

This edition of TechNotes was written by John Swanson, Codes and Standards Specialist for the NFSA.

2024 Codes and Their Standards

Every 3 years, the International Code Council (ICC) and the National Fire Protection Association (NFPA) update their codes and standards so they reflect the most up-to-date procedures, practices and techniques related to the built environment, with the overall goal of improving safety. On one hand, it's important the codes and standards utilized throughout the built environment are updated to ensure they address modern construction techniques and practices. On the other hand, we all know how quickly technology can change. A lot can (and does) change in 3 years.

This Technotes will review some of the significant changes to the model codes and standards that have changed between the 2021 and 2024 editions of the International Building Code (IBC), International Fire Code (IFC), NFPA 1, and NFPA 101, that directly impact the fire sprinkler industry.



2024 International Building Code

You may be thinking, I work as a sprinkler designer, I don't need to know what changed in the IBC or IFC. Here is just one scenario that outlines why changes in the model codes can directly impact the fire sprinkler designer and sprinkler contractors in general. The 2021 IBC and IFC use the term "Condition 1" or "Condition 2" to apply the fire protection requirements based on the occupants' mobility, or lack thereof, and if the occupants need assistance with evacuation. These terms are used in the Group I-1 and Group R-4 occupancy definitions. Condition 2 applies to those occupancies where occupants require "limited verbal or physical assistance while responding to an emergency". However, the code never defined "limited verbal or physical assistance," so it was left up to the design professional and code official to make the determination. The 2024 IBC clarified and added a definition to assist with determining if the occupants need verbal or physical assistance with evacuation. This is important to the sprinkler designer because the Condition 1 or 2 classification can mean the difference between when an NFPA 13R system is *required* and when an NFPA 13D sprinkler system is *permitted*.

High-Rise Buildings

Another important change that occurred in the 2024 IBC was made to high-rise buildings. Design professionals and code officials may already be aware there's an entire section in IBC Chapter 4 dedicated to high-rise buildings (buildings with an occupied floor more than 75 feet above fire department vehicle access). The change to the 2024 IBC says that the "high-rise" designation now also applies where an occupiable roof is located above the 75 foot point. This

change will mean an existing building that under previous codes was not considered a high-rise, can be placed into the high-rise category (IBC Section 403) using the “change of occupancy” provision if the owner repurposes the roof to make it an occupied space and the roof is more than 75 feet above the lowest level of fire department vehicle access.

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Incidental Use Areas and the IBC

Another change in the IBC impacting fire protection is related to the incidental use area provisions in Section 509. An Incidental use area is a room, space or area considered to be an ancillary function associated with an occupancy that poses a higher level of risk to that occupancy. In other words, incidental use areas are a room or space that presents a higher risk in an occupancy. Examples include a furnace room where the furnace exceeds 400,000 Btu's per hour input, or a chemistry lab inside a high school. Historically, the code has required incidental use areas to be fire separated OR protected with fire sprinklers. In some limited situations, the code will require both fire separation and sprinkler protection. The 2024 IBC now requires incidental use areas located in ambulatory care facility to be separated from the rest of the building by a 1-hour fire barrier and protected with fire sprinklers. It's important to clarify that ambulatory care facilities include buildings used for medical, surgical, psychiatric, nursing or similar purposes on less than a 24-hour basis where the persons are rendered incapable of self-preservation. In other words, the occupant(s) need assistance evacuating. These occupancies do not include the standard doctors or dentist offices. However, it will likely include day surgery centers where occupants are placed under general anesthesia.

2024 International Fire Code Lithium-ion Batteries

Several changes were made in the 2024 IBC and IFC specific to the use and storage of lithium-ion batteries, including equipment utilizing lithium-ion batteries. In previous editions of the IFC, sprinkler protection was required when the lithium-ion batteries were used with an energy storage system. Now, fire sprinklers are required for Group B, F-1, M and S-1 that use or store these batteries, regardless of whether they are used in conjunction with an energy storage system or not. Examples include testing, research and development of batteries, manufacture of batteries, storage and/or sale, just to name a few. The issue of how to properly protect lithium-ion batteries using fire sprinklers will need to be addressed in another TechNotes article.

