

# Life Safety Code

## Handout Materials

### Contents

- Suggested Preparation for Life Safety Code Survey
- Nursing Home Life Safety Code Entrance Conference Documentation Checklist \*
- State Operations Manual – Appendix I—Survey procedures and Interpretive Guidelines for Life Safety Code Surveys – Excerpt: Task 4-Information Gathering\*\*
- Life Safety Code Waiver Request Form \*
- Top Ten Deficiencies and Helpful Hints to avoid Them (CMS-Region V, FY 2011) \*
- 2012 Listing of Most Frequently Cited Deficiencies in Indiana
- “So that’s what they look for! An inside look into Form CMS-2786R” CMS-Region V, January, 2010 \*
- NFPA Journal Article, “Long Time Coming” January/February 2013

\*\*Note that the entire State Operations Manual – Appendix I-is included on the Indiana State Department of Health Life Safety Code website:

<http://www.in.gov/isdh/24685.htm>

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## Suggested Preparation for Life Safety Code

- Have a set of Building Plans; Life Safety Code Blueprints; Floor Plans showing fire and smoke separations
  
- Provide the documentation listed on (Handout) Entrance Conference Documentation Checklist in a readily available format. Electronic media is allowed but still needs to be readily available.
  
- Have information related to the construction of the facility and/or additions.
  - Dates of Construction
  - Design Releases
  - Construction Types
  
- Fire Stop Materials Documentation
  
- Have Facilities Engineer, Maintenance Director available





## Nursing Home Life Safety Code Entrance Conference Documentation Checklist

Indiana State Department of Health-Division of Long Term Care

1. Floor plan of facility
2. Interior Finish Flame Spread Ratings for wallpaper, paneling, etc.
3. Fire Drills and Evidence of Activation of the Fire Alarm System
4. Annual Fire Alarm Testing and Maintenance
5. Smoke Detector Sensitivity Testing
6. Automatic Sprinkler System-Annual and Quarterly Inspection and Testing including 5 year Internal Inspection and Annual Private Hydrant Testing
7. Kitchen Range Hood Exhaust Cleaning & Inspection
8. Kitchen Extinguishing System Inspection
9. Weekly Generator Inspection & Monthly Generator Load Test or Annual Load Bank Test
10. Battery-operated Emergency Lighting Monthly & Annual Inspection & Testing
11. Drapery, Curtain, Hanging Fabric, Flame Retardancy Documentation
12. Fire Extinguisher Annual, Monthly and Six-year Maintenance & Inspection
13. Fire Damper Testing
14. Boiler/Water Heater Inspections
15. Smoking Policy
16. Fire & Disaster Plan & Procedure
17. Fire Watch Plan & Procedure
18. Policy on Admission of Residents who require Life Support
19. Policies regarding Oxygen Transfilling, Power Strips, Portable Heaters and Generator malfunction
20. Annual Rolling Fire Door Test and Inspection



# State Operations Manual

## Appendix I – Survey Procedures and Interpretive Guidelines for Life Safety Code Surveys - (Rev. 1, 05-21-04)

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### Part I - Survey Procedures for Life Safety Code Surveys

#### I. Introduction

#### II. The Survey Tasks

Task 1 – Offsite Survey Preparation

Task 2 - Entrance Conference/Onsite Preparatory Activities

Task 3 - Orientation Tour

Task 4 - Information Gathering

Task 5 - Information Analysis and Decision Making

Task 6 - Exit Conference

#### III. Complaint Investigations

#### IV. Post Survey Revisits

Small facilities are those with sleeping accommodations for not more than 16 residents (section 32.2 or 33.2). Large facilities are facilities with sleeping accommodations for more than 16 residents (section 32.3 or 33.3). This means that an apartment building containing several ICFs/MR in separate apartments must meet Section 32.2 or 33.2 for the individual units, and the apartment building must meet the requirements of Chapter 30/31 Apartment Buildings which are listed in section 32.4 or 33.4.

Most large facilities tend to fall into the category of health care, while smaller facilities tend to be residential board and care occupancies.

### **Task 3 - Orientation Tour**

An orientation tour may be in order to provide an overview of the facility, and serve as an introduction of the surveyors to the staff. This may be helpful if the facility is a very large single building or has multiple buildings that may have to be surveyed.

### **Task 4 - Information Gathering**

Upon completion of the review of the documentation provided by the facility, the more detailed inspection begins. Using the layout of the building as a guide, begin an observation tour that includes the outside of the building as well as the inside.

At this time determine the type of building construction. This can be accomplished by review of the construction drawings, if available, and must be confirmed by direct observation of the structure and building materials used in constructing the building (exposed areas above the ceilings or vertical pipe shafts may provide insight).

Check floor-to-floor separations, corridor wall construction, smoke barrier locations, construction and condition, and any vertical opening construction including access doors. If multiple buildings or wings are involved, any fire barriers present should be inspected for construction materials used, the protection of penetrations through the barriers and the type and arrangement of any doors thru the barriers. Buildings separated by a vertical two-hour fire barrier can be considered separate buildings for the purposes of a Life Safety survey. (Note: If the two-hour fire barrier has been so severely compromised by penetrations or other construction defects that it may not provide the required fire protection, it may be necessary to ignore this feature and consider combining the two buildings together. If this is done, the two buildings will be surveyed as if there were only one building. The facility may elect to repair the two-hour separation and have the buildings surveyed as two separate buildings.)

When separate buildings are surveyed, each building requires the use of an individual set of reporting forms.

Proceed next to a complete room-by-room, floor-by-floor, walk through of the facility. This includes a representative sample of bedrooms (Table 1). At a minimum, inspect: one smoke barrier, including doors, on each floor or wing; all fire barriers; all hazardous



areas including doors into the area; all exit stairs, doors, signs; resident room doors for condition, latching and fit in the door frame; the fire alarm system; the sprinkler system; the emergency power generator set; corridor walls; emergency lighting; and medical gas storage, if applicable.

Inspect the smoke and fire barriers for construction materials and continuity, completeness from outside wall to outside wall and from the floor to the bottom of the floor above where applicable. Inspect any penetrations to determine if they are sealed properly. Where ductwork penetrates the barrier, inspect any dampers, fire or smoke that have been installed in the ductwork.

For each room inspected, check the corridor door for latching, operation and fit into the doorframe. The fire rating of the door should also be inspected if applicable. The interior of the room should then be inspected for hazards such as electrical outlets, extension cords, oxygen in use signs (posted where applicable), and portable space heaters.

Wastebasket size, drapes and cubicle curtains are checked for flammability. Where applicable cubicle curtains are checked for the correct mesh opening size. If the facility is sprinklered, the location of the sprinkler head in relation to the cubicle curtain and walls are checked for obstruction or interference to the water spray pattern. The walls and ceilings are inspected for unsealed penetrations and proper construction.

Inspect the corridor walls and ceilings for proper construction. This inspection should include areas above the ceiling.

Inspect all hazardous areas for proper door type and, where applicable, sprinkler installation or fire separation construction.

Note the maintenance of fire extinguishers and exit signs on an ongoing basis throughout the inspection.

Inspect the fire alarm pull stations and alarm devices while moving along the corridors. Similarly, review smoke detectors where they are required or provided.

Note any corridor obstructions and the distances to exits. At the same time the exitways, including the doors and door hardware are inspected, as well as the exitway lighting and exterior walkways.

Inspect the fire alarm control panel noting any areas/zones not covered by the detection system. Inspection tags or labels should be reviewed. Any system trouble lights should be noted and the facility questioned. Determine if the fire alarm system is connected to the fire department or a remote station outside of the facility.

Review sprinkler systems to determine if the system is providing complete coverage or only partial coverage. Complete coverage means that the entire facility, including all

closets, storage areas, and walk-in coolers and freezers, is sprinklered. Proper testing and maintenance records must be maintained by the facility. The connection between the sprinkler system and fire alarm system should be confirmed. Tamper switches and waterflow detection devices must be operational.

Inspect the facility kitchen range hood fire extinguisher system to determine if the proper maintenance of the system is being carried out and the activating mechanism is in a clearly marked location. The staff should be questioned regarding the operation of any fire suppression systems in an emergency.

Inspect the emergency lighting or power system for operability and coverage, including on-site generators. Review records of testing and maintenance of the generator(s). A demonstration of the emergency power system should not be requested due to the large amount of computerization and the use of life support equipment that may be affected.

Inspect laboratories for proper sprinklering, fire separation construction, door type, emergency eye wash equipment, storage of flammable liquids and gases, and fume hood ventilation.

Inspect medical gas storage areas for proper construction, ventilation, gas system controls/alarms and proper restraint of cylinders.

Review the facility fire plan including fire drill records and staff interviews to determine staff actions and responsibilities during a fire or emergency. The surveyor may request an actual fire drill demonstration based on a review of the facility fire drill records and interviews with the staff to verify the adequacy of staff response. This should be done only if there is a question of the adequacy of staff response found in the documentation of the monthly fire drills.



**LIFE SAFETY CODE WAIVER REQUEST**

Slate Form 54147 (11-09)  
Indiana State Department of Health-Division of Long Term Care.

**INSTRUCTIONS:** Use this form for Annual or Temporary Waiver Requests of a K-tag cited on the Life Safety Code survey. Submit the completed form, along with all supporting documentation, with the Plan of Correction. Please use one form for each K-tag, or portion of a K-tag, for which a waiver is being requested.

ANNUAL (CONTINUING) WAIVER: Specific life safety code requirements may be waived if the noncompliance cannot be corrected without an unreasonable financial hardship on the facility and it does not pose a threat to residents' health and safety.

TEMPORARY WAIVER: A Temporary Waiver for a defined time period may be considered for noncompliance with a specific life safety code requirement for which corrective action will take more than ninety (90) days to complete. The documentation submitted by the facility for approval of a temporary waiver must include a timetable to correct the deficiency and steps the facility has taken to increase fire safety awareness while noncompliance is being corrected.

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Facility Name: \_\_\_\_\_ Provider Number: \_\_\_\_\_

Address (number and street, city, state, and ZIP code): \_\_\_\_\_

Contact Name: \_\_\_\_\_ Title: \_\_\_\_\_

Telephone Number: \_\_\_\_\_ Email: \_\_\_\_\_

LSC Survey Date (month, day, year): \_\_\_\_\_ K-tag: \_\_\_\_\_

Check One:  Annual  Temporary End Date (month, day, year): \_\_\_\_\_

**ANNUAL (CONTINUING) WAIVER JUSTIFICATION**

1. Evidence the deficiency does not pose a threat to resident health or safety:  
(Attach additional sheets or documentation as applicable.)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Evidence of how correction poses an unreasonable financial hardship to the facility:  
(Attach additional sheets, estimates, cost reports, or other documentation as applicable to support claim of hardship.)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**TEMPORARY WAIVER JUSTIFICATION**

1. Evidence the deficiency does not pose a threat to resident health or safety:  
(Attach additional sheets or documentation as applicable.)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Evidence of why correction cannot be completed in ninety (90) days from date of survey:  
(Attach additional sheets, estimates, contracts, or other documentation.)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. Describe timetable for completion of correction. Include milestones and evidence to be provided to the ISDH Life Safety Code Supervisor to show progress toward completion:  
 (Attach additional sheets or documentation as applicable.)

