

# A Fire Code Primer

Russ Boesch, CPEA, CHMM  
Senior Program Director

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# “License to Operate”

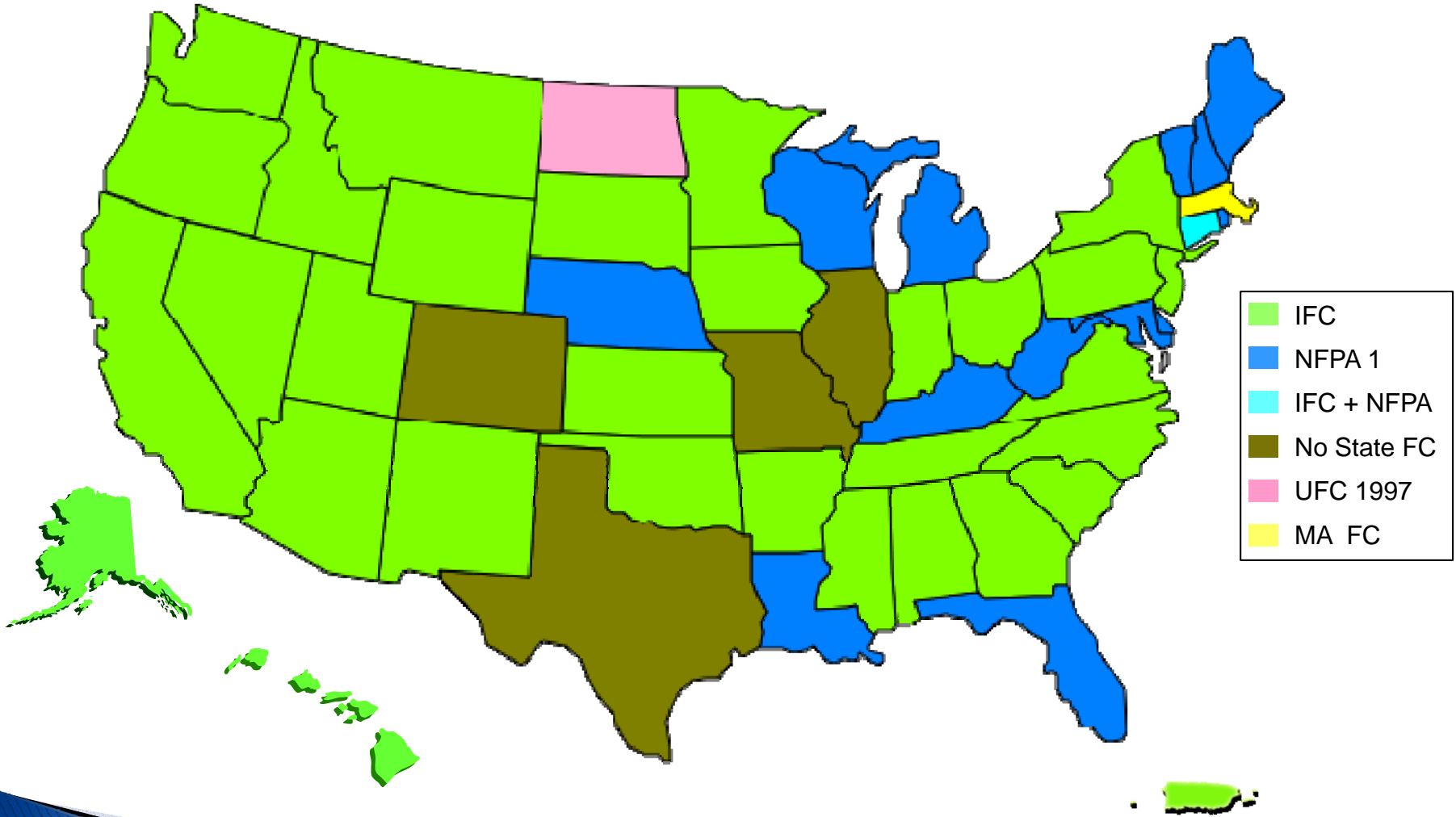
- ▶ Compliance with environmental regulations
- ▶ Compliance with safety and health regulations
- ▶ What about Fire Code standards?
  - General standards
  - Specific activities
  - Permit requirements

# What is the “Fire Code”?



- ▶ Two primary international standards:
  - International Fire Code (IFC)
  - National Fire Protection Association Fire Code (NFPA 1)
- ▶ Updated triennially, so there are several versions of each (2003, 2006, 2009, 2012)

