Welcome to the
2018 Annual Conference
Educational Sessions
Session: 2018 IFC Essentials –
General Precautions Against Fire
2018 IFC® Essentials: General Precautions Against Fire

Based on the 2018 International Fire Code® (IFC®)
Welcome

- Instructor introduction
- Exits
- Breaks and Schedule
- Cell Phones
- Student Introductions
Identify the general precautions against fire in the 2018 IFC
OBJECTIVES

1. Explain the fundamental provisions of the 2018 IFC.
2. Describe the intent and scope of the 2018 IFC.
3. Identify common fire hazards and understand how the 2018 IFC addresses correction, mitigation or elimination of the hazards.
4. Describe general precautions against fire.
Guide to a successful class:

- Slides contain some text and images to help you learn
- Follow along in the course handout
- Ask Questions, ask questions, ASK QUESTIONS!!!!
Introduction Activity

- Introduce yourself to two people you do not know.
Overview of the IFC
The International Fire Code

- Major themes of the IFC
  - Protection of the occupants
  - Protection of the public
  - Protection of the emergency responders
- The IFC addresses various hazards
  - Building use and operation
  - Storage and use of combustible materials
  - Storage and handling of hazardous materials
  - Fire department access
  - Water supplies
ICC Code Development Cycle

- New code published every 3 years
- 12 month code change cycles
- Codes divided into 2 groups
  - IBC, IFC, IFGC, IMC, IPC, IPMC, IPSDC, IRC, ISPSC, IWUIC
  - Admin, IBC-S, IEBC, IECC, IgCC, IRC-B

Code change cycle as of March 1, 2018

Code changes submitted

Code changes available

Committee Action Hearing

Online Floor Motion Voting

Report of CAH

- IFC is in Group A
- Code change cycle in 2018, 2021, etc.

Public Comments available

Public Comment Hearing

Online Governmental Consensus Vote

New edition published
IFC – International Fire Code

- Provides a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings and facilities
- Addresses design, construction, installation, testing and maintenance of fire protection systems
- Contains regulations for the safety of firefighters and emergency responders during emergency operations
Navigating the IFC

- 7 major parts to the IFC

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</table>
Applicability
§102.1

- IFC construction requirements apply to:
  - Structures, facilities and conditions that arise after the code is adopted
  - Existing structures, facilities and conditions not legally in existence at the time the code is adopted
  - Existing structures, facilities and conditions when required by Ch 11
  - Existing structures, facilities and conditions which, in the opinion of the FCO, constitute a distinct hazard to life

  IF the appendices are adopted:
  - Appendix K (ambulatory care facilities)
  - Appendix M (sprinklers in high-rise)
Applicability
§102.2

- IFC administrative, operational and maintenance requirements apply to:
  - New conditions and operations arising after the adoption of this code
  - Existing conditions and operations
Retroactive Application of Construction Requirements

- §102.1 Item 3 refers to Ch 11
- Ch 11 contains retroactive construction requirements for existing buildings
- Ch 11 establishes minimum safety requirements for existing buildings
  - Protection of open vertical shafts
  - Installation of a fire alarm system in buildings which represent a high life safety risk
  - Provide minimum egress door widths

- Ch 11 requirements are less restrictive than new construction requirements
- Ch 11 is designed to mitigate specific life hazards in existing buildings
Change of Use or Occupancy
§102.3

- The C of O can be used to verify the building’s occupancy or use has not changed
- IFC generally prohibits a change of occupancy or use unless the change is done in conformance with the IBC
- Some changes are allowed when:
  - It does not change the overall use or character of a building
  - It reduces the hazard
Historic Buildings
§102.6

- Historic buildings generally must be maintained in their original condition
- Historic buildings may lack fire safety features normally required for new buildings having the same occupancy classification
- Unless the building is a distinct hazard, the IFC requires that historic structures be provided with fire protection and life safety features based on an approved fire protection plan
Codes and Standards §102.7

- “Codes” are documents that are adopted by the local authority in your jurisdiction
  - Requirements in the code supersede the requirements in the referenced standard
  - It does not matter which is more ‘restrictive’
  - It is based on the hierarchy of the codes

