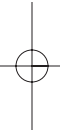
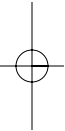
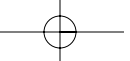


FIRE PREVENTION

INSPECTION AND CODE ENFORCEMENT







FIRE PREVENTION INSPECTION AND CODE ENFORCEMENT

Third Edition

David Diamantes

THOMSON

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Fire Prevention: Inspection and Code Enforcement, 3rd Edition

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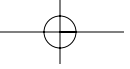
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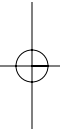
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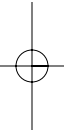
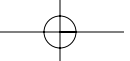
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To my wife, Bonita, without
whose support and encouragement
this work would not have been possible.





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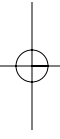
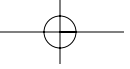
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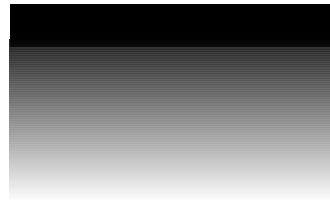
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P R E F A C E

WHY FIRE PREVENTION?

On February 20, 2003, foam plastic soundproofing material was ignited by an indoor pyrotechnic display at the Station nightclub in West Warwick, Rhode Island. The fire claimed one hundred lives and resulted in two hundred injuries. The press had a heyday. The public was outraged. Elected officials questioned the safety of public assemblies within their jurisdictions. Fire officials scrambled to provide answers to all the questions while checking to make sure that nightclubs in their own jurisdictions were safe. Unfortunately, it takes a catastrophe to remind the public that the danger from fire is real and that fire affects real people, not just names in the newspaper. But the loss of life isn't the only tragedy caused by fires.

The incidence of fire in the United States says a lot about us as a people. Study after study has identified the loss from fire in our country as a national disgrace, yet the American people, the media, and all levels of government are unaware of or unable to recognize that a problem even exists. Many in the fire service are loath to dedicate staff and resources to the very effort that led to the development of the municipal fire service in this country—fire prevention. Many in fire service management view fire prevention as a political liability. Some have even gladly relegated the function to another agency or, worse, abandoned the effort in favor of other functions. The image of a fire inspector armed with a code book and a clipboard rarely makes the news unless it involves a politically sensitive issue.

The roots of today's fire service are anchored in the ashes of the great conflagrations of the late nineteenth and early twentieth centuries when fire brigades and salvage companies were commissioned by the stock fire insurance companies for the protection of insured properties. Perhaps we have forgotten where we came from. The protection of life and the preservation of property through education, regulation, and enforcement were and still are the jobs of the fire service. The very existence of many communities revolves around a few select industries. Most of the citizenry is employed within those industries, by their suppliers, or within the service sector that provides housing and basic goods and services.

When fire destroyed Farmland Foods' processing center in Albert Lea, Minnesota, on July 9, 2001, seven hundred of Albert Lea's citizens were thrown out of work at the city's second largest employer.¹ The unemployment rate literally doubled overnight. The effect on the region's economy will be severe at best—devastating at worst. Mortgage and car loans will default; stores and restaurants will suffer a decline in business as belts are tightened. The economic trickle-down impacting the lives of literally thousands of people can be traced back to sparks from a welder's torch that ignited combustible materials. One of the most common and easily prevented causes of industrial fires has again changed the future of an entire region.

If a method to prevent earthquakes, tornadoes, or hurricanes were discovered, the public would demand swift implementation. Government and industry would devote millions of dollars and dedicate the best and the brightest to the project. Compare the pipe dream of controlling the weather with the reality of America's fire record, and the results are sobering:

The fire problem in the United States, on a per capita basis, is one of the worst in the industrial world. Thousands of Americans die each year in fires, tens of thousands of people are injured, and property losses reach billions of dollars. To put this in context, the annual losses from floods, hurricanes, tornadoes, earthquakes, and other natural disasters combined in the United States average just a fraction of the losses from fires. The public in general, the media, and local governments, however, are generally unaware of the magnitude and seriousness of fire to the communities and to the country.²

Fire in the United States, Eleventh Edition, August 1999

The frequency and severity of fires in America do not result from a lack of knowledge of the causes, means of prevention or methods of suppression. We have a fire "problem" because our nation has failed to adequately apply and fund known loss reduction strategies.³

Recommissioned Panel for America Burning, May 2000

America today has the highest fire losses in terms of both frequency and total losses of any modern technological society. Losses from fire at the high rate experienced in America are avoidable and should be as unacceptable as losses caused by drunk driving or deaths of children accidentally killed playing with guns.⁴