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4. Describe evidence of correction/completion that will be submitted to the ISDH Life Safety Code Supervisor within fifteen (15) days of end date:

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**ADDITIONAL SAFETY MEASURES TO COMPENSATE FOR DEFICIENCY:**

(Check those implemented and attach details.)

<input type="checkbox"/> 1. Additional Fire Extinguishers	<input type="checkbox"/> 10. Additional fire drills
<input type="checkbox"/> 2. Additional Smoke Detection	<input type="checkbox"/> 11. Fire Watch (rounds every 15 minutes)
<input type="checkbox"/> 3. Additional sprinklers/water curtain	<input type="checkbox"/> 12. Safety rounds— specify frequency
<input type="checkbox"/> 4. Infrared inspection of motors and electrical panels	<input type="checkbox"/> 13. HVAC shut down tied to fire alarm
<input type="checkbox"/> 5. Additional inspections	<input type="checkbox"/> 14. Practical and/or competency skills testing
<input type="checkbox"/> 6. Local fire department: monthly inspections	<input type="checkbox"/> 15. Hands-on fire extinguisher training
<input type="checkbox"/> 7. Local fire department: quarterly inspections	<input type="checkbox"/> 16. Emergency procedure training
<input type="checkbox"/> 8. Local fire department: review of emergency plans	<input type="checkbox"/> 17. Install additional/horizontal exit
<input type="checkbox"/> 9. Additional maintenance	<input type="checkbox"/> 18. Hire structural/electrical/fire protection engineering firm to develop plan of action.
<input type="checkbox"/> Other:	<input type="checkbox"/> Other:

Administrator (Signature)	Title	Date (month, day, year)
Corporate Office (Signature)	Title	Date (month, day, year)

**FOR ISDH USE**

Date Annual Waiver Sent to CMS (month, day, year): \_\_\_\_\_ Date Approval from CMS (month, day, year): \_\_\_\_\_

Date Denial from CMS (month, day, year): \_\_\_\_\_ Date Facility Contacted (month, day, year): \_\_\_\_\_

Action Plan: \_\_\_\_\_

Date Temporary Waiver Approved (month, day, year): \_\_\_\_\_ By: \_\_\_\_\_

Contact: Dennis Austill, Life Safety Code Supervisor  
 Indiana State Department of Health  
 2 North Meridian Street  
 Indianapolis, IN 46204

Telephone: 317-233-7471  
 Fax: 317-233-7322  
 Email: [Daustill@isdh.in.gov](mailto:Daustill@isdh.in.gov)

Information of interest from the CMS Region V meeting held December 12 & 13, 2011 in Chicago.

A Life Safety Code update was given by Steve Pelinski, Bruce Wexelberg and Dan Kristola. The following information was shared and discussed regarding Federal K tags for Life Safety Codes:

A top ten deficiencies and helpful hints to avoid them were presented and are as follows:

### Top Ten Deficiencies and Helpful Hints to Avoid Them

(Deficiency numbers for Region V from FY11)

#### K29-Hazardous Areas

- Doors for nonsprinklered hazardous areas must be at least 45min fire resistance rated (there should be 3 unpainted labels on each door) (Existing HC)
- Hazardous area enclosure may need to be 1hr fire resistance rated in addition to required sprinkler protection (New HC and severe hazard existing HC)
- Doors for all hazardous areas need to fully self-close (All hazardous room doors will be tested on a survey)
- Soiled utility bins need to be stored in a hazardous room when unattended
- Doors can only be held open by a device that releases upon activation of the fire alarm system, local smoke detectors, and /or the sprinkler system

Other topics discussed with K29 tag:

1. The use of unoccupied resident rooms for storage becomes a hazardous area due to the lack of safety features recommended for storage areas.

#### K62- Sprinkler System Inspection, Testing and Maintenance

- Sprinklers cannot be painted, corroded/oxidized, laded or have other impediment
- The spare sprinkler cabinet must contain at least six sprinklers, with the stock being at least two of each type and temperature rating of sprinkler installed in the building. Also there must be special sprinkler wrench for each type of sprinkler

Other topics discussed with K62 tag:

1. Sprinklers must be inspected every quarter (90 days or calendar quarter)
2. No caps on sprinkler heads

#### K144 -Emergency Generators

- Weekly visual inspections must be conducted and documented (Manufacturer's recommendations list or list of applicable items from NFPA 110 Appendix A)

- Monthly load test must be done for a minimum of 30 minutes under load (cool down without load must be outside of the 30min test)
- Monthly load tests for all generators must meet one of the requirements of NFPA 110 Section 6-4.2 (There must be sufficient information to show how the load tests meet requirements)
- A remote annunciator panel must be installed in a separate location from the generator with an audible trouble signal in a location where it can be heard 24hrs a day (Remote panel trouble indicators should at a minimum mirror the trouble indicators on the generator. If no trouble indicators on generator, remote panel should consist of a general audible and visual trouble alarm)
- If generator is located indoors there must be a battery-powered emergency light in the generator room. If the generator is located outdoors then there either needs to be battery-powered emergency light at the generator location or it needs to be accessible for a car to provide illumination with its headlights (A flashlight at the generator location does not meet this requirement)

Other topic discussed with K 144 tag:

1. Weekly inspection for routine maintenance inspection- when the generator is not running. This needs to be well documented.

#### K18 -Corridor Doors

- Corridor doors can be held open with a device that releases with a push or pull of the door, if the door is not required to be self-closing or automatically releases upon activation of the fire alarm system if required to be self-closing
- Corridor doors in sprinklered buildings must be smoke resisting (gap between the face of the door and the stop on the frame cannot exceed .5in). Corridor doors in nonsprinklered building must be 20 min fire resistance rated or be 1.75 in solid bonded wood core and must be smoke resisting (gap between the face of the door and the stop on the frame cannot exceed .25in.
- Corridor doors require automatic positive latches

#### K50- Fire Drills

- Fire drills must be documented (Time, date, transmission of alarm, etc.)
- Fire drills must be conducted at a frequency of one per shift per quarter
- Fire drills must be conducted under varying conditions (Time during shift, location, type of fire, etc.)

Other topics discussed with K50 tag:

1. 3 of the 4 fire drills are within an hour of each other are viewed to establish a pattern of noncompliance;
2. 75% threshold is being used with transmission equipment tested quarterly

3. Document as much detail as necessary to prove fire drills were done-The time, what it showed, when done, who did it, etc.

#### K38- Means of Egress

- The floor level on each side of the door must be level (in existing buildings there can be grade change if the change is equal to that on one step)
- Delayed-egress devices can only be installed in a building that has either a complete sprinkler system or completed fire detection system. Also, there must be an instruction sign on the door with a delayed-egress device. Delayed-egress devices must release upon activation of the fire alarm or within 15 seconds of an acceptable amount of force being applied to the door for no more than three seconds. Also, there can only be one delayed-egress device in means of egress
- Doors must open with only one releasing operation
- Means of egress must be clear and unobstructed at all times and useable in all weather conditions.

#### K147 - Electrical

- Unacceptable use of power strips (Daisy-chained, high-current draw devices, medical equipment)
- Missing junction box, light switch or electrical outlet cover plates
- Extension cords being used for more than temporary use

Other topics discussed for K 147 tag:

1. Power strips can be used for TVs, computers- when used properly and they do not create a tripping hazard.

#### K25-Smoke Barriers

- Continuity of smoke barriers (Outside wall to outside wall or other smoke barrier and from floor to roof/floor deck above)
- Properly fire stopped penetrations (Existing penetrations must resist the passage of smoke. New penetrations need an approved through penetration system)
- Properly fire stopped smoke barrier/floor joint system (flutes of corrugated metal decks cannot be left open or be filled with only insulation or other loose filled material)
- Expandable foam cannot be used (Fire rated expandable foam does not contain a fire resistance rating. It only has a flame spread rating)
- Smoke barriers must be continuous to the roof deck of a roof/ceiling assembly

Other topics discussed for K.25:

1. Know where your smoke barriers go. They must be continuous to the outside wall.
2. Smoke/fire barriers-fire stop rating must be on both sides of the walls.

K52- Fire Alarm system Testing and Maintenance (K51-Fire Alarm system Installation)

- A fire alarm panel must be installed in a supervised location (24hr staffed or have a smoke detector connected to the fire alarm system the location)
- A trouble signal from the fire alarm system must be able to be heard 24hours a day
- Annual fire alarm system test documentation must be complete, accurate and show test results for all initiating and supervisory devices
- Smoke detectors must be located out of the direct airflow of an air supply or return
- Wall mounted smoke detectors must be installed between 4in and 12in of the ceiling (Measured to the center of the detector)

K56 -Sprinkler System Installation

- Sprinklers cannot be obstructed by other object (light fixtures, ducts, cubicle curtains, storage)
- Sprinklers must be properly spaced from other sprinklers (distance between tow sprinkler should be between 6ft and 15ft)
- Unsupported sprinkler pipe arm overs cannot exceed 24in for steel pipe (12in for copper pipe)
- Sprinkler pipes must be properly supported off the building structures (Hangers must be properly spaced for size and type of pipe and all installed hangers must be maintained in their installed locations)
- All areas of a building must be sprinkler protected for a building to be considered fully sprinklered (Combustible overhangs greater than 4ft, elevator machine rooms, electrical rooms, walk-in coolers/ freezers and closets are the most commonly omitted areas)

Other topics discussed for K56 tag:

1. Facilities must be sprinklered per provision by 8/13/2013 deadline.
2. Full suppression-would be full sprinklered -the entire premise