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The IBC and NFPA 13R Sprinkler Systems

Another significant change was made to the 2024 IBC and IFC relating to NFPA 13R sprinkler systems; specifically, when they are permitted based on the height of the building. Since the 2015 IBC, the codes have contained parameters for when NFPA

13R can be used, primarily dealing with podium-style buildings. The 2021 IFC allowed NFPA 13R sprinkler systems when all the following conditions were met:

1. Four-stories or less above grade plane.
2. The floor level of the highest story is 30 feet or less above the lowest level of fire department vehicle access.
3. The floor level of the lowest story is 30 feet or less below the lowest level of fire department vehicle access.

However, there was an inadvertent mistake made when this section was changed between the 2018 and 2021 editions of the IBC and IFC. The problem with this revision is condition #2 limits most residential buildings protected with an NFPA 13R system to no more than three-stories in height. The intent has always been to allow NFPA 13R up to, and including, four-stories. Another important change that occurred in the 2021 editions clarified the number of stories of Group R occupancy must be measured from grade plane. Previous editions allowed the number of stories to be measured from the horizontal assembly creating the occupancy separation. NFSA's codes and standards team submitted a code change for the 2024 IBC that was approved to modify Section 903.3.1.2 again and increase the 30 feet requirement to 45 feet for Group R-2 occupancies. It's important to clarify that this change only applies to Group R-2 occupancies (not Group R-1). According to feedback NFSA received from contractors, developers, and design professionals, the 30 feet requirement that was added to the 2021 IBC limits residential buildings on top of podiums, but also affects standalone R-2 multi-family occupancies. The 2024 change will allow NFPA 13R for four-story buildings. Based on typical floor ceiling assemblies and ceiling heights found in apartment buildings, the 30 feet requirement inadvertently limited NFPA 13R systems to three-stories, which was not the intent.



Floor Level Exit Signs

Another change that primarily will apply to authorities having jurisdiction (AHJ) applies to floor level EXIT signs in Group R-1 (hotel/motel) occupancies. The 2024 IBC includes an exception for the elimination of floor level EXIT signs when the building is protected throughout with an NFPA 13 or NFPA 13R sprinkler system.

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Spray Finishing Applications and Fire Protection

The IFC has contained fire protection requirements for spraying of flammable finishes (spray booths, rooms, etc.) for years. NFPA 13 and NFPA 33 contain installation requirements for sprinklers protecting ducts exhausting the flammable vapors from these spaces. But as was mentioned in the first part of this article, codes and standards must be updated so they reflect, and adequately address, new hazards that are introduced in the built environment. Over the past few years, inflatable and portable enclosures used for spraying flammable finishes have become available on the market. The problem with these spray enclosures is they often do not meet the criteria found in Chapter 24 of the IFC. The IFC and NFPA 33 require spray enclosures used for the application for flammable finishes to be noncombustible or limited combustible and equipped with fire protection in the spraying space and the exhaust duct. Inflatable spray enclosures often do not meet this requirement.

NFPA 1 – Fire Code



NFPA 1 also made several changes to the 2024 edition impacting the sprinkler industry and authorities having jurisdiction.

A new section was added to NFPA 1 allowing code related inspections for fire protection systems and equipment to be modified or delayed when approved by the authority having jurisdiction due to national, regional, or locally declared disasters.

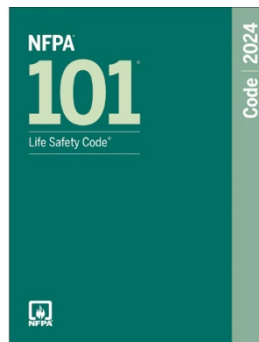
The use of cooking equipment on decks and balconies of multi-family dwellings has been modified and reformatted. A new section was added allowing cooking appliances on decks and balconies when protected with a sprinkler system complying with NFPA 13 or NFPA 13R and sprinkler protection is provided on the balconies and any overhanging structures. Cooking appliances are also permitted on decks and balconies of residential occupancies constructed of Type I or II construction when the appliance(s) are listed and labeled in accordance with UL 1026. The 2024 edition also clarified that a minimum clearance of 24 inches must be provided and maintained from the building and combustible materials.

Section 13.1.9 was reformatted to clarify that when impairments, critical deficiencies, or non-critical deficiencies are identified during maintenance of a fire protection system, the impairment(s) or deficiencies shall be corrected or repaired in a timeframe acceptable to the AHJ, and until impairments or deficiencies are addressed, an impairment plan or deficiency program must be implemented.