# State Adoption

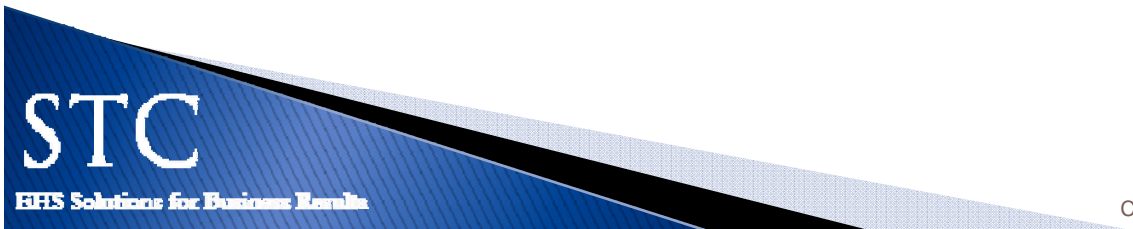


# State Adoptions of IFC (as of February 2013)

2003	2006	2009	2012
Arizona	Arkansas	Alabama	Wyoming
Connecticut	D.C.	Alaska	
New Mexico	Georgia	California	
	Indiana	Idaho	
	Kansas	Iowa	
	Minnesota	Montana	
	Mississippi	North Carolina	
	Nevada	Ohio	
	New Jersey	Oregon	
	New York	Pennsylvania	
	Oklahoma	South Carolina	
	Tennessee	South Dakota	
		Utah	
		Virginia	
		Washington	
		Puerto Rico	

## State Adoptions of NFPA 1 (as of February 2013)

2003	2006	2009	2012
Connecticut	Hawaii	Delaware	Vermont
Nebraska	Kentucky	Florida	
Rhode Island	Maine	Louisiana	
	Michigan	Maryland	
		New Hampshire	
		West Virginia	
		Wisconsin	



# Modifications to Fire Code

- ▶ States can modify the Fire Code
- ▶ So check for amendments
- ▶ Also check your local ordinances
  - State of Tennessee adopted IFC 2006
  - City of Memphis adopted IFC 2003 with amendments

# Promulgation of Fire Code Standards

- ▶ Consensus standards
- ▶ Approved by ANSI
- ▶ Triennial update cycle
- ▶ State adoptions lag behind





# NFPA 1 as surrogate for “Fire Code”

- ▶ Fire Code extracts or incorporates hundreds of other standards and codes



# Goals of the Fire Code

## ▶ Safety

- Fire safety
- Safe building use
- Hazardous materials

## ▶ Property protection

- Limit damage from incidents

## ▶ Public welfare

- Continued function of buildings such as schools, hospitals, day care centers, government offices, etc.

# Enforcement of Standards

- ▶ IFC and NFPA do not enforce compliance with their respective standards
- ▶ Enforcement is the responsibility of the “Authority Having Jurisdiction” (AHJ)



# Authority Having Jurisdiction

- ▶ The AHJ could be...
  - Your local Fire Chief
  - Your local code enforcement official
  - State Fire Marshal
  - Your property insurer

# AHJ Powers and Duties

- ▶ Issues permits
  - ~80 categories of “Operations and Materials” that require a permit
- ▶ Issues certificates of fitness

# Pause for... Questions?



# Activities Requiring Permit – Examples

- ▶ Airport terminal buildings
- ▶ Automatic fire suppression systems
- ▶ Cleanrooms
- ▶ Combustible materials storage\*
- ▶ Compressed gases\*
- ▶ Dust-producing operations\*
- ▶ Flammable and combustible liquids\*
- ▶ Hazardous materials\*
- ▶ Industrial ovens and furnaces\*
- ▶ Laboratories
- ▶ Organic coatings manufacturing
- ▶ Refrigeration equipment\*
- ▶ Stationary lead-acid battery systems\*
  
- ▶ Municipal permits may be required





# Permit Threshold Examples

## ▶ Compressed Gases

- Corrosive or flammable 200 cubic ft
- Inert and simple asphyxiant 6000 cubic ft
- Pyrophoric or toxic Any amount

## ▶ Hazardous Materials

- Corrosive liquids 55 gal
- Toxic liquids 10 gal
- Toxic solids 100 lb
- Pyrophoric liquids or solids Any amount



# AHJ Powers and Duties

“Nothing... shall diminish the authority of the AHJ to determine compliance with codes or standards for those activities or installations within the AHJ’s responsibility.”  
[NFPA 1, Sec. 1.3.2.3]

# AHJ Powers and Duties

- ▶ “The specific requirements of this Code shall be permitted to be altered by the AHJ to allow alternative methods that will secure equivalent fire safety...” [Sec. 1.4.2]
- ▶ “The AHJ is authorized to render interpretations of this Code and to make and enforce rules and supplemental regulations in order to carry out the application and intent of its provisions.” [Sec. 1.7.3.1]

# Twelve Occupancy Classifications



Fire Code requirements vary by occupancy classification



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# Fundamental Requirements

- ▶ Multiple safeguards
- ▶ Unobstructed egress
- ▶ Conspicuous marking and illumination of egress
- ▶ Occupant notification (e.g., fire alarm system)
- ▶ Building protection systems



# Summary of Select Standards

- ▶ IFC comprises 47 chapters and 10 appendices or about 550 pages
- ▶ NFPA 1 comprises about 65 chapters and 7 appendices and 600 pages, so...
- ▶ We'll summarize just a few standards from NFPA 1

