Test Your Code Knowledge

An Interactive Q&A Discussion of Regulatory Codes

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Lennon Peake, P.E. SASHE
INTRODUCTIONS

William E. Koffel, P.E., FSFPE
- President of Koffel Associates, Inc.
- Serves on numerous NFPA technical committees
- 30+ years industry experience

Lennon Peake, P.E., SASHE
- Director at Koffel Associates, Inc.
- NFPA technical committees and ASHE involvement (local & national)
- 15+ years industry experience
THE “TEST” SYSTEM

- Question displayed
- Use clicker to select response
- Further discussion and explanation based on percentage of correct responses
POLLING DEVICE

- Press any key to turn on device
- Confirm channel is 41
- When instructed to do so, select appropriate black letter key
QUESTION CATEGORIES

- The Joint Commission (TJC) 2017 citation data
- International Building Code
- NFPA 101®
- Reference Standards
  - NFPA 13, NFPA 25, NFPA 72, NFPA 80, NFPA 105
NFPA 101 2021 CHANGES?

- Deadline to submit Public Input (PI)
  - June 27, 2018
  - Do not have to be an NFPA member to submit PI
  - Applicable committee will review and consider PIs submitted
- Any ideas?
  - Need assistance?
Who will win the 2018 World Series?

A. Yankees
B. Red Sox
C. Astros
D. Dodgers

According to the diagram:
- Yankees: 14%
- Red Sox: 65%
- Astros: 14%
- Dodgers: 8%
TJC 2017 Citations

What was the most common TJC 2017 citation?

A. Penetrations
B. Ligature Risk
C. Items supported by sprinkler piping
D. Open electrical junction boxes
MOST COMMON TJC 2017 CITATION

Answer - B Ligature Risk

- CMS S&C Letter 18-06-Hospitals
  - CMS is drafting comprehensive ligature risk interpretive guidance
    - Due in a few months
  - Psych patients receiving care in a non-psych setting must be protected when demonstrating suicidal ideation
    - Medical inpatient units, EDs, ICUs, etc.
- 60 days to remediate cited conditions
TJC 2017 TOP 5 CITATIONS

Which standard was not in the TJC 2017 top 5 citations?

A. LS.02.01.35 - Fire Extinguishing System ITM
B. LS.02.01.30 - Protect from Smoke and Fire
C. EC.02.05.01 - Manage Utility System Risk
D. EC.02.05.05 - Utility System ITM
TJC 2017 TOP CITATIONS

► Answer - D EC.02.05.05 - Utility System ITM
  ►  #8 on list of top citations
  ►  52% non-compliant - EP 6 ITM of non-high risk utility equipment

► #1 LS.02.01.35 - Fire Extinguishing System ITM
  ►  59% non-compliant - EP 4 Sprinkler piping supports and escutcheon plates

► #2 EC.02.05.01 - Manage Utility System Risk
  ►  45% non-compliant - EP 8 Utility system emergency shutdown labeling

► #4 LS.02.01.30 - Protect from Smoke and Fire
  ►  38% non-compliant - EP 3 Hazardous area enclosures (barrier and door)
TJC 2017 LARGEST CITATION INCREASE

Which TJC 2017 top 10 citation increased by the biggest percentage over 2016?

A. LS.02.01.35 - Fire Extinguishing System ITM
B. LS.02.01.30 - Protect from Smoke and Fire
C. EC.02.05.01 - Manage Utility System Risk
D. EC.02.05.05 - Utility System ITM
LARGEST 2017 TJC CITATION INCREASE

- Answer - D EC.02.05.05 - Utility System ITM
  - Increase of 44%
  - Utility System Inventory
    - EP 6 non-high risk 52% facilities cited

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5-LB FORCE

What type of door is permitted to meet a 5-lb force requirement in lieu of positive latching?

A. Hazardous area door
B. Power operated corridor doors
C. Smoke barrier door
D. Door provided with a locking arrangement
5-LB FORCE

Answer B - Power operated corridor doors

- Effective March 11, 2018
- 5-lb force option requires the Authority Having Jurisdiction (AHJ) approval
- Positive latching is required unless the organization can verify that latching equipment is not an option provided by the door manufacturer
- Door must remain closed upon application of a 5-lb force whether or not power is applied to the door
NFPA 13, 2010 EDITION
QUICK-RESPONSE SPRINKLERS

A renovation occurs in a hospital. Quick-response sprinklers are installed. Are the sprinklers in the entire smoke zone required to be replaced?