- “Standards” are documents referenced in the codes
  - Tell people how to achieve what must be done
  - Referenced standards are in Ch 80
Appendices
§101.2.1

- Developed the same as main body of the code
- Some are designed to be adopted
- Some are intended as additional information
- May provide guidelines, examples of recommended practices, or supplemental information
- May assist in the determination of alternative materials or methods
- Appendices have no legal status until specifically recognized in the adopting ordinance or legislation

- Appendix A  Board of Appeals
- Appendix B  Fire-flow
- Appendix C  Fire Hydrants
- Appendix D  Access
- Appendix E  Hazardous Materials
- Appendix F  Hazard Ranking
- Appendix G  Cryogenic Conversions
- Appendix I  Non-compliant Fire Protection Systems
- Appendix J  Building Information Signs
- Appendix K  Ambulatory Care Facilities
- Appendix L  Fire Fighter Air Replenishment Systems
- Appendix M  Sprinklers in Existing High-rise
- Appendix N  Indoor Trade Shows and Exhibitions
Authority
§104

- Local jurisdiction creates the Department of Fire Prevention
- A Fire Code Official (FCO) is appointed to manage the fire prevention office
- Reviews plans, issues permits, inspects work to comply with code and plans
- Interprets code requirements
- Develops policies and procedures to clarify local application of the code
The code allows the FCO to obtain technical assistance when a plan or project involves a design or system that is complicated or technically challenging. FCOs can use third-party assistance to:

- Review design drawings and specifications
- Verify a design complies with the IFC

Cost of the review and any reports is the responsibility of the permit applicant. Final approval rests with the FCO. Such as:

- Hazardous material use and processes
- Sprinkler design for an extra-high rack storage
- Specialized automatic fire protection systems
Alternate Materials and Methods §104.9

- The designer can submit a request to meet code requirements using Alternate Materials and Methods.
- The FCO reviews alternate designs to determine if they comply with the code.
- The alternative must match the strength, effectiveness, fire resistance, durability, and safety of the code.
- ICC Evaluation Service provides reports and evaluation process.

**ICC Evaluation Service**

**ESR-2397**

This report is subject to renewal February 2018

A Subsidiary of the International Code Council

https://www.icc-es.org | (800) 423-6587 | (562) 699-0543

**DIVISION:** 21-06-30 FIRE SUPPRESSION

**Section:** 2113.15-Non-Insulated Sprinkler Systems

**REPORT HOLDER:**

TYCO FIRE PROTECTION SYSTEMS

1447 ELMWOOD AVENUE

CRANSTON, RHODE ISLAND 02919

(401) 761-4220

**EVALUATION SUBJECT:**

**MODEL:** WFR-85-40 FACTOR SPECIFIC APPLICATION WINDOW SPRINKLERS, HORIZONTAL SIDEWALL AND PENDENT VERTICAL SIDEWALL

**1.0 EVALUATION SCOPE:**

Compliance with the following codes:

- 2013 Abu Dhabi International Building Code (ADIBC®)

For the purpose of this report only, the terms and conditions described in this report are as defined in the IBC.

**Property Evaluated:**

Alternative to a fire-resistance-rated wall assembly

**2.0 USES:**

The automatic special-purpose sprinkler system incorporating the Model WFR™ sprinkler is required in conjunction with a fire-glazed wall assembly to provide an affordance to a two-hour fire-resistance-rated method.

**3.0 DESCRIPTION:**

- **General:**
  - The Model WFR™ window sprinklers are used as part of a wall fire suppression system to provide a two-hour fire-resistance rating to an interior non-insulated barrier, the barrier to exterior wall assembly consisting of fire-resistance-rated exterior wall glazing in this report. When activated, the sprinklers are designed to provide the entire surface of the effective width of the fire-resistance-rated exterior wall assembly with sprinkler water. The system is not protected by a protective barrier. The interface details and testing method must be approved by the code official.

