



High-Rise Security and Fire Life Safety

Office Buildings

Hotel Buildings

Residential and Apartment
Buildings

Mixed-Use Buildings



High-Rise Security and Fire Life Safety

Third Edition

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ASIS International

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Building Security Council

Certified in High-Rise Life Safety Services
Los Angeles Fire Department



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Dedication

To those people who lost their lives due to the September 11, 2001, New York World Trade Center terrorist attack:[±]

Douglas G. Karpiloff, CPP, Port Authority of New York and New Jersey, security and life safety director for the New York World Trade Center, who at the time was transitioning his responsibilities to John P. O'Neill, Silverstein Properties, who was in his second day as head of the New York World Trade Center's security operation; James Corrigan, security and life safety director for 7 World Trade Center, Silverstein Properties; Robert H. Lynch, Jr., manager 5 World Trade Center, Port Authority of New York and New Jersey; Charles Magee, chief engineer, Silverstein Properties; John M. Griffin, director of operations, Silverstein Properties; Howard B. Kirschbaum, security manager for Marsh U.S.A. Inc.; Ronald G. Hoerner, resident manager of Summit Security Services, Inc.'s, World Trade Center contract security operation; Richard Rescorla, CPP, first vice president of security for Morgan Stanley Dean Witter; Larry Bowman, Denny Conley, Francisco Cruz, Samuel Fields, Daniel Lugo, Robert Martinez, Jorge Morron, Esmerlin Salcedo, and Ervin Gaillard, security officers for Summit Security Services; Andrew Bailey, Mannie Clark, Lamar Hulse, and Stanley McCaskill, security officers for Advantage Security; and Francisco E. Bourdier, security officer for Allied Security, who was killed at a nearby building when one of the towers collapsed.

A total of 343 New York City firefighters, 37 Port Authority police officers (including Robert D. Cirri, police lieutenant; Anthony P. Infante, Jr., police inspector; Robert M. Kaulfers, police sergeant; Kathy Mazza, police captain; Ferdinand V. Morrone, director of public safety/superintendent of police; and James A. Romiot, police chief), an additional 35 Port Authority of New York and New Jersey civilians, and 23 New York City police officers.

And my wife, Sarah, my sweetheart and beloved helpmate, and Pip and Searcy, our treasured children, who put up with me working nights, weekends, and holidays.

And, the Lord, who sustains me every day. It is doubtful whether this book could have been written without the guiding hand of God.

[±]The names of those persons, except for Francisco E. Bourdier, who perished on September 11, 2001, at the New York World Trade Center were obtained from *ASISDynamics* (ASIS International, Alexandria, VA, November/December 2001) and *BOMA.org Staff* (BOMA International, Washington, DC, May 2002).



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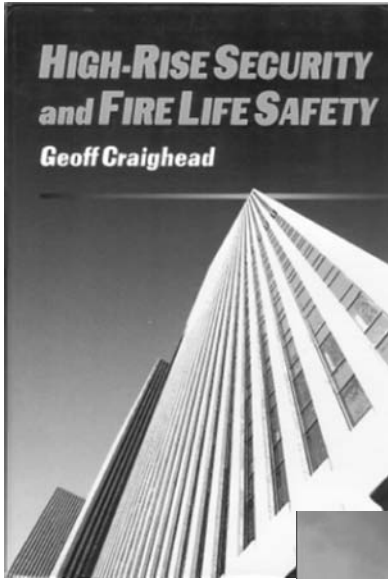


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**High-Rise Security
and FIRE LIFE SAFETY**
Geoff Craighead

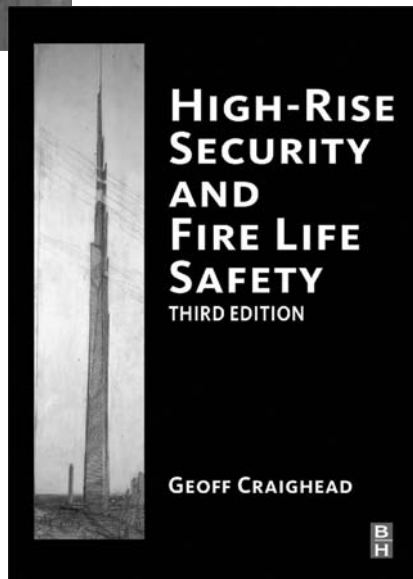


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THIRD EDITION

GEOFF CRAIGHEAD

BH



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*Darkness on the hallways. Voices echo. Silence
holds... Watchmen walk slow from floor to floor
and try the doors. Revolvers bulge from their hip
pockets... Steel safes stand in corners. Money
is stacked in them.*

*A young watchman leans at a window and sees the lights
of barges butting their way across a harbor, nets of
red and white lanterns in a railroad yard, and a span
of glooms splashed with lines of white and blurs of
crosses and clusters over the sleeping city.*

