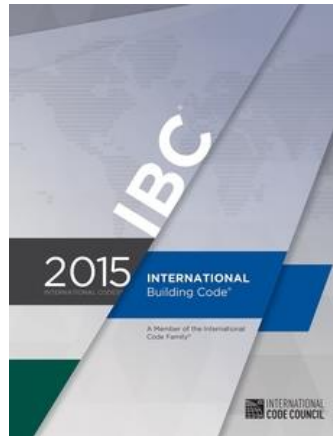


Planning for the Differences in the New 2015 IBC

November 9, 2017

David R. Soens



Wisconsin Healthcare Engineering Association

Overview

- **Code Relevance**
- **Differences**
- **Resolution Techniques**



Regulation Prevalence

- Car you drive
- Phone radio signals
- Airplane flight pattern
- Electricity in your home
- Pacemaker in one's chest



Regulations Provide

- **Peace and order**
- **Health and safety**
- **Mutual convenience**



Focus

Person 1 = Person 2

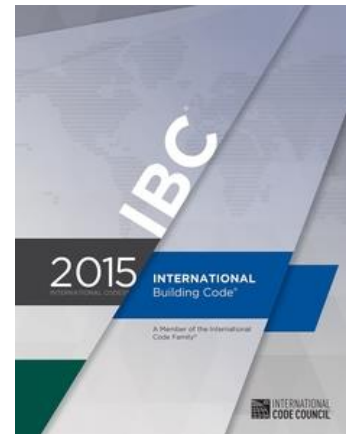
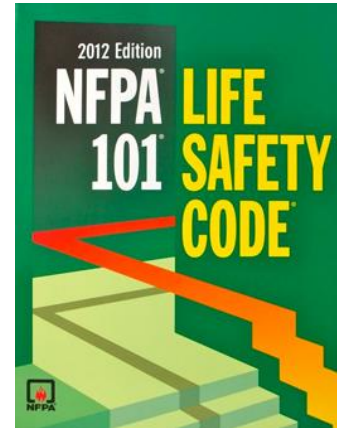
Facility 1 = Facility 2

Code Group 1 = Code Group 2



Code for Discussion

- **National Fire Protection Association (NFPA)**
 - Life Safety Code NFPA 101
 - **2012** Edition
- **International Code Council,**
Pending Approval
 - *International Building Code*
 - **2015** Edition



NFPA versus ICC

**Occupant
vs
Fire Department**



Scope

LSC	IBC
Comprehensive	--
--	Code-in-Effect

OR Surgical Supplies

2012 LSC Existing Provisions

- 1-day supply
 - Surgical application
 - Not a hazard
-
- | | |
|-------------|-------|
| • IBC ? | Y2002 |
| • COMM 58 ? | Y1998 |
| • ILHR 58 ? | Y1984 |



Egress Door Locking

LSC	IBC
Access Control	Access Control
Delayed-Egress	Delayed-Egress 2 max
Clinical Needs	Clinical Needs
<u>Security</u> of Patient	NA