**4.0 INSTALLATION:**

- **4.1 Sprinkler Orientation:**
  - The Model WFR™ horizontal wall sprinkler shall be mounted on the exterior wall assembly in accordance with Section 2.0 USES of this report. The sprinkler shall be installed on the exterior wall assembly in an orientation to provide the required fire-resistance rating.
Permits §105

A permit is required to:

- Perform certain hazardous operations
- Construct or alter fire protection systems
- Install equipment for storage, handling or use of hazardous materials

2 types of permits:

- Operational
  - 50 operational permits
- Construction
  - 25 construction permits

- Place of assembly
- Storage or use of haz mat
- High-piled combustible storage
- Storage tank for haz mat
- Security gates on access roads
Permits
§105

- It is very common for a particular facility or regulated use to require both a construction permit and an operational permit
  - Installation of explosives magazine
  - Storage, use and handling of explosives
  - Installation of aboveground storage tanks
  - Dispensing of flammable and combustible liquids
Construction Documents
§105.4

- Drawings
- Specifications
- Prepared by a registered design professional where required by the statutes of the state or jurisdiction
  - FCO can waive this requirement
  - when the work does not require
  - a registered design professional
- Manufacturer’s installation instructions
 Permit Application §105.2.4

- The FCO reviews the plans for compliance with the code and other applicable laws of the jurisdiction.
- FCO can perform inspections of buildings, processes or systems before the permit is issued.
- This inspection may establish any operational constraints or limits.

If the plans are found in compliance, a permit can be issued for the work.

If the plans have discrepancies, a plan review report (compliance list) is provided to the applicant.
Inspections §107

- Inspectors check the installation to confirm conformance with the approved design documents
- Inspectors evaluate fire protection systems to confirm installation according to design standards
- An inspection may be required for licensing of day care and health care occupancies
- An inspection is required before an operational permit can be issued
Right of Entry

- Permission to perform the inspection must be obtained from the property owner, tenant or an individual authorized to allow entry onto the property.
- A property owner can refuse an inspector’s entry into a building or onto a site.

There are key points to remember:

1. Identify yourself – carry ID in addition to uniform
2. Obtain permission and consent from a responsible individual with the business, building or site
3. Inform the individual of the basis for inspection
4. A business may request a copy of the legal basis for an inspection – IFC §106 and §104.3
5. Once consent is granted, the inspection can proceed.

4th Amendment to the U.S. Constitution
Testing and Operation
§108.2

- Fire protection and life safety systems are inspected, tested and approved at initial installation
- Owner is responsible to maintain the operational readiness of the system
  - Many systems require annual inspection or testing
  - Owner must maintain records
- Records must be available for review by FCO
Unsafe Buildings §111

- The FCO has the authority to require corrections to bring a building or system into compliance when a serious fire or life safety threat is found.
- This authority extends to systems or items regulated by the IFC.
- If the violation constitutes an imminent danger, the FCO is authorized to require the partial or complete evacuation of the building and prohibit re-entry.

Photo courtesy of New Orleans Fire Department, LA
Stop Work Order
§112

- The FCO is authorized to issue a Stop Work Order
- In the IFC, Stop Work Orders can be issued for:
  - Work performed without obtaining the required Operational or Construction permits
  - Work that has concealed components which have not yet been inspected
  - Work regulated by the IFC
- Stop Work Orders are an immediate order to stop
Board of Appeals  
§109

- The FCO is responsible for interpretation of the IFC
- A property or business owner has the right to legally challenge those interpretations
- The Board of Appeals evaluates the information against the intent of the code and renders a decision regarding the interpretation of the code
- The appellant must claim the FCO has erred in interpreting the code or has wrongly applied a code section
- The Board of Appeals cannot waive code requirements

Appendix A contains guidelines on establishing a Board of Appeals
Part I – Code Administration & Enforcement

1. T  F  The design and use of a building or property can never stray from the requirements found in the IFC.

   False
   The design and operation must meet the intent of the code; alternate methods approved by the fire code official are allowed.

2. T  F  All of the I-Codes work separately and independently of each other.

   False
   The I-Codes work as a set of codes, each applying to a specific portion of the facility.
3. After a building receives a Certificate of Occupancy, how often does the IFC require fire inspections to be conducted?

As often as deemed necessary
IFC § 107.2

4. When the FCO arrives to conduct an inspection, the building owner refuses to allow the inspection. Does the FCO have the authority to demand the inspection? What options are there?