New language was added to clarify that private fire service mains must be inspected, tested, and maintained in accordance with NFPA 25. Previous editions of NFPA 1 simply required fire service mains to be “maintained”.



NFPA 101 – Life Safety Code



NFPA 101 -Life Safety Code added new criteria for “alternate care sites”. During the pandemic, a need arose for temporary medical clinics and/or care sites at locations not typically used for medical care. An example would be an arena converted for temporary use as a medical facility or hospital. Alternate care sites are now defined as:

Any building, structure, or portion thereof not currently being used for health care that is temporarily reoccupied, converted, constructed, or relocated for health care use during an urgent need in capacity to provide additional capability for an affected community.

Lastly, NFPA 101 requires all new parking structures to be protected with an automatic sprinkler system, regardless of the square footage or number of stories. Many vehicles today are made of plastic materials and include products such as lithium-ion batteries, which presents more of a challenge to responding firefighters. This is also why the 2022 edition of NFPA 13 moved automobile parking garages from the ordinary hazard group 1 classification to ordinary hazard group 2.

Hopefully this article has provided you with some of the significant changes to the codes that directly impact fire sprinkler designers, contractors and authorities having jurisdiction. Some of these changes won't directly impact fire sprinkler designers or contractors, but nearly all the changes mentioned here will impact authorities having jurisdiction that are

responsible for applying, interpreting, and enforcing the requirements in their respective communities. If you feel overwhelmed with all the changes that occur between the different codes and standards, you're not alone. But don't worry, NFSA's code development team is dedicated to staying up to date on these changes so you can do your job more effectively.

Training and Education



Sign-Up for one of our Layout Technician Pathway Courses

NFSA's newly updated fire sprinkler Layout Technician Pathway (LTP) prepares fire sprinkler layout and design professionals for NICET Levels I & II certifications. It also provides a great refresher for those who have been designing systems but need a comprehensive refresher. Students will receive a hard copy of the recently updated and revised "Layout Book" as well as a copy of the 2022 edition of the NFPA 13 standard.

The LTP consists of two parts. Students must first complete the on-line Part 1: Fundamentals before attending the in-person Part 2: Application session. The 25 self-paced online modules cover everything from "Parts of a Sprinkler" to "Introduction to Fire Sprinkler Calculations." The 3-day in-person instructor-led Part 2: Application class applies the content learned in the previous Fundamentals course. There are four in-person and one virtual session offered in 2023.

NOTE: Students must register for Part 1: Application at least one month before the start of in-person Part 2: session in order to allow enough time to complete the on-line modules.

Layout Technician Pathway cost:

Members: \$2,200.00

Non-members: \$4,400.00 – [Join here](#) to save 50%!

Registration Deadline for Fundamental & Application	Layout Technician: Fundamentals Completion Deadline	Layout Technician: Application Class Dates	Location
2-Jan-24	29-Jan-24	January 30-February 1, 2024	FL
20-Feb-24	18-Mar-24	March 19-21, 2024	Online

[Check Out All Options](#)

Join us for our next Tech Tuesday!

Our next Tech Tuesday will be December 19, 2023, from 12:30 pm to 1:30 pm eastern time. The topic will be 2024 Codes and Their Standards.

This course will provide attendees with the updates to the 2024 editions of the International Building Code, International Fire Code, NFPA 1 Fire Code, and NFPA 101 Life Safety Code. Updates to the referenced standards will also be addressed.

Member Cost: Free

Non-member Cost: \$50.00 [Learn more about membership.](#)

*** As of October 2023, NFSA has transitioned back to Microsoft Teams using the Webinar client to deliver Tech Tuesdays.

With this process, once you have registered for the event you be sent an email with a Microsoft link that will bring you to the Microsoft Teams Event registration page. You must provide simple identifying information here to generate your email with the "Join" link to the Webinar.

We must be able to identify each participant as accessing, being present, engaging, and evaluating the course to issue a CEU Certificate.

Thank you for your patience, we will continue to improve the user experience as we continue this transition back to Microsoft Teams. Your feedback is always welcome!

[Register for the next Tech Tuesday Here](#)

National Fire Sprinkler Association

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