


NFPA 101
Life Safety Code

30th Annual Ride Safety Inspection Forum

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Presented by Ken Berryhill and Nancy Heard



History of NFPA 101

- NFPA – 1895 – Boston (Factory Mutual, Grinnell Fire Protection, Industrial Risk Insurers)
- 1913 – Committee on Safety to Life
- Issued Pamphlet “Exit Drills in Factories, Schools, Department Stores, and Theaters”
- 1927 – “Building Exits Code”
- 1942 – Coconut Grove Night Club Fire (Boston, 492)

History of NFPA 101

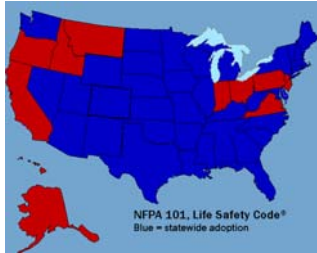
- 1946 – Three more fatal fires (Chicago, Dubuque, Atlanta 199)
- 1963 – Title changed to “Code for Safety to Life From Fire in Buildings and Structures”
- 1984 – Great Adventure Haunted Castle Fire (Jackson, New Jersey, 8)
- 2003 – Station Night Club Fire (Rhode Island, 100)
Added new requirements for nightclubs into NFPA 101

History of NFPA 101

- 2016 – Ghost Ship Warehouse (Oakland, CA 36)
- Today more than 300 members of 15 technical committees contribute and develop the Life Safety Code.
- 500 Pages, 43 Chapters, 3 Annexs

History of NFPA 101

- Currently used in every U.S. state and adopted statewide in 43 states.



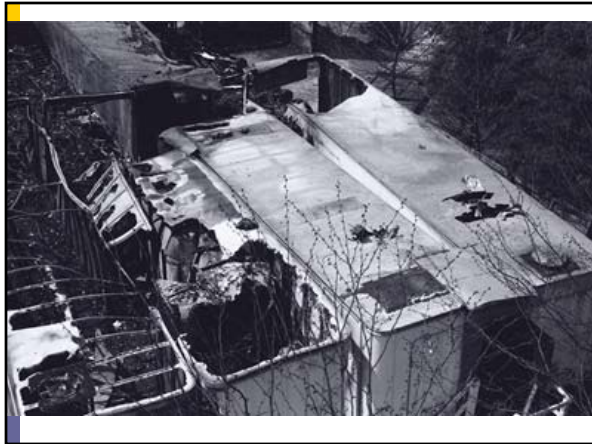
Scope of NFPA 101

- High Rise Structures
- Tent (Membrane) Structures
- Assembly Structures
- Educational Structures
- Day-Care Facilities
- Health Care Facilities
- Detention and Correctional Facilities
- Hotels, Dormitories, Apartments
- Mercantile, Business, Industrial

Great Adventure Haunted Castle Fire May 11, 1984

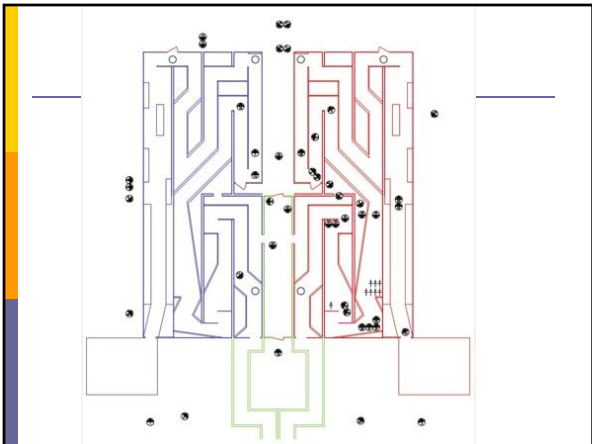
- Built in 1978
- Constructed of 17 commercial trailers (each about 8' x 40') joined together with plywood walkways.
- Materials used were plywood, foam rubber, fabrics, plastics, and tar paper.
- Codes not enforced due to "temporary structure".
- Resulted in deaths of 8 teenagers.