A. Yes
B. No
C. Only sprinklers in the same compartment as the quick-response sprinklers

- A: 24%
- B: 11%
- C: 65%
QUICK-RESPONSE SPRINKLERS

Answer C - Only sprinklers in the same compartment as the quick-response sprinklers

- NFPA 13 2010 §8.3.3.2

- Smoke zone vs. smoke compartment
- Defines a compartment as “A space enclosed by walls and a ceiling”
  - Openings for permitted depending on dimensions
- Future HITF interpretation?
SPRINKLER SUPPORTS

Sprinkler piping installed below ducts must be supported by?

A. Building structure
B. Duct supports
C. All of the above

86% 3% 11%
SPRINKLER SUPPORTS

Answer C - All of the above

- NFPA 13 2010 §9.2.1.5

- Duct supports must be capable of supporting ductwork and weight of water-filled pipe + 250 lbs.
SMOKE ALARMS

What is the maximum amount of time a single/multiple station smoke alarm may remain in service?

A. 10 years
B. 15 years
C. 20 years
D. No maximum time
SMOKE ALARMS

Answer A - 10 years

- NFPA 72 2010 §14.4.8.1

- From the date of manufacture
  - Unless otherwise recommended by the manufacturer’s published instructions
- Check smoke alarms in your home
SMOKE DOOR ASSEMBLY INSPECTION

A door required to comply with NFPA 105 is required to be inspected at what interval?

A. Quarterly
B. Semi-annually
C. Annually
D. No requirement
SMOKE DOOR ASSEMBLY INSPECTION

Answer C - Annually

- NFPA 105 2010 §5.2.1.1

- Existing smoke barrier doors in hospitals likely are not considered smoke door assemblies
  - Door assembly that restricts movement through door openings by limiting the amount of air that can pass through the assembly
NFPA 25, 2011 EDITION
SPARE SPRINKLERS

How many spare sprinklers for a system with 200 sprinklers are required to be maintained in a cabinet?

A. 3 sprinklers
B. 6 sprinklers
C. 10 sprinklers
D. 24 sprinklers
SPARE SPRINKLERS

Answer B - 6 sprinklers

- NFPA 25 2011 §5.4.1.5

- Minimum of 6 corresponding to the types and temperature ratings of installed sprinklers
  - < 300 sprinklers - 6 spare sprinklers
  - 300 - 1,000 sprinklers - 12 spare sprinklers
  - > 1,000 sprinklers - 24 spare sprinklers

- Do not forget the spare wrench!
SPRINKLER LIFE CYCLE

How long is a standard response sprinkler permitted to remain in service before it must be replaced or tested?

A. 20 years
B. 35 years
C. 50 years
D. No requirement
SPRINKLER LIFE CYCLE

Answer C - 50 years

- NFPA 25 2011 §5.3.1.1.1
- Must be replaced or representative sample from one or more sampling areas tested
- Testing at 10 year intervals
- Manufactured prior to 1920 must be replaced
- Quick-response sprinklers testing at 20 years intervals
ANTIFREEZE SPRINKLER SYSTEM SOLUTION

Under certain circumstances, antifreeze systems installed prior to 2012 will not require a listed antifreeze solution until what year?

A. 2017
B. 2022
C. 2027
D. Listed solution will not be required
ANTIFREEZE SPRINKLER SYSTEM SOLUTION

Answer B - 2022

- NFPA 25 2014 §5.3.4.2.1

- Newly introduced solutions must be factory pre-mixed
- Limitations on volume % of glycol and glycerin
  - Modified percentages permitted upon risk assessment
MAIN DRAIN TEST

What is the purpose of a main drain test?