Selection Criteria	Display all results			
Display Options:				
Provider and Supplier Type(s):	Dually Certified SNF/NFs - Medicare and Medicaid, Distinct Part SNF/NFs - Medicare and Medicaid, Skilled Nursing Facilities (SNFs) - Medicare-Only, Nursing Facilities - Medicaid Only			
State:	Indiana			
Deficiency Tags:	Any K Codes			
Survey Type(s):	Standard			
Survey Focus:	Life Safety			
Year Type:	Calendar Year			
Year:	2012			
Month:	Full Year			
Tag #	Tag Description	# Citations	% Providers Cited	% Surveys Cited
	Totals represent the # of providers and surveys that meet the selection criteria specified above.	Indiana Active Providers = 518	Total Number of Surveys = 408	
K0029	HAZARDOUS AREAS - SEPARATION	131	25.10%	32.10%
K0056	AUTOMATIC SPRINKLER SYSTEM	121	23.00%	29.70%
K0048	EVACUATION PLAN	112	20.10%	27.50%
K0144	GENERATORS INSPECTED/TESTED	112	19.50%	27.50%
K0038	EXIT ACCESS	106	20.30%	26.00%
K0062	SPRINKLER SYSTEM MAINTENANCE	104	19.30%	25.50%
K0050	FIRE DRILLS	91	15.40%	22.30%
K0051	FIRE ALARM SYSTEM	88	15.80%	21.60%
K0064	PORTABLE FIRE EXTINGUISHERS	80	15.30%	19.60%
K0018	CORRIDOR DOORS	77	14.90%	18.90%



## So That's What They Look For

An inside look into Form CMS-2786R

Stephen Pelinski  
Jan. 21, 2010



## Agenda

- RO V Life Safety Code staff structure
- Detailed look into CMS-2786R
  - Example pictures provided when available
- Annual Waiver Process
- FSES Process



## RO LSC Structure

- Safety Engineers
  - Stephen Pelinski (312)886-5215
    - Surveyor
    - IL, MI, MN State Leader
  - Bruce Wexelberg (312)353-2859
    - Surveyor
    - IN, OH, WI State Leader
- LSC Principal Program Representative (PPR)
  - Daniel Kristola
    - Annual waiver and FSES reviewer



## K11 – Fire Barriers

- Fire barriers are the fire resistance rated (FRR) walls that separate the nursing home from a nonconforming building.
- The walls must be at least 2hr FRR.
- A fire barrier could also be a rated wall that separates two portions of the nursing home.
- The wall will be inspected for proper construction and to ensure that all penetrations are properly firestopped.



## K11 – Fire Barriers Cont.

- All doors in the fire barrier will also be inspected.
- Doors must have labels to show they are at least 90min FRR.
- Doors must self-close and latch into the frame.
- If double doors, there must be an astragal at the meeting edge of doors.
- Hold open devices must release upon activation of the fire alarm system.



## K12 – Construction Type

- NFPA 101 Tables 18.1.6.2 and 19.1.6.2 list acceptable construction types.
- Tables are broken down into five construction types.
  - Type I and II – noncombustible
  - Types III, IV, and V – combustible
- K12 takes construction materials, fire ratings, sprinkler coverage, and number of stories into consideration.



**K12 – Construction Type Cont.**

- 19.1.6.2 contains construction types that are acceptable without a complete sprinkler system.
- All nursing homes, regardless of construction type, must be completely sprinklered by Aug. 13, 2013.

**K103 – Interior Wall Construction**

- Interior walls in Type I and II buildings must be constructed of noncombustible or limited-combustible material.
  - Essentially saying wood should not be used as a construction material in a noncombustible building.

**K14/K15 – Interior Finish**

- Flame spread rating documentation is needed for any interior finish applied to walls that is more than 1/28<sup>th</sup> of an inch thick.
- The flame spread rating must be from a test conducted in accordance with NFPA 255.
  - Mostly a concern when carpet has been installed on walls. Carpet is typically tested as a floor application in accordance with NFPA 253.
- NFPA 253 and NFPA 255 are NOT equivalent.
- Flame retardant agents can be applied to achieve an acceptable flame spread rating.
  - Agent must be listed for use with material on which it will be applied.

**K16 – Interior Finish**

- Interior finish requirements for floor finishes.
- Only required for newly installed floor finishes in nonsprinklered areas.
  - Newly installed – Any floor finish installed after March 13, 2003.

**K17 – Corridor Walls**

- Corridor walls must extend to the underside of the roof or floor above in areas that are not fully sprinklered and the walls must have at least a 30min FRR.
- Corridor walls can terminate at a monolithic ceiling in an area that is not fully sprinklered.
  - The entire smoke compartment must have the monolithic ceiling to use this exception
- Corridor walls can terminate at a smoke resisting ceiling in a fully sprinklered area.


**K17 – Corridor Walls Cont.**

- There are eight exceptions for existing health care for spaces that are allowed to be open to the corridor.
- Most common errors in applying the exceptions:
  - Space is used for patient treatment (Therapy Rooms)
  - Space does not have 24hr supervision
  - Space is used for storage that is deemed hazardous




**K17 – Corridor Walls Cont.**

- Openings in corridor walls cannot exceed 20sqin (80sqin in fully sprinklered areas).
- Openings created by sliding glass windows fall under same criteria and openings are measured when window is fully open.
  - Does not apply to a sliding glass window at a nurses station
  - Space open to the corridor exceptions can be applied for a sliding glass window to a receptionist area




**K17 – Corridor Walls Cont.**

- Kitchen to dining room pass through windows are acceptable if the dining room is separated from the corridor by acceptable walls.
- These pass through windows may not be acceptable if the dining room is open to the exit access corridor.
  - Space open to the corridor exceptions cannot be applied to the Kitchen.
  - To keep the pass through, the opening must be protected in a manner that would automatically close the opening upon the local detection of smoke or activation of the fire alarm system.




**K17 – Corridor Walls Cont.**

- Transfer grilles are not acceptable in corridor walls.
  - Dampers do not make transfer grilles permissible




**K18 – Corridor Doors**

- Corridor doors must have at least a 20min FRR in an area that is not fully sprinklered.
  - Labeled door
  - 1.75in solid core wood door
  - Door frames must also be FRR or metal
- Corridor doors must resist the passage of smoke.
  - CMS S&C Memo 07-18
    - Not fully sprinklered – No more than .25in gap between the door jamb and face of door
    - Fully sprinklered – No more than .5in gap between the door jamb and face of door
    - Door jamb acts as an astragal, so the door cannot sag below the jamb




**K18 – Corridor Doors Cont.**

- Other common deficiencies with corridor doors
  - Doors held open by devices that do not release with a push or pull of the door.
    - Kick-stop, wedge, furniture, etc.
    - A magnetic hold-open, friction catch, or closer-brake are acceptable examples.
- Doors do not latch or lack a latching device.



**K22 – Exit Signs**

- Access to exits must be indicated by appropriate exit signs when the path to the exit is not obvious.
  - Directional arrows incorrectly direct evacuees
- When a door that is not an emergency exit but it is obvious that it leads outside the door must be marked with a “NO EXIT” sign.
  - LSC Section 7.10.8.1 specifies the dimensions of the letters on the signs and the language
  - Existing signs do not need to meet 7.10.8.1 if acceptable to AHJ



### K20 – Vertical Openings

- Vertical openings must be enclosed with at least 1hr FRR construction.
  - LSC Section 8.2.5.4, existing enclosures in existing buildings have a 1/2hr FRR, does not apply because the occupancy chapter requirement supersedes it.
- Doors in vertical openings must have a 1hr FRR, must be self-closing, and must normally be kept closed.



### K20 – Vertical Openings Cont.

- Enclosure must extend from the bottom to the top of the building. Otherwise, the top and/or bottom of the enclosure must be capped with 1hr FRR construction.
  - Shaft can terminate in a room related to the use of the shaft if the room meets all FRR requirements for vertical openings (Laundry chute termination room)
- Penetrations into vertical openings must be properly firestopped to maintain the 1hr FRR.



### K20 – Vertical Openings Cont.

- FSES and Vertical Openings
  - An FSES can be used to achieve compliance in lieu of correcting some vertical opening related deficiencies
    - Enclosures that are not constructed with the proper rating
    - Enclosures that are not complete from the bottom of the building to the top
  - An FSES cannot be used to achieve compliance for the lack of required fire dampers in duct penetrations of vertical opening enclosure walls. Similarly, an FSES cannot be used for improper installation of required fire dampers.
    - This deficiency is actually an HVAC deficiency out of NFPA 90A
    - An FSES fails when there is a lack of compliance with NFPA 90A (CMS-2786T Table 8.C.)



### K21 – Self-Closing Door Hold-Opens

- Doors in exit passageways, stairway enclosures, horizontal exits, smoke barriers, and hazardous areas can only be held open by a device that automatically closes the door upon activation of one of the following:
  - Fire alarm system
  - Local smoke detector
  - Sprinkler system



### K21 – Self-Closing Door Hold-Opens Cont.

Unacceptable Hold-Open                      Acceptable Hold-Open



### K33 – Exit Stairways

- Similar requirements to K20 for stairway enclosure construction.
- No enclosed useable space within an exit stairway including under stairs
  - Enclosed space is permitted under stairs if the space is constructed with same FRR of stairway and access to the space is not from within exit stairway
- Unenclosed spaces within stairway shall not be used for any purpose that may interfere with egress
  - No storage or equipment installation in stairway
  - There is no exception to allow storage if the stairway is protected by sprinklers



**K33 – Exit Stairways Cont.**

- No storage or equipment installation in stairway
  - NFPA A.7.1.3.2.3 – This provision prohibits the use of exit enclosures for storage or for installation of equipment not necessary for safety. Occupancy is prohibited other than for egress, refuge, and access. The intent is that the exit enclosure essentially be “sterile” with respect with fire safety hazards

**K23/K24 – Smoke Compartmentation**

- K23 - There must be a smoke barrier to form at least two smoke compartments on every sleeping floor where there are more than 30 residents.
- K24 – Smoke compartment shall not exceed 22,500sqft and travel distance to smoke barrier door cannot exceed 200ft.

**K25 – Smoke Barriers**

- Smoke barrier walls must have a 1/2hr FRR. (1hr FRR for new construction)
- Smoke barriers must be continuous from outside wall to outside wall or to another smoke barrier.
- Smoke barrier must be continuous from the floor to the floor above or the roof.
- Smoke barriers cannot terminate at the bottom of a roof/ceiling assembly.