Great Adventure Haunted Castle Fire May 11, 1984

- Major factors contributed to loss of life:
 - Failure to detect and extinguish the fire at its incipient stage by means of fixed fire detection and suppression systems,
 - Ignition of synthetic foam materials and subsequent fire and smoke spread involving combustible interior finishes; and
 - Difficulty of escape by occupants based on fire conditions in the haunted house type of environment.

Chapter 1 Administration

- Purpose of the code is to provide minimum requirements, with due regard to function, for the design, operation, and maintenance of buildings and structures for safety to life from fire. Its provisions will also aid life safety in similar emergencies. (1.2)
- Shall apply to both new construction and existing buildings and existing structures. (1.3.1)
- Shall apply to vehicles and vessels when used as buildings. (1.3.2)

Chapter 1 Administration

- Addresses those construction, protection, and occupancy features necessary to minimize danger to life from the effects of fire, including smoke, heat, and toxic gases created during a fire. (1.1.2)
- Establishes minimum criteria for the design of egress facilities so as to allow prompt escape of occupants from buildings or, where desirable, into safe areas within buildings. (1.1.3)

Chapter 3 Definitions

- Special Amusement Building
- A building that is temporary, permanent, or mobile and contains a device or system that conveys passengers or provides a walkway along, around, or over a course in any direction as a form of amusement arranged so that the egress path is not readily apparent due to visual or audio distractions or an intentionally confounded egress path, or is not readily available due to the mode of conveyance through the building or structure. (3.3.36.10)
- Special amusement buildings include amusements such as a haunted house, a roller coaster-type ride within a building, a multilevel play structure within a building, a submarine ride, and similar amusements where the occupants are not in the open air. (A.3.3.36.10)

Chapter 3 Definitions

- **Assembly Occupancy.** An occupancy (1) used for a gathering of 50 or more persons for deliberation, worship, entertainment, eating, drinking, amusement, awaiting transportation, or similar uses; or (2) used as a special amusement building, regardless of occupant load.
- **Authority Having Jurisdiction (AHJ).** An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

Chapter 4 General

- **4.5.3.1 Number of Means of Egress.** Two means of egress, as a minimum, shall be provided in every building or structure, section, and area where size, occupancy, and arrangement endanger occupants attempting to use a single means of egress that is blocked by fire or smoke. The two means of egress shall be arranged to minimize the possibility that both might be rendered impassable by the same emergency condition.
- **4.5.3.2 Unobstructed Egress.** In every occupied building or structure, means of egress from all parts of the building shall be maintained free and unobstructed. Means of egress shall be accessible to the extent necessary to ensure reasonable safety for occupants having impaired mobility.

Chapter 7 Means of Egress

- A continuous and unobstructed way of travel from any point in a building or structure to a public way consisting of three separate and distinct parts: (1) the exit access, (2) the exit, and (3) the exit discharge.
- **Exit.** That portion of a means of egress that is separated from all other spaces of a building or structure by construction or equipment as required to provide a protected way of travel to the exit discharge.
- **Exit Access.** That portion of a means of egress that leads to an exit.
- **Exit Discharge.** That portion of a means of egress between the termination of an exit and a public way.

Chapter 7 Means of Egress

- **7.2 Components.** Stairs, Doors, Hardware, Turnstiles, Elevators, Guardrails/Handrails
- **7.3 Capacity.** Occupant Load Factors, Capacity of Exits
 - In areas not in excess of 10,000 ft² (930 m²), the occupant load shall not exceed one person in 5 ft² (0.46 m²).
 - In areas in excess of 10,000 ft² (930 m²), the occupant load shall not exceed one person in 7 ft² (0.65 m²).
- **7.4 Number of Means of Egress.** The number of means of egress from any balcony, mezzanine, story, or portion thereof shall be not less than two, except under one of the following conditions:
 - (1) Occupant load more than 500 but not more than 1000— not less than 3
 - (2) Occupant load more than 1000 — not less than 4