A. Verify adequacy of water supply
B. Ensure inspector test drains are operable
C. Verify adequacy of fire pump room drain
D. All of the above
MAIN DRAIN TEST

Answer A - Verify adequacy of water supply

- Benchmark test to be compared to previous year and original test
- Annual test, quarterly if sole FP water supply through backflow preventer or RPV
- Do not forget to document comparison between test
- NFPA 25 2011 §A.13.2.5 contains a recommended main drain test procedure
  1. Record the pressure indicated by the supply water gauge.
  2. Close the alarm control valve on alarm valves.
  3. Fully open the main drain valve.
  4. After the flow has stabilized, record the residual (flowing) pressure indicated by the water supply gauge.
  5. Close the main drain valve slowly.
  6. Record the time taken for the supply water pressure to return to the original static (nonflowing) pressure.
  7. Open the alarm control valve.
MAIN DRAIN TEST

What percent reduction of full flow pressure when compared to original acceptance test OR previously performed tests requires investigation to determine cause of reduction?

A. 5 percent
B. 10 percent
C. 20 percent
D. No requirement
MAIN DRAIN TEST

Answer B - 10 percent

- NFPA 25 2011 §13.2.5.2

- When compared to the original acceptance test or previously performed tests
  - 10% reduction in full flow pressure
    - The cause of reduction must be identified and corrected if necessary
STANDPIPE FLOW TEST

A flow test is required to be conducted every 5 years at the hydraulically most remote hose connection(s) for what type(s) or class(es) of standpipes?

A. Manual-wet
B. Class I and Class III
C. Automatic-wet
D. Not required
Answer C - Automatic-wet

NFPA 25 2011 § 6.3.1.1

- Verify design criteria of standpipe
- Is your system manual or automatic?
- Manual standpipe does not provide automatically provide pressure
  - Fire department pumper truck provides pressure
INTERNATIONAL BUILDING CODE
DELAYED EGRESS LOCKING

What is the maximum number of delayed egress locks permitted in any egress path in a Group I-2 and Group I-3 occupancy?

A. 1
B. 2
C. 3
D. No limitation
DELAYED EGRESS LOCKING

Answer B - 2 locks

- IBC 2015 1010.1.9.7.5

- The combined delay of the two doors must not exceed 30s
- LSC no longer limits number of doors
- Building requires complete sprinkler protection or smoke/heat detection
ACCESS CONTROLLED EGRESS DOORS

Doors equipped with access controlled locking require which of the following features?

A. Manual release device (push to exit button) AND motion sensor to release locking mechanism
B. Appropriate signage on the door
C. Two-way communication with security from within locked space
ACCESS CONTROLLED EGRESS DOORS

Answer A - Manual release device (push to exit button) AND motion sensor to release locking mechanism.

- IBC 2015 1010.1.9.8

- Manual release device is a redundant feature
  - Installed within 5 ft of door
- Locking arrangement applicable to doors that are only required for egress from one side
A fuel oil pipe is permitted to penetrate a fire-rated exit enclosure if it is separated from the exit enclosure by 2-hour construction?

A. True
B. False
PENETRATION OF EXIT ENCLOSURES

Answer B - False

IBC 2015, 1023.5

Penetrations into and through exit are prohibited except for the following:

- Standpipe, sprinkler piping
- Electrical raceways
  - Serving stair enclosure
  - Serving fire department communication systems
- Stair pressurization equipment
NUMBER OF DOORS IN SUITE EGRESS PATH

What is the maximum number of doors permitted in an egress path prior to exiting a Care Suite?

A. 1
B. 2
C. 3
D. Unlimited
NUMBER OF DOORS IN SUITE EGRESS PATH

Answer C - 3 doors

- IBC 2015 407.4.4.3
- LSC does not limit the number of doors
- Navigation through doorways slow emergency response of relocating patients
NFPA 101®, LIFE SAFETY CODE®, 2012 EDITION
SUITE TRAVEL DISTANCE

The 100 ft maximum allowable suite travel distance must be measured from any point in the suite to which location?

A. Smoke barrier door
B. Exit access door
C. Exit stair door
D. All of the above
SUITE TRAVEL DISTANCE

Answer B - Exit Access Door

- LSC 2012 §18/19.2.5.7.2.4(A) and 18/19.2.5.7.3.4(A)

- Second means of egress permitted to another suite, exit stair/passageway, exterior exit

- LSC 2015
  - suite travel distance can be measured to a horizontal exit or door to another suite
  - “exit access door” replaced with “exit access corridor door”
FIRE FIGHTERS’ EMERGENCY OPERATION

Which existing elevator is required to be provided with fire fighters’ emergency operations?

