



Overview of Building Codes

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Credit(s) earned on completion of this course will be reported to American Institute of Architects (AIA) Continuing Education Session (CES) for AIA members.

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Course Description

Facilities managers are responsible for operating code compliant facilities – but much is open to interpretation. This course will address the importance of understanding building codes in educational settings, both in new construction and in existing facilities. Discuss which codes apply, understand the role of the code official, and learn how you can be involved in code advocacy.



Learning Objectives

1. Learn the importance of code compliance
2. Learn to understand building codes in educational settings
3. Learn which codes apply to educational settings
4. Learn to understand the role of code officials and learn how you can be involved in code advocacy

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Code History

- Why are codes needed?



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Code History

- Protect Life, Health, and Safety
 - Historically, codes were created after great disasters
 - Boston 1631 thatch roofs and wooden chimneys
 - Great London Fire 1666
 - Great Chicago Fire 1871
 - Great Baltimore Fire 1904
 - Iroquois Theater Fire 1903 (602)
 - exits, interior finish
 - Triangle Shirt-Waist Factory Fire 1911 (145)
 - exits, stairwells
 - Coconut Grove Fire 1942 (492)
 - exits, interior finish, occupant capacities
 - Hartford Circus Tent Fire 1944 (149)
 - exits, temporary structure flammability
 - Others, Recent ???
 - Think of changes today with urban/wildland interface, hurricane, seismic



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Code History



- Earliest Codes - Hammurabi's Code of Laws 1754 BC
 - #225 *If fire break out in a house, and some one who comes to put it out cast his eye upon the property of the owner of the house, and take the property of the master of the house, he shall be thrown into that self-same fire.*
 - #229 *If a builder build a house for some one, and does not construct it properly, and the house which he built fall in and kill its owner, then that builder shall be put to death.*
 - #233 *If a builder build a house for some one, even though he has not yet completed it; if then the walls seem toppling, the builder must make the walls solid from his own means.*

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Code History



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Code History



- Other safety concerns
 - Electrical
 - Gas
 - Plumbing
 - Mechanical
 - Hazardous materials
 - Accessibility
 - Others ???

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Compliance Can Be Law



- What is a code or regulation?
 - **Code** – a systematic statement of a body of law especially; one given statutory force. (Merriam-Webster)
 - **Regulation** – a rule or order issued by an executive authority or regulatory agency of a government having the force of law. (Merriam-Webster)
 - Regulations are written by public agencies or legislative bodies to define requirements that must be met regarding a specific area or issue and are enforceable by law.

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Compliance Can Be Law



- Standard - Is it law? It can be.
 - A document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose
 - Written by public or private groups to define a specific area or issue and offered to be adopted or referenced by others
 - Can be written to establish a minimum quality level
 - Standards can remove trade barriers, support free trade practices
 - Manufacturing standards can reduce cost
 - Standards can also be written to promote the commercial interests of product manufacturers and service providers
 - Colleges and Universities can have their own standards
 - Example Design Criteria Facilities Standard (DCFS) at UMD – specifies UMD specific requirement – colors to office sizes, manufacturers (3 for fire alarm systems), energy etc.
 - Standards may serve as the reference or requirement within a code or regulation

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Compliance Can Be Law



- NFPA standards vs. codes
 - Similar
 - Code is ready to be adopted into law by a jurisdiction
 - NFPA 70 National Electrical Code
 - NFPA 101 Life Safety Code
 - NFPA 1 Fire Code
 - Standards establish procedures and minimum quality levels
 - NFPA 1037 Professional Qualifications for Fire Marshals
 - NFPA 3000 Standard for Active Shooter Hostile Event Response (ASHER) Program
 - Standards may serve as the reference or requirement within a code or regulation
 - Guide – Advisory or informative – generally should not supersede government statutes or regulations, non-mandatory
 - NFPA 203 – Guide on Roof Coverings and Roof Deck Constructions Scope
 - NFPA 730 – Guide for Premises Security

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Which Codes Apply?



- States and local jurisdictions vary throughout the country
- Depends on where you are
- Depends on which edition of a code has been adopted by the jurisdiction
- Depends on any amendments to the code
- Depends on what type of institution you are
 - State/Public
 - Private

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Which Codes Apply?



- Some states have codes that apply state-wide
 - Example: Maryland – state fire code (NFPA) and building codes (ICC) are the minimum code, local jurisdictions can be more stringent. But, doesn't apply in Baltimore City
 - Example: Virginia – state code is maximum code (min-max)
- Some states have state codes that have to be adopted locally
 - Example: Pennsylvania (ICC)
- In some states, all codes are adopted locally
 - Example: Nevada

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Which Codes Apply?