- Owner has the right to refuse the inspection
- FCO cannot demand inspection
- FCO can obtain an inspection warrant (administrative warrant)
  IFC § 104.3
General Safety Requirements
Combustible Materials
§304

- Orderly storage
- Located away from ignition sources
- Separation from means of egress
- Separation from concealed spaces
- Dumpsters located ≥5’ from combustible construction, wall openings and combustible roof eaves
Outdoor Pallet Storage
§315

- Wood pallets
  - Table 315.7.6(1)
- Plastic pallets
  - Table 315.7.6(2)
- Listed plastic pallets should be considered under the table for wood pallets

Type IIB Building

- No windows in exterior wall
- Pile size ≤400 ft²
- ≤45’ separation
- ≤20’
Open Flames §308

- Separation of uses and activities involving potential sources of open flames from combustible materials

  - Pour 1 ounce at a time
  - In the immediate vicinity of the table being served
  - Not transported or carried while burning
  - Wet towel immediately available
  
  IFC §308.1.8

- Liquid- or solid-fueled lighting devices of >8 oz. must self-extinguish if tipped over
- Devices must not leak at a rate >0.25 teaspoon per minute if tipped over

  IFC §308.3.1
Vacant Premises §311

- Safeguarding vacant buildings
  - Openings into the structure are protected from unauthorized entry
  - Hazardous materials removed
  - Fire protection systems should be maintained in service

This can be difficult in:
1. Cold weather environments can freeze water
2. Hot, humid environments can cause corrosion in electronic components

FCO can permit systems to be disabled, provided that combustibles and haz mat are removed, and the building does not represent a hazard – IFC §311.2
Hazards to Fire Fighters
§316

- Trap doors must be closed
- Shaftway markings
- Obstructions <7’ above the surface of a roof:
  - Must not create an obstruction, or
  - Must be protected or identified to emergency responders

Methods of protection:
- 2” white protective collar
- Physical barrier

The provision applies to roofs with a slope of ≤30°.
Indoor Display of Vehicles

§314

- \( \leq 5 \) gallons or \( \frac{1}{4} \) tank of fuel
- Fuel tank fill opening closed and sealed
- No fueling or defueling inside building
- Batteries disconnected?
  - Depends on vehicle and built-in safety features
Rooftop Gardens and Landscaped Roofs
§317

- Landscaped portion of the roof is limited in size
  - Maximum area of 15,625 ft²
  - Maximum dimension of 125’
- Additional landscaped areas
  - Separated by 6’
  - Roof rating of separation must be Class A

- When a standpipe is already provided in the building, it must be available to all landscaped areas
- Landscape maintenance plan required
Mobile Food Preparation Vehicles
§319

- Permit required
- Cooking oil storage
  - Metallic tanks or listed nonmetallic
- Fire-extinguishing system if grease-laden vapors are produced
- Fuel gas storage
Public Assemblies and Events
§403

- Public assemblies and events can occur inside buildings or outdoors
- Public assemblies in other than Group A or E, the FCO can require a public safety plan
  - Fire apparatus access
  - Emergency medical response
  - Law enforcement
- Fire watch
- Crowd Managers

Crowd managers required when:
- OL >500 inside a building
- OL >1,000 for place of religious worship
- OL >1,000 for outdoor event
Fire Safety and Evacuation Plans
§404

- Fire Safety & Evacuation Plans are required in:
  - Group A except for place of religious worship with OL of <2,000
  - Group B ambulatory care facility
  - Group B, F and M with an OL ≥500 or an OL >100 above or below the level of exit discharge
  - Group F – if required in pallet manufacturing or recycling facility
  - Group E, H, I, R-1, R-2 college & university buildings, and R-4
  - Covered malls and open malls >50,000 ft²
  - Underground buildings
  - Group A, E or M with an atrium
  - High-rise buildings of any occupancy
  - Buildings using occupant evacuation elevators
  - High-piled storage >500,000 Class I – IV, >300,000 high-hazard
a. In severe climates, the FCO shall have the authority to modify the emergency evacuation drill frequency.

b. Emergency evacuation drills are required in Group B buildings having an occupant load ≥500 persons or >100 persons above or below the lowest level of exit discharge.

c. Emergency evacuation drills are required in ambulatory care facilities in accordance with §403.3.

d. Emergency evacuation drills in Group R-2 college and university buildings shall be in accordance with §403.10.2.1. Other Group R-2 occupancies shall be in accordance with §403.10.2.2.