Recommissioned Panel for America Burning, May 2000

Too frequently an exhaustive report on (fire safety) conditions is treated by the municipal authorities with an indifference akin to contempt.⁵

*National Association of Credit Men, Committee on
Fire Insurance, June 1909*

When I began my career as a firefighter, it never occurred to me that fires were not only a threat to my community, but a threat to my livelihood as well. I reasoned that the higher the fire frequency and the greater the damage, the more the public would realize just how vital my services were to the community. I could not have been more wrong. Every fire affects every member of the community through increased costs for government services, loss of jobs and productivity, increased insurance premiums, and erosion of the tax base. The municipal budget that funds the fire department is the same one that funds every other local government service and is entirely dependent on the local tax base. When forced to choose between government services, the public chooses education first. Who can resist the mantra

“It’s for the children”? Parks, libraries, public safety, and other services vie for whatever is left. Fire is always something that happens to other people. When forced to choose between a service that they feel directly affects them and those that only affect other people, which will the public choose?

The process of inspection and the enforcement of the fire prevention codes is one part (albeit an important one) in the fight against one of our nation’s most significant problems. You have the means to play a part in an endeavor with a greater potential economic impact than controlling the weather. If you do not believe in preventing fires for the good of your community, believe in it for your own job security.

HOW TO USE THIS BOOK

Throughout this text, the model codes and referenced standards are described as the tools of the trade for the fire inspector. Learning to be an inspector is, in fact, mostly a lesson in how to use these tools. Using this book without access to a model building and fire code is a bit like studying a how-to manual on fly-fishing without having a fly rod. The greatest challenge in writing the original text and in updating this second edition was attempting to describe the basic principles of the fire inspection process within the different code systems in use today. Much of the first chapter, on code administration, is devoted to describing the different approaches taken by local, state, and federal government in adopting building and fire prevention regulations.

There are now two model code systems in use within the United States. The “big three” regional model code organizations, Building Officials and Code Administrators International (BOCA), International Conference of Building Officials (ICBO), and Southern Building Code Congress International (SBCCI), abandoned their respective model codes and cooperatively developed the *International Codes* in 2000. They got along so well that the three groups consolidated in 2003 and exist today as the International Code Council. The International Building Code has been adopted by forty-five states, Washington, DC, and the Department of Defense. The International Fire Code has been adopted by thirty-six states and Washington, DC.

The National Fire Protection Association (NFPA) publishes NFPA 5000, *Building Construction and Safety Code* and NFPA 1, *Uniform Fire Code*, in addition to almost three hundred other codes standards and recommended practices. NFPA 5000 has not been widely adopted. The Uniform Fire Code (formerly printed by ICBO for the Western Fire Chiefs Association) is used by several states and numerous jurisdictions.

As an inspector, you probably will not have a large say in the code system adopted within your jurisdiction anymore than you get to pick the mayor or city council. You will work with the tools they give you and attempt to provide the best service to the public and the business community you can. In the aftermath of a fire at the Imperial Foods processing plant in Hamlet, North Carolina, in 1991, in which twenty-five were killed and fifty-four injured, the local fire chief stated that the entire incident centered around one problem—lack of enforcement of existing codes.⁶ *What* code is not as important as consistent, competent, and evenhanded inspection and enforcement.

FEATURES OF THIS BOOK

There are many features contained within the chapters of this book, which will assist you in learning the valuable concepts associated with fire prevention.

- **Safety** is emphasized throughout the book, including a chapter on general fire safety provisions (9), to ensure that the proper precautions are utilized to help prevent fire and loss of life.
- **Key terms** and **notes** highlighted in the margins of each chapter reinforce the critical knowledge required for effective performance on the job.
- **Review questions** provide an important review of the content in each chapter, while **Discussion questions** present scenarios to strengthen effective identification of hazards and efficient problem-solving skills.
- **FESHE correlation** to the *National Fire Academy* course on fire prevention illustrates how and where the content in the book meets the desired outcomes for this course, in order to promote standardized training.
- Comprehensive **appendices** in the back of the book include important mathematical references, a copy of the 2004 National Fire Codes Contents, and a **Glossary** to provide an informational guide that is handy for use in the classroom or on the job.

NEW TO THIS EDITION

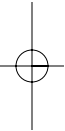
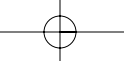
- **International Building Code (IBC) 2006** references, including code tables, provide an up-to-date explanation of the rules and regulations behind building code safety.
- **Organization** and **effective use** of the **IBC** is covered to ensure a clear understanding of these important standards.
- New section on **Materials in relation to fire spread** is included in order to keep up to date with the latest considerations in fire prevention.
- **New inspection requirements** based on the advancement of technology are covered in order to keep pace with the industry.
- A report on **recent fire events** reinforces the necessity of fire prevention and how these events influence changes in the international code-making process.