**K25 – Smoke Barriers Cont.**

- Smoke barrier penetrations must be properly firestopped.
  - Existing penetrations must only be smoke tight
  - New firestopping must maintain the fire resistance rating of the smoke barrier by means of a listed through penetration system
    - Noncombustible penetrations can be firestopped with rigid materials
    - Combustible penetrations must be firestopped with through penetration systems that incorporate intumescent materials that expand when the penetration burns away

**K25 – Smoke Barriers Cont.**

- Windows in smoke barriers must be protected by fire-rated glazing or wired glass and must be in steel frames.
- K26 – There must be adequate space on each side of the smoke barrier for residents.
  - At least 30sqft per resident in the total of all corridors, resident rooms, dining rooms, and other low hazard areas

**K27 – Smoke Barrier Doors**

- Smoke barrier doors must be 20min FRR
  - 1.75in solid bonded wood core can be assumed 20min FRR
- Doors must be self-closing
- Doors that swing in the same direction and have an astragal shall be equipped with a door coordinator that will ensure the doors close in the proper order



**K28 – Smoke Barrier Doors**

- Smoke barrier doors shall provide clear width of 32in
- Vision panels must have fire rated glazing or wired glass and must have steel frames

**K104 – Smoke Dampers**

- Penetrations of smoke barriers by ducts are protected with smoke dampers
  - Not required if the HVAC system and there is a complete sprinkler system on both sides of the smoke barrier
- Dampers are required to be inspected and tested every 4 years
  - Recommended every 2 years
  - 6 year maintenance waiver only applies to hospitals

**K29 – Hazardous Areas**

- Nonsprinklered hazardous areas are required to be separated from other areas by a 1hr FRR enclosure.
  - If ceiling is not 1hr rated, the walls must extend to the roof.
  - Doors are required to be 45min FRR.
  - Doors must self-close, latch, and can only be held open with a device that is compliant with K21

**K29 – Hazardous Areas Cont.**

- Sprinklered hazardous areas are required to be separated from other areas by a smoke resisting enclosure
  - If ceiling is not smoke resisting, the walls must extend to the roof
  - Doors are required to be smoke resisting (No louvers)
  - Doors must self-close, latch, and can only be held open with a device that is compliant with K21

**K29 – Hazardous Areas Cont.**

- Hazardous Areas may include, but are not limited to, the following areas:
  - Boiler and Fuel-Fired Heater Rooms
  - Laundry rooms (Over 100sqft)
  - Repair and Paint Shops
  - Laboratories (Severe hazard is K31)
  - Combustible Storage Rooms (Over 50sqft)
  - Trash Collection Rooms
  - Soiled Linen Rooms

**K29 – Hazardous Areas in New Construction**

- Sprinklers are required in all new construction, so certain hazardous areas are required to have a 1hr FRR enclosure in addition to the sprinkler protection
  - Boiler and Fuel Fired Heater Rooms
  - Laundry Rooms(Over 100sqft)
  - Laboratory(Severe Hazard)
  - Paint Shops(Less than Severe Hazard)
  - Maintenance Shops
  - Soiled Linen Rooms
  - Combustible Storage Rooms(Over 100sqft)
  - Trash Collection Rooms





**K30 – Gift Shops**

- Must be protected as a hazardous area when used for storage or display of combustibles in hazardous quantities
- Must have smoke resisting walls if displays are not in hazardous quantities, have separate protected storage, and are completely sprinklered
  - Can be open to the corridor if less than 500sqft



**K211 – Alcohol Based Hand Rubs(ABHR)**

- Where ABHR dispensers are installed:
  - The corridor must be at least 6ft wide
  - Maximum capacity per dispenser is .3gal(.5gal in suites of rooms) – 1.2L and 2.0L
  - Minimum 4ft spacing between dispensers
  - No more than 10gal(37.8L) in one smoke compartment



**K211 – ABHR Cont.**

- Where ABHR dispensers are installed:
  - Storage of quantities greater than 5gal(18.9L) must meet requirements of NFPA 30
  - Dispensers are not installed over or adjacent to an ignition source
    - Light switch, electrical outlet, electrical equipment, etc.
    - No measurements to define distances
    - If adjacency is in question, look for evidence of splash from ABHR
  - If floor is carpeted, building must be fully sprinklered



**K32 - Exits**

- Not less than two exits are provided for each floor or smoke compartment in a building
  - One of two required exits may be a horizontal exit
  - Evacuation from a smoke compartment through a door that is not a direct exit shall not require returning to the smoke compartment of fire origin to reach a direct exit



**K34 – Means of Egress (Stairways)**

- Stairways and smokeproof towers must:
  - Meet dimension standards of LSC Table 7.2.2.2.1(a) or (b)
  - Be constructed with completely noncombustible construction in Type I or II buildings
  - Have guards when more than 30in above grade or floor below(Also applies to ramps)
    - At least 42in high
    - Must have intermediate rails that would stop a 4in sphere



**K34 – Means of Egress (Stairway) Cont.**

- Stairways and smokeproof towers must:
  - Have handrails installed between 34in and 38in that extend for the entire stairway(Also applies to ramps)
    - Existing handrails permitted down to 30in
    - New handrails have many requirements regarding shape, size, continual graspability, etc.
    - Single steps or ramps from a sidewalk to a vehicular way are not required to have handrails
  - More requirements at LSC Section 7.2.2 and 7.2.3



**K35 – Means of Egress (Exit Width)**

- Requirements specific to health care
  - .6in per person for exit stairs (.3in in fully sprinklered buildings)
  - .5in per person for doors, ramps, horizontal exits (.2in in fully sprinklered buildings)
- Other areas must meet general requirements in Section 7.3
  - Means of egress must be sufficient for occupant load of story or other occupied space
    - Capacity calculations are based on evacuation of one story at a time
    - Converging means of egress must be sufficient to accommodate both means of egress from the convergence point

**K36 – Means of Egress (Travel Distance)**

- Travel distance measured in accordance with Section 7.6
  - Measured on the floor, along natural path of travel (closest exit), curving around corners with 1ft clearance, and ending at the center of the door
- Travel distance from exit access door to exit shall not exceed 100ft (150ft in fully sprinklered building)
- Travel from any point in a room to an exit shall not exceed 150ft (200ft in fully sprinklered building)
- Travel from any point in a suite to an exit access door shall not exceed 100ft

**K37 – Means of Egress (Dead-end Corridors)**

- Existing dead-end corridors are permitted if it is impractical to alter them
- Dead-end corridors cannot exceed 30ft in new construction
  - Cannot create a new dead-end corridor that exceeds 30ft when altering a facility's evacuation plan

**K38 – Means of Egress (Accessibility)**

- Walking surface must be level, clear, and unobstructed at all times and useable under all weather conditions
  - Storage not permitted in corridors
  - Abrupt changes in elevations shall not exceed 1/4in
    - Under 1/2in can be beveled
    - Over 1/2in must be corrected by other means
  - Snow, ice, water, soft ground are examples of impediments that can obstruct egress by individuals that use walkers, wheelchairs, or require other forms of assistance

**K38 – Means of Egress (Painted Doors)**

- Exit doors or exit access doors cannot be painted/disguised in a manner that obscures their use as a door
  - A door that contains a window and has a compliant exit sign above the door can be painted if a cognitively aware individual can still tell it's an exit door
  - The window cannot be painted
- This may also be cited at K72

**K38 – Means of Egress (Locked Doors)**

- Special locking arrangements are permitted under certain circumstances in health care facilities
  - Locks are permitted on doors in a means of egress if residents have a clinical need for the extra security measures
    - Door lock regulations also pertain to gates in the means of egress
  - Magnetic locks must release upon activation of fire alarm or loss of power
  - Doors can be locked from the outside to prevent unauthorized entry without obstructing egress



### K38 – Means of Egress (Locked Doors Cont.)

- Special units – All residents have clinical needs
  - All egress doors can be locked
  - All staff members that work in that unit must have the knowledge and ability to unlock doors
    - All staff must have keys (A single key at a nurses station is not acceptable), or
    - All staff must know code and know how to use keypad
- Mixed Population – Not all residents have clinical needs
  - Doors can be locked, but staff, visitors, and residents without clinical needs must have ability to use doors



### K38 – Means of Egress (Locked Doors Cont.)

- Delayed-egress locks
  - Permitted on all doors regardless of clinical needs of residents
  - Delay of 15 seconds permitted after pressure applied to door for no more than 3 seconds (30 sec delay exception)
  - Doors must have signs that read:
    - PUSH UNTIL ALARM SOUNDS DOOR CAN BE OPENED IN 15 SECONDS
  - No more than one delayed-egress lock in means of egress
    - Including gates



### K38 – Means of Egress (Locked Doors Cont.)

- Delayed-egress locks Cont.
  - Locks are permitted if the building has either:
    - A complete fire detection system in accordance with LSC Section 9.7
    - A complete automatic sprinkler system in accordance with LSC Section 9.6
  - Sensor-controlled locks must meet delayed-egress lock requirements if they lock in that manner
  - Deadbolt locks are not permitted unless the deadbolt releases with the same action of the door handle



### K39 – Means of Egress (Corridor Width)

- Width of exit access corridors or aisles must be at least:
  - 4ft in existing health care
  - 8ft in new health care
- Measured at the narrowest point
- The constructed width must be kept clear
  - Not permissible to have 2ft of storage in a 6ft wide corridor in an existing building
- Projections less than 3.5in shall be permitted at 38in and below
  - S&C Memo 04-41 – Wall mounted touch screens



### K40 – Means of Egress (Door Width)

- Exit access doors and exit doors must be swinging doors and are:
  - At least 32in in clear width in existing buildings
    - Existing 34in doors that have less than 32in clear width
    - Existing 28in doors where fire plan does not require evacuation by bed, gurney, or wheelchair
  - At least 41.5in in clear width in new buildings
    - 32in in exit stairway enclosures



### K41/K42 – Means of Egress (Exit Access Doors)

- K41 - All resident rooms have a door to a corridor or directly to grade
  - There can be one intervening room between the resident room and the exit access corridor
    - Cannot be hazardous
- K42 – Any resident room or suite of resident rooms larger than 1000sqft have at least 2 exit access doors remote from each other
  - 2500sqft when non-resident room suites
  - Remote is  $\frac{1}{3}$  the measurement of the largest diagonal distance in the room
    - $\frac{1}{3}$  in fully sprinklered building



### K43 – Means of Egress (Exit Access)

- Resident room doors shall not require a key to open from the egress side



### K44 – Means of Egress (Horizontal Exit)

- Not less than 30sqft per resident available on the other side of the horizontal exit
  - Occupiable spaces are permitted for calculation
- Horizontal exit doors are not required to swing with egress travel in existing buildings
- Horizontal exit doors must be swinging with 32in clear width
  - Horizontal sliding doors meeting Section 7.2.1.14 with 32in clear width also permitted



### K45 – Normal Illumination

- All portions of the means of egress must have continuous illumination that:
  - Cannot be controlled by manual switches *7-8-10*
    - Motion sensors are permitted if they are equipped with fail-safe and are set to at least 15min interval
  - Is at least 1ft-candle measured at the floor
  - Failure of one-single bulb cannot leave an area with less than .2ft-candle of illumination
  - Have a reliable power source
    - Battery-operated, portable lamps, or lanterns are not permitted to be the primary illumination source of the means of egress