Chapter 7 Means of Egress

- **7.5 Arrangement of Means of Egress.**
- **7.6 Travel Distance to Exits.**
- **7.8 Illumination of Means of Egress.**
- **7.9 Emergency Lighting**
- **7.10 Marking of Means of Egress**
- **7.14 Elevators**

Chapter 12 & 13 Assembly Occupancies

- **New Assembly (Chapter 12)**
- **Existing Assembly (Chapter 13)**
- **Section 1 – General Requirements**
- **Section 2 – Means of Egress Requirements**
- **Section 3 – Protection**
- **Section 4 – Special Provisions**
 - Special Amusement Building
- **Section 5 – Building Services**
 - Elevators, Utilities, HVAC
- **Section 7 - Operating Features**
 - Emergency Plans, Drills, Inspections

Assembly Exits

- **Exit Doors.** Any door in a required means of egress from an area having an occupant load of 100 or more persons shall be permitted to be provided with a latch or lock only if the latch or lock is panic hardware or fire exit hardware complying with 7.2.1.7.
- **Door Leaf Swing Direction.** Door leaves required to be of the side-hinged or pivoted-swinging type shall swing in the direction of egress travel where serving a room or area with an occupant load of 50 or more.


Assembly Travel Distance

- **Travel distance to Exit.** Shall be measured in accordance with Section 7.6.
- Exits shall be arranged so that the total length of travel from any point to reach an exit shall not exceed 200 ft (61 m) in any assembly occupancy, unless in assembly occupancies protected throughout by an approved, supervised automatic sprinkler system. In these cases the travel distance shall not exceed 250 ft (76 m).

Assembly Exit Markings




- **Marking of Exits.** Exits, other than main exterior exit doors that obviously and clearly are identifiable as exits, shall be marked by an approved sign that is readily visible from any direction of exit access.
- **Door Tactile Signage.** Tactile signage shall be provided to meet all of the following criteria, unless otherwise provided in 7.10.1.4:
 - (1) Tactile signage shall be located at each exit door requiring an exit sign.
 - (2) Tactile signage shall read as follows: EXIT.
 - (3) Tactile signage shall comply with ICC/ANSI A117.1, *American National Standard for Accessible and Usable Buildings and Facilities*.
- **Exit Access.** Access to exits shall be marked by approved, readily visible signs in all cases where the exit or way to reach the exit is not readily apparent to the occupants.



Assembly Alarms

- **Initiation.**
- Initiation of the required fire alarm system shall be by both of the following means:
 - (1) Manual means, unless otherwise permitted by one of the following:
 - (a) where initiation is by means of an approved automatic fire detection system that provides fire detection throughout the building.
 - (b) where initiation is by means of an approved automatic sprinkler system that provides fire detection and protection throughout the building.
 - (2) Where automatic sprinklers are provided, initiation of the fire alarm system by sprinkler system waterflow, even where manual fire alarm boxes are provided in accordance with 12.3.4.2.1(1)



Assembly Alarms

- The initiating device shall be capable of transmitting an alarm to a receiving station, located within the building, that is constantly attended when the assembly occupancy is occupied.
- **Notification.** The required fire alarm system shall activate an audible and visible alarm in a constantly attended receiving station within the building when occupied for purposes of initiating emergency action.
- Occupant notification shall be by means of voice announcements, initiated by the person in the constantly attended receiving station.
- Occupant notification shall be by means of visible signals, initiated by the person in the constantly attended receiving station.



Assembly Flame Retardant

- **Flame-Retardant Requirements.**
- Combustible scenery of cloth, film, vegetation (dry), and similar materials shall comply with one of the following:
 - (1) They shall meet the flame propagation performance criteria contained in NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*.
 - (2) They shall exhibit a heat release rate not exceeding 100 kW when tested in accordance with NFPA 289, *Standard Method of Fire Test for Individual Fuel Packages*, using the 20 kW ignition source.