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<th>GROUP OR OCCUPANCY</th>
<th>FREQUENCY</th>
<th>PARTICIPATION</th>
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<tr>
<td>Group A</td>
<td>Quarterly</td>
<td>Employees</td>
</tr>
<tr>
<td>Group B&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Annually</td>
<td>All occupants</td>
</tr>
<tr>
<td>Group B&lt;sup&gt;b,c&lt;/sup&gt; (ACF)</td>
<td>Annually</td>
<td>Employees</td>
</tr>
<tr>
<td>Group B&lt;sup&gt;b&lt;/sup&gt; (clinic, outpatient)</td>
<td>Annually</td>
<td>Employees</td>
</tr>
<tr>
<td>Group E</td>
<td>Monthly&lt;sup&gt;a&lt;/sup&gt;</td>
<td>All occupants</td>
</tr>
<tr>
<td>Group F</td>
<td>Annually</td>
<td>Employees</td>
</tr>
<tr>
<td>Group I-1</td>
<td>Semiannually on each shift</td>
<td>All occupants</td>
</tr>
<tr>
<td>Group I-2</td>
<td>Quarterly on each shift&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Employees</td>
</tr>
<tr>
<td>Group I-3</td>
<td>Quarterly on each shift&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Employees</td>
</tr>
<tr>
<td>Group I-4</td>
<td>Monthly on each shift&lt;sup&gt;a&lt;/sup&gt;</td>
<td>All occupants</td>
</tr>
<tr>
<td>Group R-1</td>
<td>Quarterly on each shift</td>
<td>Employees</td>
</tr>
<tr>
<td>Group R-2&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Four annually</td>
<td>All occupants</td>
</tr>
<tr>
<td>Group R-4</td>
<td>Semiannually on each shift&lt;sup&gt;a&lt;/sup&gt;</td>
<td>All occupants</td>
</tr>
</tbody>
</table>

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Table 405.2 – Fire and Evacuation Drill Frequency and Participation

2018 Fire Code Essentials
Part II
General Safety Requirements

1. T F  Open flame devices are prohibited in sleeping units of Group R-2 dormitories.

True
IFC §308.4.1

2. The fuel tanks in vehicles on display in a mall are limited to _______ gallons, or ______ capacity of the tank.

IFC §314.4
Part II
General Safety Requirements

3. A Fire Safety and Evacuation Plan is required in a Group F occupancy when the total occupant load in the building is \(500\) or more, or when there are \(100\) or more above or below the level of exit discharge.

4. In the above Group F occupancy, evacuation drills are required annually, and all employees must participate in the drill.
Site and Building Services
Fire Apparatus Access Roads
§503

- A fire apparatus access road is the road from the fire station to a facility, building or location
- Access road requirements are typically applied to private property
- Public roads are typically constructed to specifications developed by Public Works or Transportation Engineering department
Fire Apparatus Access Roads
§503.1

- Fire apparatus access roads are required for any facility, building or portion of a building constructed or moved into the jurisdiction
  - Located ≤150’ of all portions of the facility and the exterior walls of the 1st story of the building as measured by an approved route
Fire Apparatus Access Roads

§503

- Modifications to the 150’ distance
  - Sprinklers
  - Alternative protection because of topography limitations
  - ≤2 Group R-3 or U occupancies

Specified by jurisdiction

Minimum road height 13’6”

Maximum grade

Road surface

Inside turning radius

Outside turning radius

Approved turnaround required for dead-end roads >150’ in length

 ≤20’ wide

Security gates must meet ASTM F2200

Photo courtesy of Phoenix Fire Department
Phoenix, AZ
# Fire Apparatus Access Roads