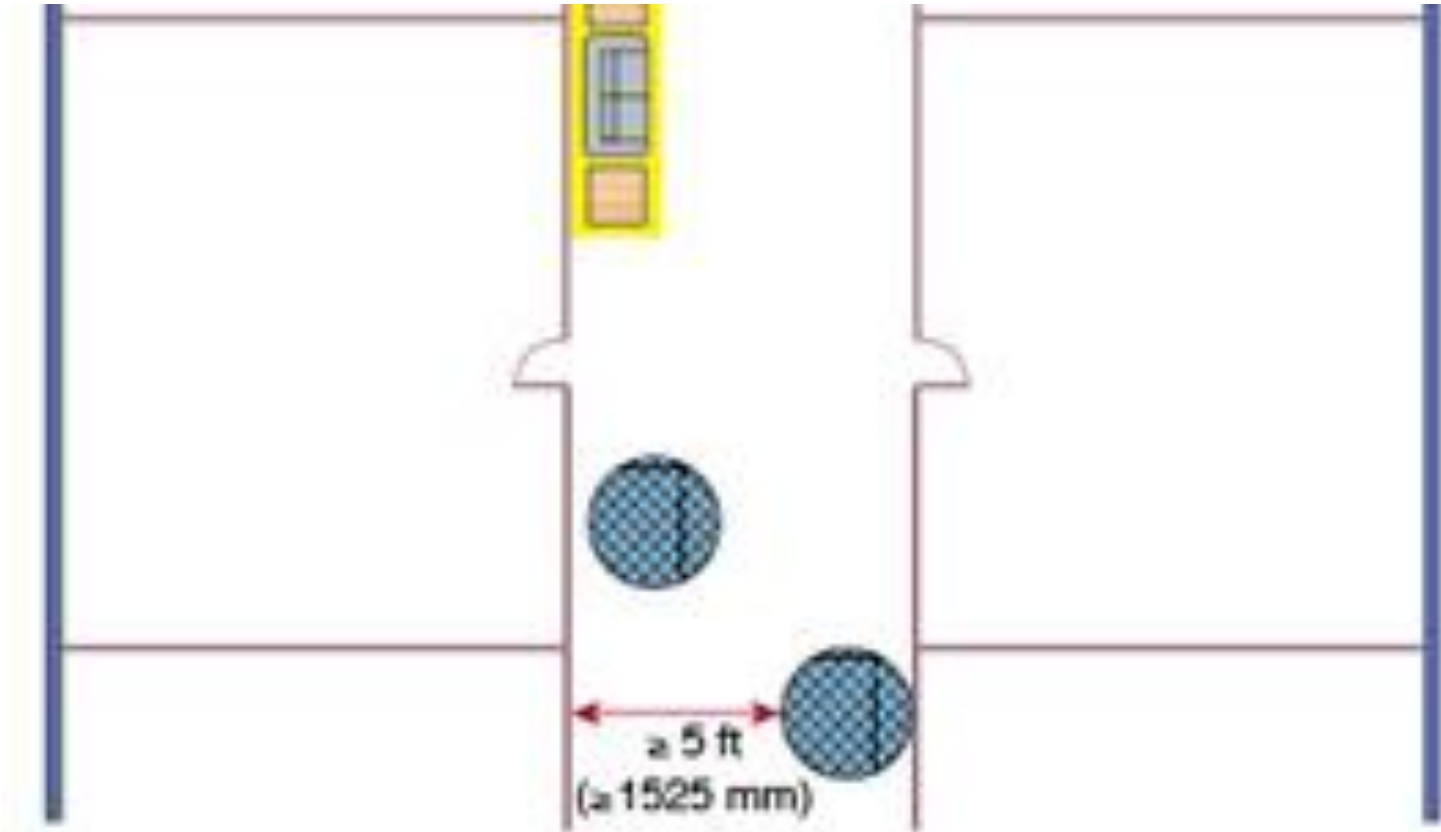
Habitable Room Exit Access

LSC	IBC
Corridor	Corridor
Suite	Suite
Outside	Outside
Horizontal <u>Exit</u>	NA

Corridor Use

LSC	IBC / IFC
Fixed Furniture	Fixed Furniture
Medical <u>Equipment</u>	NA

Operational – Example



Outside Window / Door

CMS	IBC
Federal Requirement	Natural or Artificial Lighting
Every <u>patient</u> sleeping room	NA

Cooking

LSC	IBC
Corridor Use	Corridor Use
30 beds or less	30 occupants or less
Commercial Equipment	<u>Domestic</u> Equipment
Controls	Controls

Smoke Compartment

LSC	IBC
All floors with care or treatment	All floors with care or treatment
200 max travel	200 max travel
30 nsf / person	30 nsf / person
22,500 sf	<u>40,000</u> sf

Accessible Means of Egress

LSC	IBC
Required	Required
--	Two-way Communication for Passenger Elevator
--	Exit Discharge Protection
--	Exceptions

Sprinkler Protection

LSC	IBC
Ambulatory Health Care Facilities	Ambulatory Care Facilities (ACF)
Construction Type	Sprinkler <u>entire floor</u> of care in ACF
Number of Stories	

Structural

LSC	IBC
Required	Required
--	Risk Category
--	Health Care RC = IV

Electrical

LSC	IBC
NFPA 70	NFPA 70 SPS 316
Article 517	Article 517
Limited	Health Care Facility definition = “mobile <u>or</u> <u>portable enclosures</u> ”

Electrical Feeders

LSC	IBC
NFPA 70	NFPA 70 SPS 316
Article 700	Article 700
Limited	Fire Protected Feeders for <u>Health care</u> occupancies

Fire Places

LSC	IBC
Direct-vent gas <u>fireplaces</u>	NA
Inside smoke compartment	NA
Sleeping rooms*	NA
Controls	NA

Ventilation

LSC	IBC
Required	Required
2012 NFPA 99	SPS 364
--	2014 FGI
2008 ASHRAE 170	<u>2013</u> ASHRAE 170

Medical Gases

LSC	IBC
Required	Required
2012 <u>NFPA 99</u>	NA
Risk Based	NA

Resolution ?

Functional Dependence

- Survey
 - Federal
- Construction
 - State and Federal
- Licensure
 - State



Resolution ?