Assembly Emergency Plans

- **Emergency Plan.**
- **Where Required.** Emergency plans shall be provided as follows:
 - (1) Where required by the provisions of Chapters 11 through 42
 - (2) Where required by action of the authority having jurisdiction
- Emergency plans shall include the following:
 - (1) Procedures for reporting of emergencies
 - (2) Occupant and staff response to emergencies
 - (3) Evacuation procedures appropriate to the building, its occupancy, emergencies, and hazards (see Section 4.3)
 - (4) Use of elevators
 - (5) Design and conduct of fire drills
 - (6) Type and coverage of building fire protection systems
 - (7) Other items required by the authority having jurisdiction
- Required emergency plans shall be submitted to the authority having jurisdiction for review.

Special Amusement Buildings

- **General.** Special amusement buildings, regardless of occupant load, shall meet the requirements for assembly occupancies in addition to the requirements of 12.4.7, unless the special amusement building is a multilevel play structure that is not more than 10 ft (3050 mm) in height and has aggregate horizontal projections not exceeding 160 ft² (15 m²).
- **Automatic Sprinklers.** Every special amusement building, other than buildings or structures not exceeding 10 ft (3050mm) in height and not exceeding 160 ft² (15m²) in aggregate horizontal projection, shall be protected throughout by an approved, supervised automatic sprinkler system installed and maintained in accordance with Section 9.7.

Special Amusement Buildings

- **Temporary Water Supply.** Where the special amusement building required to be sprinklered by 12.4.7.2 is movable or portable, the sprinkler water supply shall be permitted to be provided by an approved temporary means.
- **Smoke Detection.** Where the nature of the special amusement building is such that it operates in reduced lighting levels, the building shall be protected throughout by an approved automatic smoke detection system in accordance with Section 9.6.
- **Alarm Initiation.** Actuation of any smoke detection system device shall sound an alarm at a constantly attended location on the premises.

Special Amusement Buildings

- **Illumination.** Actuation of the automatic sprinkler system, or any other suppression system, or actuation of a smoke detection system having an approved verification or cross-zoning operation capability shall provide for both of the following:
 - (1) Increase in illumination in the means of egress to that required by Section 7.8
 - (2) Termination of any conflicting or confusing sounds and visuals
- **Exit Marking.**
- Exit marking shall be in accordance with Section 7.10.
- Floor proximity exit signs shall be provided in accordance with 7.10.1.6.
- In special amusement buildings where mazes, mirrors, or other designs are used to confound the egress path, approved directional exit marking that becomes apparent in an emergency shall be provided.

Floor Proximity Exit Marking

- **7.10.1.6* Floor Proximity Exit Signs.** Where floor proximity exit signs are required in Chapters 11 through 43, such signs shall comply with 7.10.3, 7.10.4, 7.10.5, and 7.10.6 for externally illuminated signs and 7.10.7 for internally illuminated signs. Such signs shall be located near the floor level in addition to those signs required for doors or corridors. The bottom of the sign shall be not less than 6 in. (150 mm), but not more than 18 in. (455 mm), above the floor. For exit doors, the sign shall be mounted on the door or adjacent to the door, with the nearest edge of the sign within 4 in. (100 mm) of the door frame.
- **7.10.2 Directional Signs.**
- **7.10.2.1*** A sign complying with 7.10.3, with a directional indicator showing the direction of travel, shall be placed in every location where the direction of travel to reach the nearest exit is not apparent.

Resources

- National Fire Protection Association
 - www.nfpa.org
- NFPA Fire Journal, September 1985, NFPA Investigation Report, Fire in Haunted Castle Kills Eight
- Ken Berryhill
 - kberryhill@cedarpoint.com
 - 419-627-2355
- Nancy Heard
 - Nheard.inspections@gmail.com
 - 970-379-9704