### K46 – Emergency Illumination

- All portions of the means of egress must have emergency illumination that:
  - Cannot be controlled by manual switches
    - Motion sensors are permitted if they are equipped with fail-safe and are set to at least 15min interval
  - Provides required levels of illumination for 90min
  - Is at least on average 1ft-candle measured at the floor and not less than .1ft-candle at any point
    - .6ft-candle average and .06ft-candle at any point at 90° minute
  - Failure of one-single bulb cannot leave an area with less than .2ft-candle of illumination
- Battery-operated emergency lights must be tested:
  - Monthly for 30sec
  - Annually for 90min
  - Individual results for all lights must be on the records



### K47 – Exit Signs

- Exit signs or directional signs must mark exits or the path to exit
  - Not required in single story buildings with less than 30 people when the path to exit is obvious
- Size, illumination levels, emergency illumination requirements and other requirements located in Section 7.10
- “No Exit” signs are required on doors that are not exits or exit access doors, but may easily be confused as parts of the means of egress



### K105 – Essential Electrical System Wiring

- Buildings that use life support equipment have means of egress illumination, emergency lights, exit and directional lights are supplied by the life safety branch of the essential electrical system
  - Other items permitted on the life safety branch in accordance with NFPA 99
  - Not required if life support equipment is solely for life saving measures
- K105 is only part of the New Health Care Regulation Set, but most requirements are the same for existing health care depending on the requirements when the system was installed



**K107 – Alarm System Backup Power**

- Fire alarm system with backup power required in accordance with Section 9.6
  - Requires compliance with NFPA 72, National Fire Alarm Code
  - Also requires compliance with NFPA 70, National Electrical Code
- K107 is only part of the New Health Care Regulation Set, but most requirements are the same for existing health care depending on the requirements when the system was installed

**K108 – Generator Set Illumination**

- Alarms, emergency communication, and generator sets are illuminated in accordance with NFPA 70, National Electrical Code
- K108 is only part of the New Health Care Regulation Set, but most requirements are the same for existing health care depending on the requirements when the system was installed

**K48 – Written Fire Safety Plan**

- Facilities must have a written fire safety plan that contains the following requirements:
  - Use of alarms
  - Transmission of alarm to fire department
  - Response to alarms
  - Isolation of fire
  - Evacuation of immediate area
  - Evacuation of smoke compartment
  - Preparation of floor and building for evacuation
  - Extinguishment of fire

**K48 – Written Fire Safety Plan**

- Inclusion of RACE (Rescue, Alarm, Contain, Evacuate/Extinguish) is acceptable, but it does not meet the requirements of the LSC without more detail
- Plans should not have different instructions based on staff determining if the fire is small or large
- Fire plans should be tailored to the individual facility
  - They should not be a template or include information that is not relevant to the facility

**K50 – Fire Drills**

- Fire drills must be conducted at a minimum frequency of one per shift per quarter
  - Drills conducted at shift change count for only shift
- Fire drills must include the transmission of the fire alarm signal and simulation of emergency conditions
  - Drills between 9:00pm and 6:00am can be silent drills
  - Transmission should be done the next day
- Fire drills are conducted to train staff in as many different scenarios as possible
  - Conditions (scenario, location, time, etc.) must be varied


**K51 – Fire Alarm System Installation**

- Fire alarm system must be installed in accordance with NFPA 72, National Fire Alarm Code
  - Fire alarm panel must be installed in a location where it's monitored 24hrs a day
    - Direct staff supervision
    - Electronic supervision by a smoke detector tied to fire alarm system
  - Fire alarm trouble signal must be in a location where it's likely to be heard 24hrs a day
    - Panel in 24hr staffed location
    - Remote annunciator panel with an audible and visual trouble signal in a 24hr staffed location
      - Monitoring station is not an acceptable means of monitoring trouble signal




### K51 – Fire Alarm System Installation

- Fire alarm system must have a reliable source of backup power
- Manual pull stations must be installed at:
  - Proper heights
  - Within the path of egress near all exit doors
  - Must be accessible and must not be obstructed
  - Must meet other applicable requirements in NFPA 72 Chapter 2
- Must have audible and visible notification devices
  - Existing systems do not have to meet visible notification device requirements




### K51 – Fire Alarm System Installation

- Smoke detectors must be appropriately installed in accordance with NFPA 72
  - Shall be located more than 4in from a wall on the ceiling or between 4in and 12in from the ceiling on the wall
  - Measurements in NFPA 72 Chapter 2 for maximum coverage of a space by a single smoke detector
  - Shall not be installed in the direct airflow of an air supply or return
    - Not within 3ft
  - Located in proper location of sloped ceilings
    - Horizontal line drawn to ceiling at 3ft down from peak
  - Shall not have covers, paint, or other items to obstruct smoke from entering sensing chamber




### K52 – Fire Alarm System Testing and Maintenance

- Testing and maintenance of fire alarm system must be conducted at the proper frequency in accordance with NFPA 72 Tables 7-3.1 and 7-3.2
  - Different components have different test and inspection frequencies
  - Test frequencies for all systems
    - Quarterly testing of the off-premises transmission equipment
    - Annual test of the entire system



### K52 – Fire Alarm System Testing and Maintenance

- Quarterly Testing
  - Off-premises transmission equipment
    - This testing can be done as part of the fire drills if receipt of the fire alarm signal is verified and documented
- Annual Testing
  - Must be conducted in accordance with NFPA 72 Chapter 7 and documented in accordance with NFPA 72 Figure 7-5.2.2
    - Vendors are not required to use NFPA form, but all of the information in the NFPA form must be in the vendor created form
      - Items that are not applicable must be marked as such and not omitted from the form




### K52 – Fire Alarm System Testing and Maintenance

INITIATING AND SUPERVISORY DEVICE TESTS AND INSPECTIONS


Dev. A.S.N.	Device Type	Visual Check	Functional Test	Factory Setting	Alarm Testing	Pass	Fail
_____	_____	✓	✓	_____	_____	✓	✓
_____	_____	✓	✓	_____	_____	✓	✓
_____	_____	✓	✓	_____	_____	✓	✓
_____	_____	✓	✓	_____	_____	✓	✓
_____	_____	✓	✓	_____	_____	✓	✓

- Each device must be individually listed to complete this section in an acceptable manner
- There must be information that shows if a visual check, functional test, and sensitivity test were conducted



### K154/K155 – Sprinkler/Fire Alarm System Out of Service

- If a sprinkler system or fire alarm system is out of service for more than 4hrs in a 24hr period a facility must:
  - Evacuate the affected area, or
  - Conduct an approved fire watch
- Approved fire watch
  - Continuous monitoring of affected area
  - Staff conducting the fire watch must not have any responsibilities in addition to the fire watch
  - Staff must be trained to respond appropriately if discovering a fire



**K53/K109 – Smoke Detector Installation**

- Resident rooms and common areas must be equipped with smoke detectors in smoke compartments that are not fully sprinklered
  - S&C Memo 05-25
    - Battery-operated smoke detectors are permissible
    - Must be correctly installed
    - Must have a testing and maintenance program
      - » Monthly tests
      - » Battery replacement as specified by manufacturer
  - Heat detectors cannot be used in place of smoke detectors
- Smoke detectors required in corridors in new health care and limited care facilities

**K54 – Smoke Detector Testing and Maintenance**

- Smoke detectors must be sensitivity tested within 1yr of installation and every 2yrs thereafter
  - Smoke detectors that have pass the initial 1yr test and two 2yr test cycles (5yr total) can have the sensitivity test cycle increased to 5yrs
    - Records must be kept to justify 5yr frequency
  - Sensitivity test must use one of the five test methods listed in NFPA 72 Section 7-3.2.1
  - Sensitivity test results must be appropriately documented
    - Continuous monitoring of sensitivity by fire alarm panels meets tests requirements, but the documentation requirement must still be met
      - » Printouts available for review
      - » Facility representative has ability to show sensitivity levels of all smoke detectors on the fire alarm panel or other electronic method

**K55 – Patient Room Windows**

- All resident sleeping rooms have an outside window or door
  - Sill height specified in new health care
  - Windows in atrium walls meet the requirement
  - Windows onto a corridor do not meet the requirement even if the opposite wall is an outside wall

**K56 – Sprinkler System Installation**

- Sprinklers must be installed throughout a facility in accordance with NFPA 13
  - Complete sprinkler system required for all new construction
  - Complete sprinkler system required for certain existing construction types
  - Complete sprinkler system required for all nursing homes, regardless of construction type by Aug. 13, 2003
    - S&C Memo 09-04
    - Waivers and FSEs for lack of sprinklers in certain areas will no longer be permitted after that date
    - There will be no extensions to complete sprinkler installation

**K56 – Common Errors with Sprinklers**

- Common areas that incorrectly lack sprinkler coverage
  - Closets
    - No size requirements to qualify a space as a closet
  - Combustible overhangs that extend more than 4ft off building
  - Room behind dryers
  - Elevator machine rooms
    - No exception in code
  - Elevator shaft
    - Exceptions can be met
  - Electrical rooms
    - Exceptions can be met
  - Walk-in coolers/freezers
  - Linen/Trash Chutes
  - Attics

**K56 – Common Errors with Sprinklers**

- Items connected to sprinklers or sprinkler pipes
- Sprinklers not properly spaced
  - Between 6ft and 15ft apart with most sprinklers
- Single sprinkler exceeds maximum protection area
- Sprinklers installed within 4in of ceiling/wall joint
- Pendants not between 1in and 12in of ceiling



**K56 – Common Errors with Sprinklers**

- Sprinkler obstructions
  - Light fixtures
  - Cubicle curtains
    - Improperly sized mesh
    - Curtain bunched in front of sprinkler
  - Storage
  - Exit signs
  - Movable walls
  - Book shelf or Filing Cabinet
  - Ductwork
- NFPA 13 Section 5-6 contains tables to show minimum distances from sprinkler to obstructions

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**K60 – Fire Alarm System Activation**

- The fire alarm system must activate notification devices and transmit fire alarm signal upon:
  - Manual fire alarm initiation
    - Manual pull stations
  - Automatic detection
    - Smoke detectors
  - Extinguishment system operation
    - Waterflow device connected to sprinkler system

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**K61 – Sprinkler System Supervision**

- All control valves must be electronically supervised by a device connected to the fire alarm system
  - This is required for compliance with the LSC and supersedes the options available for supervision in NFPA 13
  - Post Indicator Valve must also be monitored
  - Valves that control water supply to floors or other areas of the building

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**K62 – Sprinkler System Testing and Maintenance**

- Testing and maintenance of fire alarm system must be conducted at the proper frequency in accordance with NFPA 25
- Different components have different test and inspection frequencies
- Sprinkler system testing must be conducted by qualified individuals and properly documented
  - NFPA 25 does not contain a required inspection form
  - Appendix B contains some sample forms

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**K62 – Sprinkler System Common Maintenance and Testing Problems**