*By night the skyscraper looms in the smoke and the stars
and has a soul.*

—*Skyscraper* by Carl Sandburg

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Preface

Due to their design and construction, high-rise buildings are unique structures with specialized needs. To protect the lives and property of the multitudes of people who daily use these facilities, it is essential that high-rise security and fire life safety programs be well planned and executed. Useful reference materials for commercial real estate owners and managers; security and life safety directors; security integrators and consultants; contract security companies; building and fire protection engineers; architects and builders; building, fire department, and law enforcement officials; and insurance firms include the following:

- High-rise building definition, development, and use
- Security and fire safety uniqueness of high-rise buildings
- Security and fire life safety threats
- How to conduct risk assessments
- Security and fire life safety systems and equipment in high-rise buildings
- How to effectively manage the security function, including investigations
- Security and emergency planning of office buildings, hotels, residential and apartment buildings, and mixed-use buildings
- Liaison with law enforcement and fire authorities
- Laws, codes, standards, and guidelines that govern security and fire life safety

The third edition of *High-Rise Security and Fire Life Safety* addresses these areas. In contrast to the previous two editions, which primarily focused on office buildings, this edition has been expanded to include hotel buildings, residential and apartment buildings, and mixed-use buildings.

Since this book was first published, there has been considerable change in the risk management of buildings. The disastrous events of September 11, 2001, when the Twin Towers of the New York World Trade Center were destroyed in a terrorist attack, were a watershed in the world of high-rise security and fire life safety. The attack on 9/11 has transformed the way we live and work in many facilities throughout the world. For obvious reasons, this event is given special treatment.

This book supplies material that can be adapted, modified, rejected, or used for the reader's own purposes. I have endeavored to avoid errors, both of omission and commission. I will be glad to correct in future editions any inaccuracies that are brought to my attention.

It should be noted that, despite my professional affiliations and employment by a private security company, the observations expressed in this book are mine and do not necessarily reflect the viewpoints of those organizations.

In conclusion, I entrust this book to the kind consideration of building owners and managers in general, and security and fire life safety professionals in particular, with the desire that it will continue to benefit the high-rise community. Only when knowledge is applied specifically to the needs of a particular facility will it become of real value. Therein lies the reader's part.

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Foreword to the Third Edition

Since the mid-1990s, we have seen a tall building boom unprecedented in the history of humankind. Whereas since the late 1800s we have witnessed specific “regionalized” periods of intense tall building construction—such as during late nineteenth century Chicago or art deco New York—this is the first time in history that we have seen tall buildings realized in unprecedented numbers on virtually all continents of the globe simultaneously. This is resulting in ever-denser, ever-taller cities from Moscow to the Middle East, from Shanghai to San Francisco. Some of the statistics are incredible; there are now more tall buildings in Asia than there are in North America—the traditional home of the skyscraper—and, by 2010, 59 of the 100 tallest buildings in the world will have been completed in the previous four years, since 2006. Not only is Burj Dubai in the United Arab Emirates set to smash all “tallest” records, with a height expected to be in excess of 800 meters/2600 feet (60% greater than the world’s current tallest building, Taipei 101 in Taiwan), but one in three of the world’s 100 tallest buildings is expected to be located in the Middle East region by 2010.

It is not only the height and geographic spread of tall buildings that has changed. Whereas the history of the world’s tallest buildings has been dominated by office buildings, many of the world’s new supertalls now contain residential or mixed-use functions. Similarly, whereas most tall buildings in the past were constructed of steel, we are now seeing a more significant use of concrete and composite (steel + concrete) construction. Additionally, whereas through the late 1980s or so, many of these buildings were built to project the prowess of an individual corporation, now they have taken on a new agenda: tall buildings are increasingly being built to project the vitality of a city on a global scale—creating skylines with brand recognition on an international level. This shift from corporate to city (or even government) ambition is reflected in the very titles of the world’s tallest buildings; formerly we had icons such as Chrysler, Sears (Willis), or Petronas; now we have Taipei 101, Burj Dubai, or the Chicago Spire, where the building itself takes on the responsibility of helping promote the city on the world stage.

This unassailed march of the tall building, after a decade or two of unbridled growth, is, of course, now under threat from the growing economic crisis gripping the globe. The question on everybody’s lips is, how bad is it going to get? Already we are seeing many high-profile proposals, some already under construction, slow down or stop completely. Perhaps this is not entirely a bad thing: perhaps it will give us, as an international community, a pause for reflection—on the cities we are creating and the merits or otherwise of some of the architectural excesses that have resulted as part of this unprecedented boom. Surely there is a need for reflection, especially with regard to the challenges of climate change and the need for more sustainable cities, buildings, and patterns of life in the future.