# Overlap with OSHA

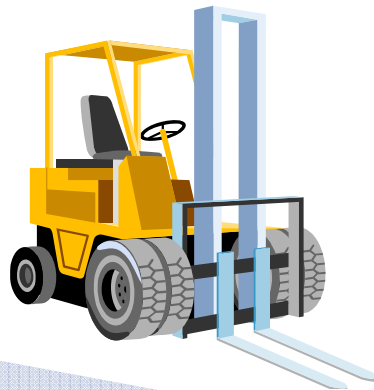
- ▶ Some OSHA analogs to Fire Code (e.g.):
  - Compressed Gases
  - Egress
  - Emergency Plans
  - Hazardous Materials
  - Hot Work
  - Ammonia Refrigeration
  - Spraying and Dipping with Flammable or Combustible Liquids
- ▶ NFPA standards put “meat on the bones” of some OSHA regulations





# General Safety Requirements

- ▶ Fire Drills
- ▶ Emergency Plans and training
- ▶ Powered Industrial Trucks
- ▶ Storage of combustible materials



# Pause for... Questions?





# Hazardous Materials – NFPA 1 Chap. 60

- ▶ 14 categories
- ▶ 4 levels of High Hazard materials
- ▶ MAQ per control area – see tables for different occupancies
- ▶ Storage/use exceeding MAQ per control area
- ▶ Personnel training

# Example MAQs per Control Area

## ▶ Industrial Occupancy

- Flam cryo fluid 45 gal
- Flammable solid 125 lb
- Pyrophoric 4 lb
- Corrosive liquid 500 gal
- Corrosive solid 5000 lb
- Toxic solid 500 lb
- Toxic liquid 500 lb
- Highly toxic solid 10 lb
- Highly toxic liquid 10 lb

## ▶ Health Care Occupancy

- Flam cryo fluid 10 gal
- Flammable solid 5 lb
- Pyrophoric NP
- Corrosive liquid 100 gal
- Corrosive solid 1000 lb
- Toxic solid 125 lb
- Toxic liquid 125 lb
- Highly toxic solid 3 lb
- Highly toxic liquid 3 lb

## Flammable/Combustible Liquids MAQ per Control Area

### ▶ Flammable liquids

- Class IA 30 gal
- Class IB or IC 120 gal
- Class IA, IB, IC combined 120 gal

### ▶ Combustible liquids

- Class II 120 gal
- Class IIIA 330 gal
- Class IIIB 13,200 gal

# Specific Types of Hazardous Materials

- ▶ NFPA 1 has specific chapters on (for example):
  - Aerosol products
  - Compressed gases
  - Corrosive solids and liquids
  - Flammable and combustible liquids
  - Flammable solids
  - Oxidizers
  - Pyrophoric materials
  - Water-reactive materials
  - Etc.



# Combustible Dust Control

- ▶ Chapter 40... and up to 8 other standards
- ▶ Continuous suction and conveyance to dust collectors
- ▶ Minimize dust clouds during cleaning
- ▶ Sources of heat controlled
- ▶ Fire protection systems
- ▶ O&M procedures and emergency plans
- ▶ Employee training
- ▶ Inspection, testing and maintenance program



# Stationary Battery Systems

- ▶ Size thresholds:
  - 100 gal for lead–acid or NiCd in sprinklered bldgs
  - 50 gal for lead–acid or NiCd in unsprinklered bldgs
  - 1000 lb for lithium–ion and lithium metal polymer
- ▶ Plans approved by AHJ
- ▶ Separation requirements by occupancy type
- ▶ Spill control and neutralization of electrolyte
- ▶ Ventilation requirements
- ▶ Seismic bracing may be required

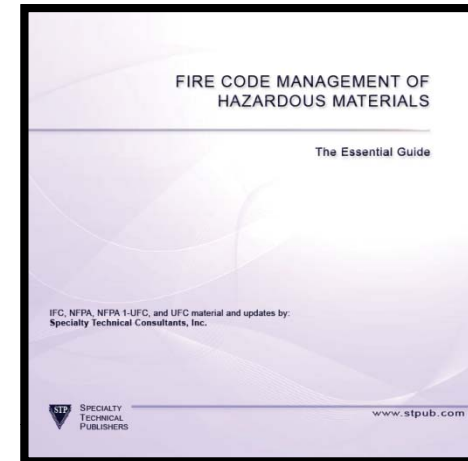


# To Summarize...

- ▶ “License to Operate”
- ▶ Determine applicable Fire Code requirements
  - State adopted code – and amendments?
  - Municipal code – and amendments?
- ▶ Review and assure compliance
- ▶ Maintain good relations with the AHJ

# Where to Learn More

- ▶ STP ([www.stpub.com](http://www.stpub.com))  
*Fire Code Management of Hazardous Materials:  
The Essential Guide*
- ▶ Your State or Local Fire Marshal
- ▶ The International Code Council  
([www.iccsafe.org](http://www.iccsafe.org))
- ▶ The National Fire Protection Association  
([www.nfpa.org](http://www.nfpa.org))
- ▶ Municode ([www.municode.com](http://www.municode.com))





# That's all the time I have...

## Any questions?

Russ Boesch, CPEA, CHMM  
Senior Program Director  
Specialty Technical Consultants, Inc  
rboesch@stcenv.com

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