- Lack of complete supply of spare sprinklers or special sprinkler wrench
- Loaded sprinklers
  - Insulation, lint, grease, paint, corrosion, etc.
  - A sprinkler must be replaced if there is paint on any part of it
- Gauges past due for calibration
- Fire department connection obstructed

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**K62 – Sprinkler System Common Maintenance and Testing Problems**

- Fire department connection caps missing or not secured
- Damaged sprinklers
- Tamper switch and waterflow device not tested
- Five year obstruction investigation if there is evidence that it is necessary
  - NFPA 25 Section 10-2

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### K63 – Sprinkler System Water Supply

- Sprinkler systems have an adequate and reliable water supply
  - NFPA 13 Chapter 7 shows the minimum requirements concerning the amount of water needed to suppress a fire
- Fire pumps if required are in reliable operating condition
  - Tested and maintained in accordance with NFPA 20, Standard for the Installation of Centrifugal Fire Pumps



### K64 – Fire Extinguishers

- Portable fire extinguishers must be installed, tested, and maintained in accordance with NFPA 10, Standard for Portable Fire Extinguishers
- Installation
  - Between 4in and 5ft (No higher than 3.5ft if more than 40lb)
  - Maximum travel distance to Extinguisher
    - Class A (Combustible materials) – 75ft
    - Class C (Live electrical equipment) – 75ft
    - Class K (Kitchen fires) – 30ft



### K64 – Fire Extinguishers

- Testing and Maintenance
  - Inspections approximately every 30 days
    - Conducted in accordance with NFPA 10 Section 4-3.2
    - Documentation of monthly check for each extinguisher
      - » Tag or other record permitted for documentation
  - Annual Inspections
    - Conducted by trained individual in accordance with NFPA 10 Section 4-4
  - Six year maintenance and 12 year hydrostatic tests as applicable
  - Overcharged or undercharged fire extinguishers must be removed and replaced



### K66 – Smoking Regulations

- Facility must have smoking regulations that have the following requirements at a minimum:
  - Smoking in an area where flammable liquids, combustible gases, or oxygen is used or stored is prohibited
  - Smoking by a resident classified as not safe is prohibited
  - Noncombustible ashtrays of safe design shall be provided in all designated smoking areas
  - Metal containers with self-closing lids intended solely for the emptying of ashtrays shall be readily available at all smoking areas



### K66 – Smoking Regulations

- Common problems with smoking
  - Smoking by residents using oxygen
  - Unacceptable receptacles used as ashtrays
    - Coffee cans, clay pots, pop cans, paper cups, etc.
  - Smoking in undesignated areas
  - Unsafe smokers not properly supervised
  - Ashtrays emptied into trash cans
  - Trash placed in metal container for ashtray emptying
  - Snuffing out cigarettes for later



### K67 – HVAC Requirements

- Corridors cannot be used as return air plenums
  - A balanced HVAC system is required
    - If there is an air supply in the corridor there must be an air return in that corridor
    - If there is an air supply in a room there must be an air return in that room
      - » Bathroom exhaust fans can balance a system with a supply in an adjacent room if the fan runs continuously
    - Unbalanced systems are created when there is a supply in a room and only a return in the corridor or vice versa
      - » A bathroom exhaust fan does not create an unbalanced system



**K67 – HVAC Requirements**

- Fire dampers are required where ducts penetrated vertical enclosures
  - This deficiency results in a "Not Met" at CMS-2786T Table 8.C
  - The "Not Met" results in a failing FSES
  - An FSES cannot be used to correct this deficiency

**K68 – Combustion Air**

- Combustion and ventilation air for boiler, incinerator, and heater rooms is taken from and discharged to the outside
- Combustion and ventilation openings shall not be blocked to prevent air movement
- Heating devices must have safety features to immediately stop the flow fuel and shut down the equipment for excessive temperature or ignition failure

**K69 – Cooking Facilities Protection**

- Cooking facilities protected in accordance with NFPA 96
  - Not required for serving kitchens where cooking is not conducted
- Hood, exhaust, and grease removal devices installed in accordance with NFPA 96 Chapters 2-5
  - Mesh filters shall not be used
  - Filters installed at an angle not less than 45° from horizontal
- Testing and Maintenance
  - System cleaned at intervals in accordance with NFPA 96 Table 8-3.1
  - Testing required every 6 months by a trained individual

**K69 – Cooking Facilities Protection**

- Range hood extinguishing system
  - Must be UL 300 compliant
    - No dry chemical systems have passed UL 300 and are no longer manufactured
    - CMS did not require an immediate upgrade after NFPA 96, 1998 Edition, and LSC, 2000 Edition, were adopted on Mar 13, 2003
    - Upgrade required if one of these occurred after Mar 13, 2003:
      - System discharged due to a fire
      - 6 year maintenance of dry chemical due
      - 12 year hydrostatic test due
    - Either the 6yr or 12yr must have been due for all systems since 3/13/03, so all systems should be UL 300 compliant

**K69 – Cooking Facilities Protection**

- Common errors in the kitchen
  - No K Type extinguisher
  - No automatic fuel shut-off
  - No manual activation device for range hood suppression system
  - Improperly located or obstructed manual activation device
  - Suppression system does not cover cooking appliances

**K70 – Portable Space Heaters**

- Portable space heaters are prohibited in health care facilities
  - Exception – Space heaters are permitted in nonsleeping staff only areas where the heating element does not exceed 212°F
- Policies
  - A verbal policy is sufficient if portable space heaters are not allowed
  - A written policy is required if the exception is used
    - Must contain at least the language in the exception



### K71 – Laundry and Trash Chutes

- Laundry chute must be enclosed in a 1hr FRR enclosure with 1hr rated self-closing door
- Must be sprinkler protected
- Trash chutes shall discharge into a room that is used for no purpose other than trash collection



### K160 – Elevators

- Any elevator that travels more than 25ft above or below the level that best serves the needs of emergency personnel must be equipped with fire fighter recall
  - Most three-story buildings would meet the 25ft
  - Buildings four or more stories would definitely meet the 25ft
- Elevator upgrade waivers have been granted for up to 3 years



### K161 – Dumbwaiters

- Dumbwaiters must meet the requirement of LSC Section 9.4.2.2
- Power dumbwaiters must include locking devices that prevent the door from opening on floors except where the dumbwaiter is located



### K72 – Furnishing Obstructions of Means of Egress

- No furnishings, decorations, or other objects can obstruct or disguise the means of egress
  - Couches, chairs, tables, or other furniture in the exit access corridor
    - Medication carts, crash carts, and isolation carts are permitted in the corridor
    - Clean linen carts, soiled linen bins, housekeeping carts, computers on wheels, food carts, etc. are permitted while in use
  - Drapes or other items cannot cover exit doors



### K73 – Flammable Furnishings and Decorations

- No furnishings or decorations of highly flammable character
  - Corn stalks, hay bales, cotton cobwebs, real Christmas trees
  - Live potted plants with a root system are permissible
  - Paintings or pictures are permitted to be affixed to the wall if in limited quantities
  - Candles shall not be used
    - Decorative candles permitted if wicks are cut
    - Candles may be lit for religious ceremonies while attended
    - Birthday candles are permitted
      - No residents using oxygen can be in the room with candle



### K74 – Drapes and Curtain Requirements

- Drapes, cubicle curtains, and other loosely hanging fabrics must meet the requirements of NFPA 701
  - Facility must have documentation that shows items meet NFPA 701 or is flame retardant or fire resistant in accordance with an equivalent standard to NFPA 701
  - A tag on the item is sufficient if it contains the required information
  - Not required for shower curtains



### K75 – Soiled Linen and Trash Receptacles

- Soiled linen or trash collection receptacles cannot exceed 32gal
- A capacity of 32gal shall not be exceeded in a 64sqft area
- Mobile receptacles larger than 32gal shall be stored in hazardous rooms when not attended



### K31, K131-K136 - Laboratories

- These 7 K tags apply to the requirements for laboratories in accordance with NFPA 99 Chapter 10



### K76 – Medical Gas Storage and Administration

- Must meet requirements of NFPA 99
- Storage up to 300cuft can be kept in an area that is not a designated storage area
- Storage between 300cuft and 3000cuft must be in a storage room
- Storage over 3000cuft must be in a 1hr FRR enclosure
  - 45min FRR self-closing and latching door
  - Vented outside
- Storage of liquid oxygen must be in a 1hr FRR enclosure
  - Door and venting requirements also apply



### K76 – Medical Gas Storage and Administration

- Common errors
  - Oxygen cylinders not individually secured
    - Casters for liquid oxygen containers secures them from tipping
  - Full and empty cylinders not physically separated
  - Combustible items stored too close to oxygen
  - Alcohol based hand rubs stored in same room
  - Items draped over oxygen containers
    - Can trap vented oxygen from liquid containers
  - Oxygen expelling while not used by a resident



### K76 – Medical Gas Storage and Administration

- Common errors
  - Oxygen used in proximity to flames or heat source
    - Oxygen used while a resident is under a hood hair dryer
    - Oxygen used while a resident was smoking
    - Oxygen used while a resident blew out birthday candles



### K77/K140 – Piped in Medical Gas Systems

- Piped systems must meet the requirements of NFPA 99 Chapter 4
  - Piped systems
    - 4 Levels
  - Vacuum systems
    - 4 levels



**K78 – Anesthetizing Locations**

- Anesthetizing locations must meet the requirements of NFPA 99

**K142 – Hyperbaric Facilities**

- Hyperbaric facilities must meet the requirements of NFPA 99 Chapter 19



**K141 – No Smoking Signs**

- No smoking signs must be located in areas where oxygen is used or stored
  - Not required in each location if smoking is prohibited in the facility and signs are prominently placed at all major entrances



**K142 – Hyperbaric Facilities**

- Hyperbaric facilities must meet the requirements of NFPA 99 Chapter 19



**K143 – Oxygen Transferring**

- Oxygen transferring must be conducted in a properly protected room:
  - 1hr FRR enclosure with a 45min FRR self-closing and latching door
  - Noncombustible floor for the entire room
    - Concrete or ceramic tile
  - Mechanically ventilated to the outside
  - Sprinkler protected
  - Door has a sign stating oxygen transferring is occurring



**K145 – Life Support System Backup Power Requirements**

- All hospitals and nursing homes that admit residents requiring life support must have a Type I Essential Electrical System (EES)
- Type I EES is broken down into the Emergency System and the Equipment System
  - Emergency System has the life safety branch and critical branch
  - Equipment system has the equipment branch only



**K145 – Life Support System Backup Power Requirements**

- Life safety branch permitted items: Means of egress lights, exit signs, alarm systems, communication systems, task illumination(genset), elevators, automatically operated doors
- Critical branch permitted items: Critical care areas, isolated power systems, patient care areas, nurse call, blood banks, telephone equipment, medical task illumination
- Equipment branch permitted items: Suction systems, sump pumps, compressed air systems, smoke control systems, kitchen hood systems, other exhaust systems, other similar systems