So the third edition of this seminal book comes at a pivotal time in the history of the tall building, not only in terms of whether these buildings will continue to grow in both size and number, but also whether they will evolve into the advanced entities they need to become to face the challenges of our time. Safety and security constitute an essential part of this equation. The decreasing political, ethnic, religious, resource, economic, and military stability of the world seems to have reached a new low, to the point where we now live in a world more unstable and dangerous than at any time since the late 1970s. The impact of terrorism and intentional acts of malice toward innocent people has massive implications for the design and construction of cities, buildings, and tall buildings specifically. It seems that nowhere is untouched—from New York to New Delhi, London to Lahore, Mumbai to Madrid. The increased “iconic-ness” of tall buildings gives them an increasing vulnerability to those who seek to get maximum publicity for their atrocious acts, as we have already seen to disastrous effect.

In the years since 9/11 and the World Trade Center tower collapses, we can certainly conclude that the event did not have the detrimental impact on the tall building typology as a continuing vital element in our urban centers that many feared. In fact, the exact opposite may indeed be true—the scale of the 9/11 event and the publicity given to the skyscraper may have contributed to its keen boost around the world since then. What the event did do, however, is initiate perhaps the largest introspective analysis of tall buildings ever, and this book is at the forefront of much of the state-of-the-art thought that resulted from that event, and the research conducted since then, in security and life-safety terms.

There is no doubt that the events of 9/11 are resulting in better designed, safer buildings throughout the world, but we need to ask ourselves if it is enough, in the unstable world we now inhabit. The twin challenges of terrorist-impacted security and a climate-changed urbanity put the tall building in a big spotlight. How can it evolve to meet these challenges? One thing is for sure—it seems unlikely that events such as 9/11 or Hurricane Katrina are going to abate any time soon.

This book is thus a departure point for this inquiry, posing the difficult questions that need to be asked and some of the possible solutions that building owners and managers, developers, architects, engineers and occupants will increasingly have to face in the coming years. Geoff Craighead brings into sharp focus many of the issues connected with this most complex of building types, and I fully recommend his book to you.

Antony Wood
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Foreword to the Second Edition

In the world of high-rise building design and construction, a variety of security and life safety questions are posed to the engineers and architects who must provide a functional building. The solutions should balance the design with the risks associated with any building—regardless of size and occupancy.

These are among the issues discussed throughout the second edition of *High-Rise Security and Fire Life Safety*. Most of these subjects apply to the entire range of high-rise building stock in the world—both new and existing. While we have always known that the life safety protection of the occupants of buildings is of paramount importance, today's building tenants demand more: How secure is their space from a variety of threats, including theft of both real and intellectual property? Are tenant companies and their employees protected against personal harm by intruders, accidental fire and, now, terrorist attacks?

Achieving the proper level of protection is not possible with just one system or one procedure. It is the synergistic effect of all building systems and features working together that keeps facilities safe. Throughout the history of high-rise buildings, the norms for building safety have been derived from, and applied to, a great number of designs. World Trade Center 1 and 2 in New York; Petronas Tower 1 and 2 in Kuala Lumpur; Jin-Mao Building in Shanghai; Sears Tower in Chicago; and Emirates Tower in Dubai: all of these magnificent buildings have incorporated numerous systems and features that work, and have worked, to keep them safe during a wide range of events.

As building systems become more intricate and sophisticated, the overlap between systems is more pronounced now than ever before. The delineation between building security systems and fire alarm systems is just one example. Understanding the role, limitations, and interface between systems is fundamental to system selection. Complementing the systems side of building design is the operating feature, or human interface, that supplements these sophisticated systems. The best written plans and the highest quality building systems and components are meaningless if they are not exercised, tested, reviewed, checked, and updated on a periodic basis.

Geoff Craighead has provided us with a thorough description and review of all of these subjects as they relate to high-rise buildings. The public is now acutely aware of the importance of its own safety in high-rise buildings, and wants to know how building management teams are protecting them. As in the first edition of this book, we are given the road map of how to implement the best plan for a particular building.

The latest peril affecting design, namely the new level of hostile acts, is introduced in this edition of the text. Terrorist acts present unique threats that require new countermeasures.

High-rise buildings are not inherently dangerous structures, but they do require additional systems and features that other buildings do not. Keeping them safe and functional is what this text is all about.

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Foreword to the First Edition

Vertical cities—or high-rise buildings, as they are called—pose unique problems for security and safety professionals charged with the responsibility of protecting life and property. High-rise buildings, such as the Sears Tower in Chicago, the World Trade Center in New York, and thousands of others across the United States, are virtually cities within themselves. Just as the architecture within each varies, so do the regulations governing security and fire life safety programs for each building.

Every year, we see, hear, and read about the terrible tragedies caused by fires, earthquakes, tornadoes, bombings, disgruntled employees, terrorists, and the like. Every possible scenario must be accounted for. There is no substitute for an effective security and fire life safety program. Thousands of lives are dependent on it. Awareness and training are essential. Security and safety personnel must be trained for any and all eventualities.

The author includes here the terminology, the functions, the procedures, the equipment, and the standards for an effective program. *High-Rise Security and Fire Life Safety* is a comprehensive resource for everyone who manages, works in, or visits high-rise commercial office buildings.

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