CBRN/HAZMAT threat environment from the viewpoint of actual effects to people and property. I think that it is far more effective to plan for dealing with large numbers of sick and injured people than it is to conduct planning for specific categories of chemical substance. It is a better use of resources and intellectual capital to have one very good general-purpose plan for sick, injured, and contaminated people than a number of specific plans for specific chemical substances.

I think that planners and responders are better served by considering the end states of CBRN/HAZMAT scenarios and working backwards from them. We can have literally 6000 scenarios and work through them to their conclusion, but this is really a waste of precious time, as there are really only a handful of outcomes. The thousands of available CBRN/HAZMAT substances can cause seven categories of damage.
The adverse effects of CBRN/HAZMAT incidents or accidents include any combination of seven categories of problems, which will be considered individually. Thus, I feel that the “threat spectrum” is better portrayed as a number of conditions to be confronted, not as an A to Z list of toxic or harmful materials. The threat spectrum is composed of the seven adverse effects listed below:

1. Death (immediate or delayed)
2. Injury and illness (immediate or delayed)
3. Psychosocial effects (immediate or delayed)
4. Damage to property
5. Damage to the environment
6. Economic effects
7. Political effects

**Death**

CBRN/HAZMAT materials may cause people to die, either immediately or later on due to injury and illness. The overwhelming operational imperative of major-event planning will obviously be to reduce or eliminate death. It is important to understand that most CBRN/HAZMAT materials do not have much potential to cause instant lethality. While the small number of CBRN terrorist incidents in modern times have caused deaths, they have caused only a handful of immediate fatalities. Even the fastest-acting biological-warfare agents cause death hours or days after exposure. Even the most radioactive “dirty bomb” is likely to cause fatalities only through an explosive dissemination. Many chemical substances, including chemical-warfare agents (CWAs), are theoretically capable of rapidly killing exposed individuals, but field conditions, especially in terrorist or accident settings, rarely allow for the necessary concentrations to be present. Even some of the most deadly CWAs, such as mustard gas or phosgene, will produce only delayed lethality under most circumstances.

**Injury and Illness**

Illness and injury, which may or may not lead to eventual fatalities, are a more significant planning consideration. The vast majority of the CWAs and toxic industrial chemicals are far more effective at causing illness, injury, incapacitation, or serious discomfort than they are at killing people outright. Biological-warfare agents, such as pathogens and toxins, are designed to cause sickness, but not necessarily death. Indeed, rapid death of a host does not serve a useful evolutionary purpose for a disease-producing microbe. Psychosocial effects, discussed below, may lead to panic and disorder, which may result in conventional injuries.
It is very important to understand that many of the CBRN/HAZMAT threat materials do not cause immediate injury or illness. Many materials have latent periods because the mechanism of harm that they use takes time to take effect. In most conceivable radiation-exposure scenarios, radiation sickness and other effects will take a long period of time to develop. In many radiological situations, the long-term delayed effects are statistical in nature and may take years to become apparent. Aside from a handful of fast-acting toxins, biological-warfare agents tend to have delayed effects, as there are incubation periods involved. While many chemicals are fast acting, some are not. Phosgene is a dangerous industrial chemical and chemical-warfare agent, but it takes many hours for its effects to appear.

In the context of emergency planning and response, ill and injured people provide a far greater burden than dead victims. While dead people must be taken care of, the urgency is far less than with living victims who need rescue, decontamination, immediate first aid, and/or transport to definitive medical care.

**Psychosocial Effects**

CBRN/HAZMAT materials may cause many psychological and social effects. The psychological and emotional effects of CBRN warfare and terrorism have generally been less studied than the physical effects. For the most part, CBRN weapons are invisible. For many people, a threat that you cannot see produces far more fear and anxiety than a well-known or highly visible danger. Fear can be effectively contagious. In addition, there is the possibility of psychogenic effects, where fear and anxiety may produce physical symptoms not unlike exposure to some of the threat materials. In other circumstances, people with existing mundane illnesses may mistake their symptoms for exposure. People with nausea may mistake it for acute radiation sickness and people with respiratory infections will think that they have anthrax. The term “worried well” is often used, and this phenomenon will be discussed in more detail in the section on medical preparedness.

**Damage to Property**

In many situations and scenarios, property may be contaminated and rendered unusable for its intended purpose. Sometimes actual contamination is not necessary for people to imagine that it might be present. If people think that an area or a building still poses a threat, they will not go there, causing businesses to suffer. The psychological taint may prove harder to remove than any physical taint. Because many major events occur in sites of unique cultural importance, the damage to property may assume more dimensions than merely economic.

**Damage to the Environment**

The vast majority of CBRN/HAZMAT materials would qualify as environmental contaminants in most regulatory regimes. The long-term environmental effects of dispersal of such materials could cause problems for decades. As with damage to property, some threats such as anthrax or radiation may induce such fear that people will assume that they are present long after they have decayed or been decontaminated.
Economic Damage

Both CBRN terrorism and HAZMAT accidents can be responsible for vast economic damage. Response to disasters costs money. The economic impact of conventional terrorism is well documented,\(^2\) and the existence of materials that contaminate property will only serve to extend the economic impact of terrorist attacks. It is my opinion that indirect costs of CBRN/HAZMAT incidents will greatly exceed the direct costs. The loss of property and/or the extensive efforts to restore property to usable condition could be very expensive. Recovery efforts, including decontamination, could take a very long period of time and many resources. Businesses could lose revenue or close. Buildings and areas of cities may be isolated or abandoned for periods of time, having adverse effects on the economy. Indirect effects are possible too, as financial markets will react to terrorist events and major accidents.

Political Damage

CBRN/HAZMAT incidents can be damaging to the prestige and authority of civil leaders. We need only to look at the Fukushima nuclear disaster to understand that situations involving CBRN/HAZMAT can have wider-ranging political implications. At a fundamental level, the purpose of nation-states is to protect their citizens. The delay or cancellation of a major event due to a CBRN/HAZMAT incident may have political repercussions. Both deliberate and accidental releases of CBRN/HAZMAT substances mean that the state has failed in its duty to protect the public.

CAUSATIVE AGENTS: THE SPECTRUM OF CBRN/HAZMAT SUBSTANCES

We can approach the subject of the threat to major events in a number of different ways. I think that it would be counterproductive to attempt a vast catalog of possible materials that can cause death, illness, or injury by design or accident. It is not the author's intent to give a catalog of death and destruction, and such an attempt would fill a hundred redundant pages. There are many excellent reference works that can serve as the A-Z of CBRN and HAZMAT threats, and it will serve little purpose for me to try to retread the work of others. U.S. Army Field Manual 3-9,\(^3\) available widely on the internet as a PDF, is a classic reference, as are Jan Medema's Basic Principles of Chemical Defense\(^4\) and the various works of Frederick Sidell, particularly Chemical Warfare Agents: Toxicology and Treatment.\(^5\) Rather than repeat the work done by many others, I will try to cut through to the information that is relevant to protecting major events. We should try to find a way to look at the threat that helps us decide where to prioritize our efforts.

We've already established that adverse effects are the threat. But we can examine the causes of the adverse effects. These are the causative agents. We can look at the "what"—the physical material that causes the threat—the "how"—the mechanism by which it is dispensed—and the "who" and "why"—who did it and for what purpose. Let us first examine the "what."