### K146 – Generator Installation, Testing, and Maintenance

- K106 established that a Type I EES is required in nursing homes with life support equipment
- Nursing homes without life support equipment that use generators for backup power must have a Type II EES
  - There is an exception in NFPA 99 that allows nursing homes that have a no admit policy for life support to use only batteries for backup power
  - This does not permit a nursing home to have a Type III EES



### K144 – Generator Installation, Testing, and Maintenance

- Type I and Type II EESs must use a Level 1 generator in accordance with NFPA 110
- Level 1 generators must be inspected weekly and tested under load monthly
- Weekly inspections
  - As specified by the manufacturer
  - If manufacturer weekly inspection requirements are unknown, the maintenance schedule in NFPA 110 Appendix A can be used



### K144 – Generator Installation, Testing, and Maintenance

- Monthly load testing must meet one of the following minimum requirements for 30 minutes:
  - At not less than 30% of the nameplate rating
  - With a load that maintains the minimum exhaust temperature as recommended by the manufacturer
- Weekly inspections and monthly tests must be completely documented



### K144 – Generator Common Errors

- Generator lacks a remote annunciator panel
  - Requirement has been in existence in a reduced form since the 1960s
  - Older installations need a minimum panel
    - Audible trouble indicator
    - Visual indicators for trouble and generator operation
- Storage in generator enclosures
- Indoor generators lack battery-powered task illumination
- Natural gas fueled generator lacks proof that the fuel source is reliable



### K146 – Generator Common Errors

- Reliability of natural gas fuel source can be proven with a letter from natural gas vendor that contains:
  - A statement the fuel source is reasonable reliable
  - Description supporting the reasonable reliability assertion
  - A statement of the low likelihood of an interruption
  - Description supporting the low interruption assertion
  - Signature from technical personnel




### K144 – Generator Common Errors

- Test documentation problems
  - Visual inspections are not described
    - Must be itemized each week
    - A document that shows all weekly visual inspections that can be referenced during tests and documentation review
  - Monthly load tests not completely documented
    - Measurements taken from one leg only on a three phase generator
    - Comment that test was more than 30% of nameplate rating with no supporting data




### K147 – Electrical Requirements

- Electrical wiring must be in accordance with NFPA 70, National Electrical Code
- Common problems
  - Power strips used for items other than computers, TVs, and other electronic equipment for which they were designed
  - Unacceptable devices plugged into power strips
    - High current draw: hair dryers, refrigerators, microwaves, coffee pots, air conditioners, etc.
    - Medical equipment




### K147 – Electrical Requirements

- Hospital grade power strips refers only to their mechanical construction
  - They are still not permissible with high current draw devices or medical equipment
- Exposed wiring
  - Missing light switch and outlet covers
  - Missing junction box cover plates
  - Frayed electrical wires
  - Low voltage wires can be exposed




### Annual Waivers

- Annual waiver requests must show two things to be considered
  - Corrective action would create an undue hardship on the facility
  - Lack of corrective action will not adversely affect resident safety
- LSC waiver for recertification surveys are submitted to the state agency
- LSC personnel within the state agency review the waiver request and forward the request with their recommendation to RO V




### Annual Waivers

- LSC PPR reviews the waiver request and makes a decision based on LSC knowledge, SA recommendation, precedent, CO guidance, and safety engineer consultation
- Waiver decisions are sent back to the SA
  - Denials require an acceptable POC be submitted or additional waiver information be submitted
  - Approved waivers are good until the next LSC survey is conducted




### Fire Safety Evaluation System (FSES)

- Form CMS-2786T is completed in accordance with NFPA 101A, 2001 Edition
- CMS-2786T must be completed for all smoke zones
  - One sheet can be used for identical zones with justification
- FSES must reflect all deficiencies that are present the day the form is completed
- A table of alternates can accompany a failing FSES to show how a POC will eventually lead to a passing FSES



### Fire Safety Evaluation System (FSES)

- FSES can be conducted by the SA or they can act as the first reviewer of a facility completed FSES
  - Decision to conduct an FSES is left to the discretion of the SA
- LSC PPR will evaluate submitted FSES
- LSC PPR will accept a passing FSES or submit a list of errors for the SA to pass on to the facility



Questions?





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## FEATURES

FEATURE: HEALTH CARE OCCUPANCIES

### Long Time Coming

**On the eve of a new requirement that all nursing homes in the U.S. be sprinklered, a look back at a half-century of progress—how we got here, the fires that shaped us, and the new challenges that continue to emerge**



Responders carry the body of a victim from the Katie Jane Nursing Home in Warrenton, Missouri, in 1957. A fire gutted the building and killed 72, making it the nation's deadliest nursing home fire on record. (Photo: AP/Wide World)

NFPA Journal®, *January/February 2013*

*By Kathleen Robinson*

By August 13 of this year, all new and existing nursing homes in the United States will be required to install automatic fire sprinklers, without waivers or exceptions, if they wish to continue to qualify for participation in the Medicare/Medicaid reimbursement program. The requirement was enacted by the Centers for Medicare & Medicaid Services (CMS), the federal agency that contracts with states to make sure nursing homes comply with federal standards.

The requirement is a direct result of two deadly nursing home fires that occurred in 2003, as well as the culmination of a half-century of improvements in fire safety regulations aimed at reducing nursing home fires. From portable fire extinguishers to complete-coverage

automatic sprinklers, fire and life safety code requirements have become stricter and more specific, and enforcement efforts more rigorous, making loss-of-life fires in these occupancies increasingly rare.

This year marks the 50th anniversary of the fire at the Golden Age Nursing Home in Fitchville, Ohio, which killed 63 residents. It was the second-deadliest nursing home fire in U.S. history, behind only the Katie Jane Nursing Home fire that killed 72 people in Warrenton, Missouri, six years earlier, in 1957. Together, these fires represent a demarcation of sorts, between the fires that came before and those that came after. They also mark the start of a half-century of dramatic change in nursing home safety, driven by code requirements and the regulatory role of the federal government. Even so, work continues to try to minimize the impact of fires that threaten some of our most vulnerable citizens.

Tom Jaeger, president of Jaeger & Associates and a consultant to the nursing home industry, has nursing home fire information dating back to 1966, before the federal government started to enforce NFPA 101®, Life Safety Code®, in all nursing homes. Figures from 1966 to 1975 indicate there was an average of 15.8 deaths per year in multiple-death nursing home fires, Jaeger says, but in the most recent 10 years, from 2002 to 2011, there were 3.1 deaths per year. "That's a reduction of more than 80 percent," he says. "With the mandatory sprinkler requirement for all new and existing facilities, that number is likely to approach zero in a few years."

Not that fires in nursing homes will necessarily disappear — as the facilities evolve, new fire safety challenges are emerging for both health and safety professionals. As the design of nursing homes becomes more residential and homelike than institutional, their fire protection needs will change. The provisions of NFPA 101 were substantially revised for the 2012 edition to address this, and will continue to be revised over time to protect residents as design concepts are further modified to address "resident first" environments. But as the CMS requirement illustrates, this is a new era for nursing home safety, one that looks very different than it did a half-century ago — or, in some cases, even a decade ago.

#### **A step for Missouri**

While the Golden Age fire may be closer to us by a handful of years, it was the Katie Jane fire that served as the impetus for the first serious effort to reform fire safety regulations in U.S. nursing homes.

The Katie Jane Nursing Home was a 65-year-old wood-frame, brick-clad building that had been turned into a 67-room nursing home with four wards in 1955. The two-and-a-half-story facility was home to 149 residents, many of whom were bedridden and some of whom were locked in their rooms. Fire safety precautions consisted solely of portable fire extinguishers, according to an NFPA fire investigation report from March 1957. There were no sprinklers, fire alarms, enclosed exit stairwells, outside fire escapes, or emergency lighting, and there were no fire drills or fire safety plan informing staff and residents how to respond in an emergency. There were



Firefighters work on the roof of the Greenwood Health Center in Hartford, Connecticut, after a three-alarm fire swept the facility. (Photo: AP/Wide World)

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### **THE 10 DEADLIEST FIRES IN THE UNITED STATES FOR OLDER ADULTS SINCE 1950**

**Katie Jane Nursing Home**  
Warrenton, Missouri  
February 17, 1957  
72 killed out of 149 patients

**Golden Age Nursing Home**  
Fitchville, Ohio  
November 23, 1963  
63 killed out of 84 patients

**Nursing home**  
Largo, Florida  
March 29, 1953  
33 killed, including 32 out of 45 patients

**Convalescent home**  
Marietta, Ohio  
(Nurses were present but it may not have been a nursing home)  
January 9, 1970  
31 killed out of 46 patients

**Rest home**  
Keansburg, New Jersey  
(A sheltered care facility, not a nursing home; some residents were older adults)  
January 9, 1981  
31 killed out of an unreported total of residents

**Nursing home (intermediate care-type)** Chicago, Illinois  
January 30, 1976  
24 killed out of 83 patients

**Boarding home**  
Bradley Beach, New Jersey  
(Boarding home, not a nursing home; most residents were older adults)  
July 26, 1980  
24 killed out of 36 residents

**Convalescent home**  
Hoquiam, Washington

no meaningful state regulations that required these features, and there was no federal oversight program that would have mandated such features.

On February 17, 1957, a fire began in an annex attached to the back of the home's main building and smoldered for some time before a visitor discovered it around 2:30 p.m. During the five minutes it took the visitor to find a staff member and for the staffer to notify the fire department, 11 patients managed to escape. By the time firefighters arrived, five minutes later, the fire had grown out of control, and rescue efforts were futile. Seventy-seven residents made it out alive. Many of the victims died in their beds, or locked in their rooms. Appalled at the loss of life, Missouri Governor James T. Blair told the press that "the animals in the field take better care of their own."

A month later, Blair signed legislation approving the Nursing Home Licensing Law, which tightened nursing home safety regulations, mandated inspections, and put tough penalties in place for facilities that did not comply. The law gave the Missouri Division of Health broad powers to establish and enforce minimum safety standards on convalescent homes and nursing homes throughout the state.

Nationally, similar standards had been on NFPA's books for years. The Building Exits Code, the precursor to the Life Safety Code, recognized the special challenges associated with buildings where occupants could not easily exit or escape under their own power, such as facilities for the sick and infirm. In 1926, the draft version of the Building Exits Code had identified and developed the criteria now known as the "total concept" to emphasize the importance of fire-resistive construction, sprinkler systems, and the need for staff involvement in the safety of occupants.