System Dependence

- Emergency power
 - Life Support
- Fire protection
 - Life Safety
- Comfort
 - Ventilation



Resolution Technique Types

Method	Code
Code	LSC & IBC
Equivalency	LSC & IBC
Analysis	LSC & IBC
Process	LSC & IBC

Resolve 1: Code vs Code

Research

- Construction Documents
 - Code Sheet
- Law Library
 - Adopted Codes
- Facility Archives
 - Effective Dates



Code vs Code Example

LSC	IBC
Comprehensive	--
--	Code-in-Effect

Code Sheet

Dates of Construction per Building

Height in Stories per Building

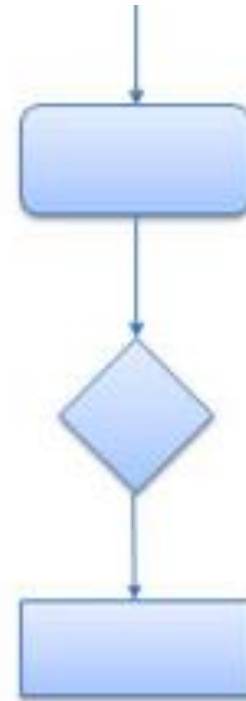
Construction Type per Building

Sprinkler Protection per Building

Resolve 2: Code Rules

Written

- Most Restrictive Prevails
 - Administration
- Detail Prevails over General
 - Specific >> General
- Side by Side Comparison
 - Highlight Differences



Code Rule Example - MedGas

LSC	IBC
Required	Required
2012 NFPA 99 <u>Medical Gas</u>	Limited

IBC has limited to no requirements for medical gas systems
Most restrictive of LSC prevails
Meeting BOTH codes

Resolve 3: Equivalency

Waivers

- Can't Meet Code
- No Health / Safety Impacts
- Tradeoff's Improve Acceptance
- Subject to Revocation
- Unreasonable Hardship to Meet Code
 - Financial Substantiation



Waiver Example - Window

CMS	IBC
Federal Requirement	Natural or Artificial Lighting
Patient sleeping room window / Door	NA

Survey Deficiency K381 - Life Safety Code Waiver Option
State Operations Manual (SOM) section 2480
Waiver request in Plan of Correction (POC)
State Recommendation
CMS RO Adjudication

Resolve 4: Equivalency

Variances

- Can Meet Code
- New technology / method
- Tradeoff's Required
- Jurisdictional Limitations
- Subject to Revocation



Variance Example - DEL

LSC	IBC
Access Control	Access Control
Delayed-Egress*	Delayed-Egress 2 max
Clinical Needs	Clinical Needs

State Level Plan Review or Inspection Finding

Petition for Variance to WI Commercial Building Code

DHS Form F-62537 : fee, signatures, municipal recommendations

Resolve 5: Equivalency

Engineering Judgement

- Can Meet Code
- Complicated / Unique Condition
- Fire Resistance Rating Design
- IBC 703.3



Engineering Judgement Example

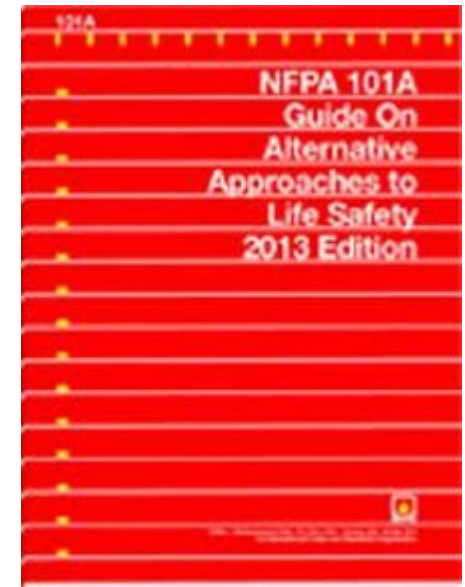
LSC	IBC
Type II (111)	Type 2A
NFPA 220	NFPA 220
---	Unique Column

**Fire protection engineered active and passive system
Combination of architectural materials and sprinkler protection
Engineering Judgement per IBC 703.3**

Resolve 6: Analysis

Fire Safety Evaluation System (FSES)

- NFPA 101A
- Straightforward Calculations
- Qualifications & Training
- In Lieu of Waivers