A. Elevator serving 2 floors
B. Elevator serving 3 floors
C. Elevator with vertical travel 35 ft from primary recall floor
D. Elevator with vertical travel 25 ft from primary recall floor

A. 15%
B. 31%
C. 35%
D. 19%
Answer D - Elevator with vertical travel 25 ft from primary recall floor

- **LSC 2012 §9.4.3.2**

- **LSC language references 25 ft of travel above or below the level that best serves the needs of emergency personnel for fire-fighting or rescue purposes**
ELEVATOR TESTING

How often must elevators verify the operability of the fire fighters’ emergency operation feature?

A. Weekly
B. Monthly
C. Semi-annually
D. Annually
ELEVATOR TESTING

Answer B - Monthly

- LSC 2012 §9.4.6.2

- TJC HAS EC.02.03.05 EP 27
  - ASHE crosswalk update to 2018 standards
  - Written records required to be kept on premises
The elevation of the floor surfaces on both sides of a door opening in a means of egress must not vary by more than what dimension?

A. No variation permitted
B. ¼-inch
C. ½-inch
D. ¾-inch
FLOOR LEVEL

Answer C - ½-inch

- **LSC 2012 §7.2.1.3.1**

- Elevation must be maintained for distance not less than width of widest door leaf

- Existing door openings discharging to exterior
  - Floor level outside door opening permitted to be one step lower than inside
  - No more than 8-inches lower

- Existing doors at top of stairs
  - Permitted to open directly at stair provided door does not swing over stair and serves occupant load of < 50 people

- **LSC 2015 permits an 8-inch step for spaces that are not normally occupied**
NORMALLY UNOCCUPIED ROOMS

Which provision below is required to allow an existing mechanical equipment room to open directly onto an exit enclosure?

A. Space contains no fuel-fired equipment
B. Space contains no storage of combustible materials
C. Building is completely sprinkler protected
D. All of the above
NORMALLY UNOCCUPIED ROOMS

Answer D - All of the above

- **LSC 2012 §7.1.3.2.1(9)(c)**
- Opening must also be protected by properly rated door assembly
- **LSC 2018 permits the mechanical space to be provided with sprinkler protection AND smoke/heat detection in lieu of complete building sprinkler protection**
AMBULATORY HEALTH CARE SEPARATION

Ambulatory health care facilities are required to be separated from other tenants and business occupancies which of the following?

A. Walls with a 1-hour fire-resistance rating
B. Walls with a 2-hour fire-resistance rating
C. Floor slabs with a 1-hour fire-resistance rating
D. None of the above
AMBULATORY HEALTH CARE SEPARATION

Answer A - Walls with a 1-hour fire-resistance rating

- LSC 2012 §20-21.3.7

- 1-3/4 inch solid-bonded wood core door self-closing and positive latching
- Any windows required to be fixed fire window assembly
- LSC 2015 Handbook states floor slabs are not required to have a fire-resistance rated separation
  - Local building code may require rated floor slab and supporting construction
CAMERAS IN EXIT ENCLOSURES

Cameras are specifically permitted to be installed in exit enclosures?

A. True
B. False

54% 46%
CAMERAS IN EXIT ENCLOSURES

Answer B - False

- **LSC 2012 §7.1.3.2.1(10)**
  - (b) electrical conduit serving exit enclosure
    - Annex note - .....penetrations for electrical wiring are permitted where approved by the AHJ for to be located in exit enclosure for items such as security systems, public address systems and fire department emergency communication systems
  - (h) existing penetrations protected per §8.3.5

- **LSC 2018 edition permits “Pathways for devices for security and communication systems serving the exit enclosure where pathways are installed in metal conduit”**
PATIENT ROOM CONVERSION TO STORAGE

When a patient room in an existing health care occupancy is converted to a storage room (less than 250 ft$^2$) it is classified as:

A. Renovation
B. Modification
C. Reconstruction
D. Change of use
PATIENT ROOM CONVERSION TO STORAGE

Answer - D Change of use

- LSC 2012 §43.7.1.2(2)

- New construction requirements do not apply
  - 250 sq ft limitation
  - Sprinkler protection required
  - Enclosure in smoke partition in lieu of fire-resistance rated barrier
  - Self-closing or automatic closing doors
REHABILITATION CATEGORY OF WORK

Replacement of existing materials with new materials is what classification of work?