Even so, fire safety remained a problem in U.S. hospitals and nursing homes. In 1929, a fire at the Cleveland Clinic killed 125. In 1949, St. Anthony Hospital in Effingham, Illinois, burned, killing 74. In 1950, a fire at Mercy Hospital in Davenport, Iowa, killed 41. In 1951, a fire at a convalescent home in Washington state killed 21. In 1952, 20 people died in a fire at the Cedar Grove nursing home in Missouri. In 1953, a nursing home fire in Florida killed 32.

#### **Sprinklers delayed, with deadly consequences**

While refinements were made to the Life Safety Code, including a separate section addressing the safety needs of hospitals, nursing homes, and residential custodial care homes, adoption and enforcement of the code by states and jurisdictions was inconsistent, and fires in nursing homes continued. Among them was the fire at the Golden Age Nursing Home.

Originally built in 1948 as a toy factory, the single-story building that housed Golden Age was eventually renovated into a nursing facility for 86 residents. Like Katie Jane, Golden Age had no sprinklers, fire detection system, manual fire alarms, emergency lighting, or written emergency procedures. It also did not have a water supply for firefighting. The extent of its fire safety features consisted of three portable fire extinguishers.

The fire started shortly after 4:45 a.m., when a series of small fires in the attic and walls merged into one larger blaze. A staff member discovered the fire and tried to call the fire department, but the fire had already burned through the phone line. A passing motorist made the call at 5 a.m. By the time firefighters arrived, 10 minutes later, the roof and one wing of the building were in flames and "it was impossible to enter the building," wrote Ernest Juillerat, manager of NFPA's Fire Record Department, in his report. Only 21 of the nursing home's 84 residents made it out alive. Investigators later blamed the fire on faulty electrical wiring, noting that the building violated many provisions of the National Electrical Code® (NEC®).

In his report, Juillerat noted that Ohio had adopted regulations requiring nursing homes to install automatic sprinklers or a fire detection system and to comply with NEC requirements. The regulations were originally scheduled to take effect on February 1, 1961, but court actions brought by the Ohio State Federation of Licensed Nursing Homes were holding up their implementation when the Golden Age fire occurred.

In May 1964, U.S. Senate hearings on nursing home safety brought together the America Nursing Home

(May not have been a nursing home)  
January 30, 1951  
21 killed out of 29 patients

**Nursing home**  
Hillsboro, Missouri  
October 31, 1952  
20 killed out of 70 patients

**Greenwood Health Center**  
Hartford, Connecticut  
February 26, 2003  
16 killed out of 148 patients  
Source: NFPA

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Association, the National Council on Aging, the National Rehabilitation Commission, and NFPA, among others, who told the Special Committee on Aging that, although regulations for nursing homes, including fire safety regulations, were available, they were not uniformly adopted or, as in the case of Ohio, enacted. As a result, between 1964 and 1967 the U.S. Congress and the Department of Health, Education and Welfare worked towards a plan to incorporate by reference the Life Safety Code requirements that applied to nursing homes. In the late 1960s, federal rulemaking implementing the use of the Life Safety Code was approved and finalized, including provisions for the regulation and oversight of nursing homes. The act stated explicitly that as of January 1, 1970, skilled nursing facilities had to meet the provisions of the 1967 edition of the Life Safety Code that were applicable to nursing homes in order to continue to satisfy one of the Conditions of Participation (COP) to qualify for Medicare/Medicaid reimbursement.

The substance of the 1967 edition of the Life Safety Code included many of the same concepts included in the 2012 code. These include two-hour separation requirements between the areas of a nursing home used for health care purposes and other areas; increased travel distances when automatic sprinklers are present; and limited conditions with respect to door locking. The code also required automatic sprinkler systems in new construction, except when fire-resistive construction was used and building-wide fire alarm systems were present.

Partly as a result of these provisions, which the federal government amended several times over the next three decades to comply with newer editions of the Life Safety Code, the number of large loss-of-life fires saw a steady decline. Between 1966 and 1975, there were 19 multiple-death fires in U.S. nursing homes, resulting in 158 deaths, according to data collected by Jaeger. From 1976 to 1985, three multiple-death fires killed 35 people. And from 1986 to 1995, four multiple-death fires killed 22 people.

"Prior to 1970, there was no national enforcement of fire and life safety in nursing homes," says Jaeger. "It was all done by individual states. Once the Life Safety Code was adopted nationally for nursing homes in 1970, the losses started to drop rapidly, even though the Life Safety Code, the recognized standard of care, did not require sprinklers in all health care facilities. The national enforcement of the code was working, even though it did not mandate sprinklers."

#### **The last straw**

In 2003, however, in what can only be described as a setback, two deadly fires again focused attention on fire safety in nursing homes.

The first occurred in February at the Greenwood Health Center in Hartford, Connecticut, when a mentally disturbed patient set her bedding on fire with a cigarette lighter. According to NFPA's investigation report, the fire spread to adjacent rooms and entered the building's eaves before firefighters extinguished it. Ten residents died at the scene, and six more died later.

Unlike Golden Age or Katie Jane, the Greenwood Health Center largely complied with the state fire safety code. Interior walls of gypsum board provided a half-hour fire-resistance rating. Concrete block walls extending from the floor slab to the roof deck separated patient rooms, and the rooms' solid-core wood doors, which opened directly onto the corridor, had positive latching hardware. Smoke barriers divided the facility into 11 smoke compartments, with corridor doors that closed automatically when the fire alarm system activated. The facility also had an emergency generator, a fire alarm system connected to the Hartford Fire Department, and smoke detectors in the corridors and common areas that were tested monthly by staff and twice a year by an outside contractor. A chemical extinguishing system in the kitchen protected the exhaust hood. It, too, was inspected and maintained by an outside contractor. In addition, a single automatic sprinkler protected the laundry chute between the first floor and the basement, and portable fire extinguishers had been installed throughout.

But an important fire safety feature was missing: complete-coverage automatic sprinklers, which were not required by the state. (A discrepancy in how the staff responded to the fire — a key component in the "total concept" safety idea — was also noted as a contributing factor in the outcome of the fire.)

Complete-coverage automatic sprinklers were also missing from the NHC Healthcare Center in Nashville, Tennessee. Because the facility was housed in a brick and steel structure built in the mid-1960s, it was required by the State Health Department to add sprinklers only if it was extensively renovated. The only sprinkler in the building was in the kitchen, over the grill. In September, a fire of unknown origin swept through the facility, killing 15. When asked by a reporter if sprinklers would have changed the outcome, Nashville Assistant Fire Chief Lee Bergeron said they "definitely would have made a difference."

In 2004, the Government Accountability Office (GAO) issued a study that looked at the entire oversight program dealing with nursing home fire safety and recommended, among other things, that the CMS explore the feasibility of requiring sprinklers in all nursing homes. A discussion was already underway with the NFPA Technical

Committee about changing the Life Safety Code to require sprinklers in all existing nursing homes in the aftermath of the two fires in 2003, and NFPA's review of the draft GAO report in May 2004 simply confirmed and reinforced the concept, says Robert Solomon, NFPA division manager for Building Fire Protection and Life Safety.

Knowing there would be pressure to improve fire safety in its facilities, the nursing home industry decided to become proactive, asking itself which fire protection systems would provide the best protection for the money. The answer was sprinklers. As a result, the industry submitted a proposal to the Life Safety Code committee and to CMS to mandate sprinklers in all existing nursing homes. (The 1991 edition of NFPA 101 had been revised to require all new health care occupancies, including nursing homes, to be protected with automatic sprinklers.) NFPA accepted the proposed revisions to the 2006 edition of the Life Safety Code, requiring the installation of automatic sprinklers in all existing nursing homes. CMS issued its final rule on August 13, 2008, requiring nursing homes across the United States to install automatic fire sprinklers, without waivers or exceptions, by August 13, 2013, if they wish to continue to qualify for participation in the Medicare/Medicaid reimbursement program. If they do not, they will face financial penalties or even loss of their ability to participate in their reimbursement program altogether.

### **Brave new sprinklered world**

NFPA statistics for 2006–2010 showed that sprinklers were present in 70 percent of the reported fires in licensed nursing homes. Faced with nursing home fires large enough to activate an operational sprinkler system, sprinklers operated 89 percent of the time and operated effectively 87 percent of the time. Of the 13 percent of cases where there was not effective operation, roughly half were because the sprinklers were turned off before the fire began.

As many as 95 percent or more of U.S. nursing homes are already sprinklered, Jaeger says, meaning that other fire safety compliance options are now available, in part because fire safety must be balanced with other types of health and safety issues. For example, many nursing homes lock their doors to keep residents suffering from dementia from "eloping," or wandering away from the facility unattended. This was not always necessary in the past, because the population of nursing homes was often more mentally acute than they are today. In fact, had they lived today, many would probably be in assisted living centers rather than nursing homes.

Some nursing homes also allow dispensers for hand sanitizers — a Class A flammable liquid — in hallways to prevent the spread of infections, a calculated risk/benefit in safety made possible by the presence of complete-coverage automatic sprinklers.

Another trend that may have an influence on fire risk is the move toward making facilities more residential and less institutional than they were in the past. Nursing homes may become smaller, Jaeger says, with 12 to 16 beds on a floor or ward, rather than the current 35. They might have fully functioning kitchens that the residents can use under staff supervision, and common gathering rooms may open to hallways. In short, nursing homes will become more like homes—and so will the attendant fire risks.

"As baby boomers age, they'll demand this type of facility," says Jaeger. "Since nursing homes might be the boomers' final homes, they want them to be as comfortable as possible."

With the design of U.S. nursing homes changing, we will begin to accept a little more fire risk, says Jaeger, much as we do in our own homes. Sprinklers can counterbalance both the changes in fire safety requirements and residential trappings by keeping any fire that may occur as small and circumscribed.

Despite his predictions, Jaeger is quick to add that the health care industry is changing rapidly, and that speculation on what it may look like decades down the road is just that. But he enjoys pointing out a cold fact: there has never been a multiple-death fire in a sprinklered health care occupancy in the United States. And that includes nursing homes.

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**Kathleen Robinson** is director of editorial operations for NFPA Journal.

### **In this Section:**

- › **Prepping for the Worst**  
Hurricane Sandy tested emergency procedures at health care facilities all along the East Coast. Can new provisions in NFPA 99, Health Care Facilities, help ensure things go smoother during the next big storm?
- › **Long Time Coming**  
On the eve of a new requirement that all U.S. nursing homes be sprinklered, a look back at 50 years of progress and the new challenges that continue to emerge.

- > **Rebuilding a Hospital**  
How key lessons learned from the 2011 tornado in Joplin, Missouri, are being incorporated into the design, construction, and emergency planning of the new Mercy Hospital Joplin.
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