- State institutions where state codes are enforced by the state
 - Example: Maryland, Oklahoma, Texas, California
- Private institutions where local codes are enforced
- Private institutions where the code is enforced by the state
 - Example: New York State Fire inspects all colleges and universities
- State institutions that regulate themselves
 - Example: University of Michigan

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Codes Change

- Codes, regulations, and standards are not static
 - Jurisdictions adopt a particular edition of year model code
- Standards-setting organizations and regulatory bodies will revise and update their standards on a regular basis.
- NFPA and ICC update their codes on a 3 year cycle.
- The individual jurisdictions must then decide to adopt all, some, or none of the updated edition of the code, and set a date for the revised code to become effective.



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Codes Change

- Examples of Diversity of Building Codes by State (as of Jan 2018)
 - Maine - IBC 2009
 - New Hampshire – IBC & IRC 2009
 - Vermont – IBC 2015
 - New York – IBC 2015
 - Pennsylvania – IBC 2009
 - Kentucky – IBC 2012 & IRC 2012
 - California – IBC 2015
 - Florida – IBC 2012



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Which Codes Apply?



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Which Codes Apply?



Which Codes Apply?



Which Codes Apply?



Which Codes Apply?



Which Codes Apply?



Which Codes Apply?



<http://www.iccsafe.org/about-icc/overview/international-code-adoption/>

Codes Change – Why?



- Reasons vary. It often comes down to a belief by the authoring body that the change improves health and safety of occupants, streamlines the design, construction, or enforcement of health and safety features, or in the case of energy codes, saves energy.
- Many changes are brought forth by safety professionals seeking to raise building safety or plug safety loopholes.
- Still other changes are brought forth by special interests ostensibly for the same purpose, but which will also provide a financial benefit to the special interest if adopted.

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Codes – What’s Out There?



- We operate in an increasingly complex myriad of codes, mandates, regulations, and industry standards
- Standards impact nearly every facet of not only the design and construction process, but also operations and maintenance activities
- There are several hundred standards and codes writing bodies, both private and public, that write and update thousands of individual documents every year
 - NFPA (National Fire Protection Association)
 - ICC (International Code Council)
 - ANSI (American National Standards Institute).
 - ASHRAE (American Society of Heating, Refrigerating and Air Conditioning Engineers)

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What Is a Model Code?



- NFPA and ICC use an open, consensus based public process to develop generic code language. The completed standards and codes are then made available for individual jurisdictions to adopt into law.
- Each adopting jurisdiction then stipulates its own procedural and enforcement rules. It may modify any provisions in the model code as it sees fit.
- Typically enforcement is accomplished at the local level (except for State and Federal property) and the local enforcer has the option to modify the model code.

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Code Development



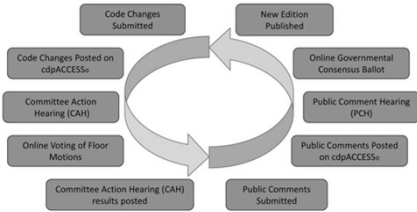
- Most standards bodies and codes-setting organizations follow a similar path
- Proposal Stage
 - Proposals for change are called for and received
 - Proposals are reviewed by a Committee for acceptance, and a first draft of the proposed accepted changes is published.
 - Public Comment Stage
 - Comments from interested parties and the public are received.
 - Committee reviews comments and prepares second draft of proposed changes if necessary.
 - Committee votes to adopt final changes.



Code Development



ICC Code Development Process



For schedule of all dates in cycle, click here:
<http://www.iccsafe.org/cs/codes/Pages/cycle.aspx?usertoken={token}&Site=icc>



Code Development



NFPA Standards Development Process

Step One: Public Input Stage

First Draft Report posted after public comments are accepted

Step Two: Public Comment Stage

Public comment on first draft received, Second Draft Report is then posted

Step Three: NFPA Technical Meeting

Technical Committee votes on Second Draft; NITNAM process allows for further deliberation at Annual Meeting.

Step Four: Standards Council Action

Standard is approved; appeals process exists in the event any stakeholders question the standards development process outlined by NFPA.



Take Part In Code Development



- NFPA
- Anyone can be a member
- Members can vote
- Members can be on Technical Committees
 - Must apply
 - Technical Committee members are selected based on representative classifications
 - Manufacturer
 - User
 - Installer/Maintainer
 - Labor
 - Applied Research/Testing Laboratory
 - Insurance
 - Consumer
 - Special Expert

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Take Part In Code Development



- ICC
 - Most anyone can be a member
 - Only Governmental Members can vote
 - Public college and university employees engaged in administration, formulation, or enforcement of laws, regulations or ordinances relating to public health, safety and welfare can be Governmental Members
 - A Governmental Member may designate 4-12 voting representatives based on population
 - 0 to 50,000 – 4
 - 50,000 – 150,000 – 8
 - Over 150,000 – 12
 - University of Maryland
 - 40,000 students, 11,000 employees
 - 4 voting representatives
 - Other membership categories (non-voting): Corporate, Individual