A. Renovation
B. Repair
C. Modification
REHABILITATION CATEGORY OF WORK

Answer B - Repair

- LSC 2012 §43.2.2.1

- **Repair** - The patching, restoration or painting of materials, elements, equipment, or fixtures to maintain in good condition
  - Lowest category of work
BUILDING REHABILITATION

Which order below of category of rehabilitation work is from the least extent to the greatest extent of work?

A. Repair, Modification, Renovation, Reconstruction
B. Repair, Renovation, Modification, Reconstruction
C. Renovation, Repair, Modification, Reconstruction
BUILDING REHABILITATION

Answer - B

- **Repair** - The patching, restoration or painting of materials, elements, equipment, or fixtures to maintain in good condition
- **Renovation** - The replacement in kind, strengthening, or upgrading of building elements, materials, equipment or fixture without reconfiguration
- **Modification** - Space reconfiguration, window/door relocation, eliminating load bearing elements; reconfiguring or adding of systems/equipment
- **Reconstruction** - Reconfiguring of egress arrangement or taking fire protection system out of service
REHABILITATION CATEGORY OF WORK

Changing patient sleeping rooms to sleeping rooms for family members is what category of work?

A. Change of Occupancy Classification to a lower hazard
B. Change of Occupancy Classification to a higher hazard
C. Reconstruction
REHABILITATION CATEGORY OF WORK

Answer A - Change of Occupancy Classification to a lower hazard

- **LSC 2012 §43.2.2.1.6**

- **Change of occupancy classification** - The change in the occupancy classification of a structure or portion of a structure

- **LSC 2012 Table 43.7.3 Hazard Categories and Classifications**
  - Health care - Hazard Category 2
  - Residential - Hazard Category 3
    - Lower the number, higher the hazard
In an existing hospital, how many means of egress are required from an outdoor medical gas storage area?

A. 1
B. 2
OUTDOOR MEDICAL GAS STORAGE AREAS

Answer - you are right depending on who you ask
  ► NFPA committee reviewed Formal Interpretation and did not agree on requirement

  ► NFPA 99 2012 §5.1.3.3.2(3) requires two exits
    ► NFPA 99 2012 §5.1.1.5(4) does not require compliance for existing buildings

  ► NFPA 99 2012 §5.1.3.3.4.1 is required to comply in existing buildings which requires compliance with §5.1.3.3.2

  unintended reference?
ELECTRICAL BRANCHES

Which of the following is not a type of electrical branch required for an essential electrical system – Type 1?

A. Equipment branch
B. Life safety branch
C. Auxiliary branch
D. Critical branch
ELECTRICAL BRANCHES

Answer C - Auxiliary branch

- NFPA 99 2012 §6.4.2.2.1.1
MEDICAL GAS MANIFOLD ROOM

Which of the following is required in an indoor oxygen manifold room?

A. Sprinkler protection
B. Smoke detector
C. 1-hour enclosure
D. All of the above
MEDICAL GAS MANIFOLD ROOM

Answer C - 1-hour enclosure

- NFPA 99 2012 §5.1.3.3.2(4)
MEDICAL GAS STORAGE ROOM EXHAUST

An existing medical gas storage room storage with greater than 3,000 ft³ of medical gas requires an exhaust inlet within 12 inches of the floor?

A. True
B. False
MEDICAL GAS STORAGE ROOM EXHAUST

Answer B - False

- NFPA 99 2012 §5.1.3.3.3 and 9.3.7.5.3.3
- Chapter 5 requires an exhaust
- Chapter 9 contains 12 inch requirement
  - Does not apply to existing construction unless a distinct hazard to life is posed
FIRE EXTINGUISHERS IN OPERATING ROOMS

What type of fire extinguisher is permitted in an operating room?

A. Clean agent extinguisher
B. Water mist extinguisher
C. Carbon dioxide extinguisher
D. All of the above
FIRE EXTINGUISHERS IN OPERATING ROOMS

Answer D - All of the above

- NFPA 99 2018 §16.9.1.3

- Code requires Clean-agent or water mist type fire extinguishers
- NFPA 10 Clean Agent Definition
  - “Electrically non-conducting, volatile, or gaseous fire extinguishant that does not leave a residue upon evaporation.”
  - Carbon dioxide extinguishers meet definition of clean agent
- Class A rating concern
THANK YOU

PLEASE RETURN

ALL POLLING DEVICES
Questions?

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