## §503

- **Design and construction**
  - **Appendix D**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Chapter 5</th>
<th>Appendix D</th>
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<tbody>
<tr>
<td>Minimum road width</td>
<td>20’</td>
<td>20’; 26’ for aerial apparatus access</td>
</tr>
<tr>
<td>Maximum grade</td>
<td>As required by FCO</td>
<td>10%</td>
</tr>
<tr>
<td>Minimum turning radius</td>
<td>As required by FCO</td>
<td>As required by FCO</td>
</tr>
<tr>
<td>Turnaround design</td>
<td>Must be approved</td>
<td>Specific design criteria</td>
</tr>
<tr>
<td>Angle of approach/departure</td>
<td>As required by FCO</td>
<td>As required by FCO</td>
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<tr>
<td>Road surface</td>
<td>All weather</td>
<td>Asphalt, concrete or other approved surface</td>
</tr>
<tr>
<td>Road design</td>
<td>Support load of fire apparatus</td>
<td>Designed for vehicles with a weight of 75,000 pounds</td>
</tr>
<tr>
<td>Aerial apparatus access</td>
<td>Not specified</td>
<td>Buildings &gt;30’ in height</td>
</tr>
<tr>
<td>Fire lane signs</td>
<td>Must be approved</td>
<td>Minimum size, reflective background, specific design</td>
</tr>
<tr>
<td>Multiple access into subdivisions</td>
<td>When required by FCO</td>
<td>&gt;30 units unless sprinklered</td>
</tr>
</tbody>
</table>

Many of the specific dimensions can be included in Appendix D… *if* it is adopted.
Access to Buildings
§504

- Required exterior doors or openings must be maintained accessible for use by FD
  - Identification of riser rooms, electrical and mechanical rooms
- Key box – approved by the FCO
  - Location of the key box
  - Number of keys
  - Manufacturer of the key box
- Stairway to roof
  - Required when ≥4 stories
  - Stairway must be identified
Hazards to Firefighters
§504, §316

- Doors to shaftways must be marked
  - Interior doors
  - Exterior doors
- Security devices which could harm or injure FF are prohibited
- Trapdoors or scuttles must be closed when not in use
Fire Protection Water Supplies §507

- As part of construction, facilities or buildings require a fire water supply capable of delivering the required fire flow for manual fire-fighting operations

- Determining required water supply
  - Appendix B
    - IWUIC
    - NFPA 1142
  - Iowa State University
  - National Fire Academy
Water Supply

- Relationship of fire sprinkler requirements and fire-flow requirements are addressed in Appendix B
  - Both must be met
  - Do not combine
  - Water supply must be able to provide both, but not simultaneously

![Water Supply Curve Image]

<table>
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<th>Flow Test Data</th>
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<tr>
<td>Date</td>
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<tr>
<td>Static Pressure</td>
<td>65 PSI</td>
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<tr>
<td>Measured Flow</td>
<td>1425 GPM</td>
</tr>
<tr>
<td>Residual Pressure</td>
<td>34 PSI</td>
</tr>
</tbody>
</table>
Water Source
§507

- Tank, reservoir, pressurized water system
- Hydrant (or tank connection) within 400’ of the 1st floor exterior walls of the building
  - Sprinklered buildings ≤600’
  - Group R-3 and U ≤600’
  - Add hydrants
Water Source

- System must be tested and maintained
- NFPA 25
  - Annual flow test and maintenance of private fire hydrants
  - Flow test private fire protection water mains every 5 years
- Minimum 3’ clearance around hydrants
- Protection of hydrants required where subject to vehicle impact
Emergency Responder Radio Coverage

§510

- Emergency responder radio coverage provisions are concerned with the reliability of portable radios used inside buildings
- Requires that all buildings have approved radio coverage in 95% of the building
  - Digital audio quality is evaluated
  - DAQ 3.0
- If radio signals are not adequate, owner must install equipment to enhance signal
Emergency Responder Radio Coverage
§510

- IFC provides performance criteria for complying with radio coverage requirements
  - Does not specify solution, but allows use of any appropriate technology
- Secondary power required
- Testing and maintenance requirements
- Must meet FCC compliance
Fuel-Fired Appliances

§603

- Apparatus or device using fuel gas or fuel oil
- Equipment must be installed in accordance with manufacturer’s instructions
- Modifications must be in accordance with manufacturer’s requirements
- Access is required so equipment can be maintained