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Take Part In Code Development



- APPA Code Development Activities
- The APPA Standards and Codes Council
 - Established in July 2012 by APPA
 - A permanent Council, reporting to the APPA Board of Directors
- Mission
 - Promote codes and standards awareness among member institutions.
 - Determine impacts of existing codes and proposed standards.
 - Influence codes and standards development and outcomes.
 - Display APPA's Leadership in standards and codes, seek pragmatic solutions.
 - Identify broad consensus among APPA members on standards and codes issues, seek appropriate representation within standards bodies.
- NFPA Workgroup and ICC Codes Workgroup

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Take Part In Code Development



- APPA Code Development Activities
- ANSI accredited standards developer (ACD)
- Currently working to develop and publish American National Standards (ANSI Standards) supporting Total Cost of Ownership (TCO) principles for facilities and infrastructure, and for Facilities Management, as applicable to the education sector and as they relate to the following four core competencies as identified by the education sector:
 - General Administration & Management
 - Maintenance & Operation
 - Energy & Utilities
 - Planning, Design & Construction

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“High Impact” Standards and Codes for Educational Facilities



- International Code Council (ICC)
 - IBC (International Building Code)
 - IFC (International Fire Code)
 - IMC (International Mechanical Code)
 - IPC (International Plumbing Code)
 - IECC (International Energy Conservation Code)



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“High Impact” Standards and Codes for Educational Facilities



Code	Title	Revision Date	13	Standard for the Installation of Sprinkler Systems	2019
			26	Standard for the Installation of Stationary Pumps for Fire Protection	2019
25	Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems	2010	24	Standard for the Installation of Private Fire Service Mains and Their Appurtenances	2019
70	National Electric Code	2010	45	Standard on Fire Protection for Laboratories Using Chemicals	2019
96	Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations	2011	71	National Fire Alarm and Signaling Code	2019
1618	Standard for Mass Evacuation and Sheltering	2010	80	Standard for Fire Doors and Other Opening Protectives	2019
90A	Standard for the Installation of Air-Conditioning and Ventilating Systems	2011	110	Standard for Emergency and Standby Power Systems	2019
1	Fire Code	2011	100	Standard for Fire and Life Safety in Animal Housing Facilities	2019
3	Recommended Practice for Commissioning of Fire Protection and Life Safety Systems	2011	211	Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances	2019
4	Standard for Integrated Fire Protection and Life Safety Testing	2011	1800	Standard on Disaster/Emergency Management and Business Continuity Programs	2019
30	Flammable and Combustible Liquids Code	2011			
99	Health Care Facilities Code	2011			
101	Life Safety Code	2011			



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“High Impact” Standards and Codes for Educational Facilities



- American Society of Heating, Refrigerating, and Air Conditioning Engineers
 - ASHRAE 90.1 – Energy Standard for Buildings Except Low-Rise Residential Buildings (2013)
 - ASHRAE 90.2 – Energy Efficient Design of Low Rise Residential Buildings (2007)
 - ASHRAE 189.1 – Standards for the Design of High Performance Green Buildings Except Low-Rise Residential Buildings (2014)
 - ASHRAE 189.3 – Design Construction and Operation of Sustainable High Performance Health Care Facilities



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“High Impact” Standards and Codes for Educational Facilities



Group Activity

Identify standards and codes on your campus that you think are challenging to comply with and why.

How would you change these standards, if you could?

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Code Enforcement





- Code Official
 - Has Authority
 - Enforces compliance with codes
 - Reviews construction plans
 - Gives approvals
 - Renders interpretations
 - Issues permits where applicable
 - Conducts inspections
 - Issues notices and orders
 - Maintains records

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Code Enforcement

- Campus Code Official/Fire Marshal
- Authority may be administrative
 - Policy
- Authority may be legal
 - Mostly at public institutions
 - Based on MOUs, agreements, or laws
- Examples
 - Fire Marshal authority from State Fire Marshal
 - Maryland, Oklahoma, Texas, Georgia, California
 - Building Official authority from state government
 - New York


Code Enforcement

- Authority Having Jurisdiction (AHJ) (NFPA)
 - An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.
- Fire Marshal (NFPA)
 - A person designated to provide delivery, management, and/or administration of fire protection- and life safety-related codes and standards, investigations, education, and/or prevention services for local, county, state, provincial, federal, tribal, or private sector jurisdictions as adopted or determined by that entity.
- Do not have to be legal/government authority
 - Insurance
 - JCAHO – Joint Commission on Accreditation of Healthcare Organizations


Overview of Building Codes

Questions



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This concludes The American
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