Analysis Example – Basic

LSC	IBC
Construction Type	COMM 58 ?
FSES	---

NFPA 101A – 2013 Edition

CMS 2786R completed and included

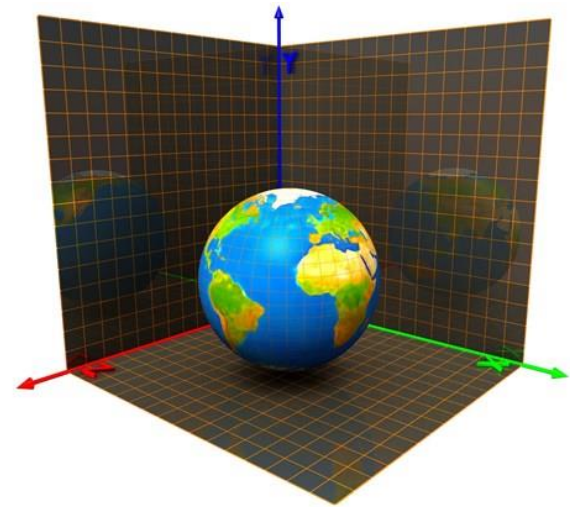
All Zones must Pass (0 or greater score)

Full sprinkler protection will not pass in all situations

Resolve 7: Analysis

Performance Based

- Computer Simulations
- Fire Scenarios
 - NFPA 101 Chapter 5
- Qualifications / Credentials
 - Fire Protection
- Assumptions

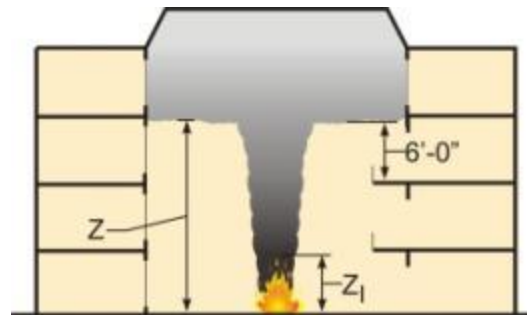


Analysis - Advanced

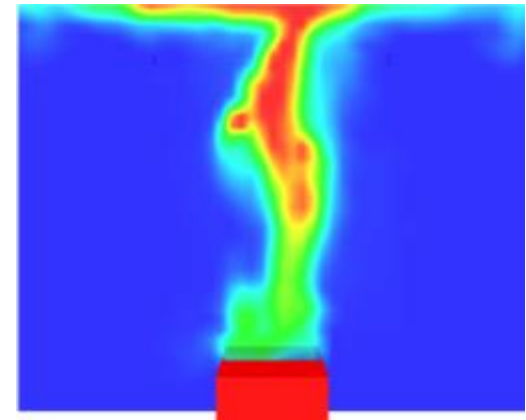
Engineering Calculations

- ▶ Flame height
 - $z_l = 0.533Q_c^{2/5}$
- ▶ Smoke production ($z > z_l$)
 - $m_p = 0.022Q_c^{1/3}z^{5/3} + 0.0042Q_c$

Zone Models



Computational Fluid Dynamics (CFD)



Analysis Example – Advanced

LSC	IBC
Performance Based	---
Computer Fire Modeling	---

Smoke Control for large-open spaces

Computational Fluid Dynamics (CFD) analysis

Simulates smoke detection, ventilation response, and suppression

Tenability criteria per NFPA 92, NIST, and NIOSH

Resolve 8: Process

Commissioning

- Performance Commitment
- Professional Expertise
- Remove Outdated Equipment
- System Consolidation



Process Example - Cx

LSC	COMM 58
22,500 smoke compartments	2 HR
Full sprinkler	Fire & Smoke Dampers

New addition and Existing High-Rise Structure

Commissioning for Arch, Struct, Mech, Elect, and Plumbing

Consolidation structure to New Codes

Motivation: Remove fire rated walls, doors, and dampers

Resolve 9: Process

Appeal

- Administrative
- Conference Review
- Hearing



Process Example - Appeal

LSC	IBC
Required	Required
--	ANSI A117.1

**DHS denied state petition based on conflict with federal
Facility appeal option based on SPS 303
Conference Review with DSPS**

Resolve 10 : Code Development

- Step 1 : **Scope**
- Step 2 : **Committee**
- Step 3 : **Public**
- Step 4 : **Implementation**



Process Example - Development

LSC	IBC
All floors with patients or treatment	All floors with sleeping or treatment
22,500 sf	40,000 sf

**WHEA Board approval for 4 members to attend
2018 NFPA Annual Conference in Boston MA
ASHE national effort to improve healthcare representation
Successfully overturned cumbersome proposals**

Do I have to document ?

Yes – Yes – absolutely Yes

Retain onsite in facility records

“Available upon request”



Summary

- **Code Relevance**
- **Differences**
- **Resolution Techniques**



Thank You

“ Give me six hours to chop down a tree and I will spend the first four sharpening the axe. ”

Abraham Lincoln
16th U.S. President