SUPPLEMENT TO THIS BOOK

An e-resource CD-ROM is available for instructors, and includes many handy tools for effective classroom presentation and student evaluation.

- An **Instructor's Guide** includes lesson plans with PPT correlations, as well as answers to review and discussion questions.

- A **PowerPoint® Presentation** for each chapter highlights the critical points and enhances classroom lectures.
- A **testbank** with approximately 400 questions provides instructors with an option for student evaluation of chapter content. Each chapter testbank provides questions that may be edited, deleted, or supplemented by instructor questions. Instructors may also have the options of creating their own tests by electronically sorting questions.
- A correlation to **NFPA Standard 1031** and the **FESHE** course on *Fire Prevention* provides the required references for instructor preparation of course content.





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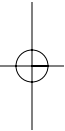
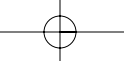
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FIRE AND EMERGENCY SERVICES HIGHER EDUCATION (FESHE)

In June 2001, The U.S. Fire Administration hosted the third annual *Fire and Emergency Services Higher Education Conference*, at the National Fire Academy campus, in Emmitsburg, Maryland. Attendees from state and local fire service training agencies, as well as colleges and universities with fire related degree programs attended the conference and participated in work groups. Among the significant outcomes of the working groups was the development of standard titles, outcomes, and descriptions for six, core associate-level courses, for the *model fire science* curriculum that had been developed by the group the previous year. The six core courses are *Fundamentals of Fire Protection*, *Fire Protection Systems*, *Fire Behavior and Combustion*, *Fire Protection Hydraulics and Water Supply*, *Building Construction for Fire Protection*, and *Fire Prevention*.¹

FIRE PREVENTION COURSE CONTENT

The National Fire Science Curriculum Advisory Committee identified nine desired outcomes, involving twelve content areas for the course.² This text was written to address each desired outcome within the twelve content areas.

Fire Prevention Core Course—Desired Outcomes

1. Define the national fire problem and main issues relating thereto.
2. Recognize the need, responsibilities, and importance of fire prevention as part of an overall mix of fire protection.
3. Recognize the need, responsibilities, and importance of fire prevention organizations.
4. Review minimum professional qualifications at the state and national level for Fire Inspector, Fire Investigator, and Public Educator.
5. Define the elements of a plan review program.
6. Identify the laws, rules, codes, and other regulations relevant to fire protection of the authority (ies) having jurisdiction.
7. Discuss training programs for fire prevention.
8. Design media programs.
9. Discuss the major programs for public education.

FESHE Content Area Comparison

The following table provides a comparison of the twelve FESHE content areas with this text.

FIRE AND EMERGENCY SERVICES HIGHER EDUCATION (FESHE) COURSE CORRELATION GRID		
Name:	<i>Fire Prevention</i>	<i>Fire Prevention, 3rd Edition Chapter Reference</i>
Course Description:	This course provides fundamental information regarding the history and philosophy of fire prevention, organization and operation of a fire prevention bureau, use of fire codes, identification and correction of fire hazards, and the relationships of fire prevention with built-in fire protection systems, fire investigation, and fire and life-safety education.	
Prerequisite:	None.	
Course Outline:	<ul style="list-style-type: none"> I. History and Development of Fire Prevention <ul style="list-style-type: none"> A. Fire Prevention Organizations Public, Federal, State, & Private II. Organization of a Fire Prevention Bureau <ul style="list-style-type: none"> A. Functions B. Fire Prevention Duties and Responsibilities C. Fire Prevention Tools of the Trade III. Building Codes and Fire Prevention <ul style="list-style-type: none"> A. Model Building Codes B. Other Codes IV. Fire Codes and Fire Prevention V. Structural Elements VI. Inspection Procedures VII. Identification of Hazards <ul style="list-style-type: none"> A. Common vs. Special Hazards B. Hazard Types C. Non-structural Hazards D. Deficiencies in Fire Protection Equipment and Systems VIII. Abatement and Mitigation of Hazards IX. Fire Investigation X. Public Fire Safety Education XI. Plan Review XII. Report Preparation and Record Keeping 	<ul style="list-style-type: none"> 1, 2 1, 2 1, 2, 3 1, 2, 3, 5, 10, 11, 19 3, 4, 5, 6, 7, 8 6, 7, 8, 9 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 4, 5 1, 2 2, 3, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 3, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 9, 12, 13, 14, 17, 18 6, 8 1, 2 3, 4, 5, 6, 7, 8 1