Waste oil is used as the fuel in these burners

Photo courtesy of Clean Burn Energy Systems
Leola, PA
Fuel Oil Inside Buildings
§603.3

- Aggregate fuel oil storage ≤660 gallons is allowed inside building in
  - Tanks allowed by Ch 57, or
  - Tanks integral to fuel burning equipment

<table>
<thead>
<tr>
<th>Gallons</th>
<th>Tank Listed To:</th>
<th>Additional Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤660 gallons</td>
<td>• UL 80, or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• UL 142, or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• UL 2085</td>
<td></td>
</tr>
<tr>
<td>&gt;660 and ≤1,320</td>
<td>• UL 142, or</td>
<td>Building is sprinklered with NFPA 13 system</td>
</tr>
<tr>
<td>gallons</td>
<td>• UL 2085 AND</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Building is sprinklered with NFPA 13 system</td>
<td></td>
</tr>
<tr>
<td>&gt;1,320 and ≤3,000</td>
<td>• UL 2085</td>
<td></td>
</tr>
<tr>
<td>gallons</td>
<td>• Building is sprinklered with NFPA 13 system</td>
<td></td>
</tr>
</tbody>
</table>
Fuel-fired Appliances *Inside* Buildings §603.4

- Portable unvented fuel-fired appliances inside buildings
  - Prohibited in Groups A, E, I and R
  - Listed and approved heaters allowed in 1- and 2-family dwellings
  - Cannot be located inside sleeping rooms, bathrooms or closets
Portable Gas-Fired Heaters *Outside* Buildings

- Portable outdoor heaters allowed in outdoor locations
- Listed to ANSI Z83.26 Standard for Gas-Fired Outdoor Infrared Patio Heaters
  - Requires CGA 790 gas valve

5’ separation to:
- Exits, or exit discharge
- Building wall
- Combustible decorations

Photo courtesy of Infrared Dynamics, Yorba Linda, CA
Mechanical Refrigeration §605

- IFC regulates refrigeration systems with
  - Toxic refrigerants
  - Ammonia
  - Flammable refrigerants
    - New – Class 2L
    - “Lower flammability”
    - Still treated as flammable
Elevators

§606

- Elevator required in new buildings with ≥4 stories above or below the LED
- Phase I and II required for all new elevators
- If elevators are ‘required’, then standby power is required
- If elevators are ‘required’, then 1 is sized for gurney
Commercial Kitchen Hoods
§607

- Commercial cooking appliances require a local exhaust ventilation system to remove heat, vapors, steam, smoke and odors
- Type I hoods are designed to also remove of grease-laden vapors and smoke
- Extinguishing system is required when Type I hood is required
# Commercial Hood Maintenance

## Table 607.3.3.1

<table>
<thead>
<tr>
<th>Type of Cooking Operation</th>
<th>Frequency of Inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-volume cooking operations such as 24-hour cooking, charbroiling, or wok cooking</td>
<td>3 months</td>
</tr>
<tr>
<td>Low-volume cooking operations such as places of religious worship, seasonal businesses, and senior centers</td>
<td>12 months</td>
</tr>
<tr>
<td>Cooking operations utilizing solid-fuel-burning cooking appliances</td>
<td>1 month</td>
</tr>
<tr>
<td>All other cooking operations</td>
<td>6 months</td>
</tr>
</tbody>
</table>

System is cleaned when inspection finds excess grease.

*Courtesy of Flue Steam, Inc., Culver City, CA*
Commercial Kitchen Cooking Oil Storage
§608

- Storage of cooking oil in commercial cooking operations shall comply with Ch 57.

- Systems storing cooking oils in >60 gallon above-ground tanks requires UL 142 or UL 80 listed aboveground storage tank.

- Each tank to have a normal and emergency vent.

- Nonmetallic tanks can be listed without emergency vent.

Courtesy of Darling International Inc., Irving, TX

Nonmetallic tanks ≤200 gallons

Courtesy of Restaurant Technologies, Inc., Mendota Heights, MN
Discussion Activity
Final Reflection

Reflect on the day. What will you take back to the job and apply?

- **What?** What happened and what was observed in the training?
- **So what?** What did you learn? What difference did this training make?
- **Now what?** How will you do things differently back on the job as a result of this training?
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