

CONSTRUCTION SITE FIRE SAFETY - NFPA 241

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Outline

- ✧ Fires in structures under construction - follow the data
- ✧ What is NFPA 241? - Scope, Purpose, and Application
- ✧ Fire Prevention Program
- ✧ Fire Prevention Program Manager (FPPM)
- ✧ NFPA 241 - overview
- ✧ Summary and Closing

Objectives

- ✧ Describe risk factors for buildings under construction
- ✧ Describe scope, application, and purpose of NFPA 241
- ✧ List elements of a Fire Prevention Program
- ✧ List duties of Fire Prevention Program Manager (FPPM)
- ✧ List key areas covered by NFPA 241

Fires in Structures under Construction

- ✧ Fire departments respond to average of 4300 fires
 - ✧ Number increased since 2014
 - ✧ 3 of every 4 fires involved residential properties
 - ✧ Cooking equipment is leading cause
- ✧ Factors contributing to the ignition of fires - heat sources too close to combustibles, abandoned or discarded materials, electrical failures or malfunctions



Risk Factors for Fires in Construction

- ✦ Buildings under construction might not have all the fire protection systems
- ✦ Construction sites often unsecured and vulnerable to trespassing and vandalism, theft, and intentionally set fires
- ✦ Potential ignition sources

Maine Requirements

- ✧ Maine Fire Code, 2018 (incorporates NFPA 1 2018 with amendments)
 - ✧ Chapter 16, Safeguarding Construction, Alteration, and Demolition Operations
- ✧ Rules of the State Fire Marshal, Chapter 20, “Fire Safety in Buildings and Structures, 2019”
 - ✧ Includes 2019 edition of NFPA 241

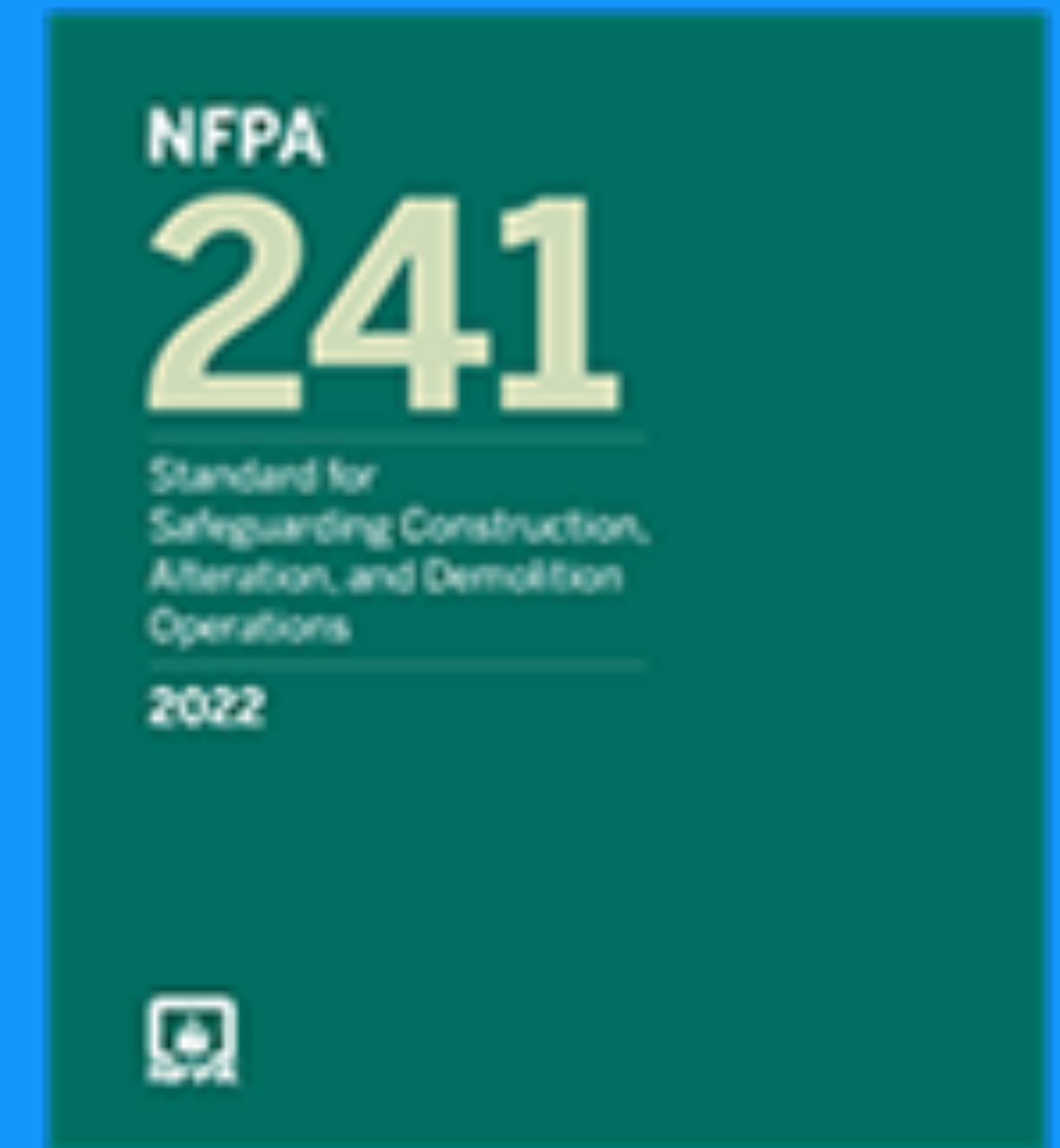
NFPA 241 Organization

- ✦ Chapters 1 - 3 Fundamentals
- ✦ Chapter 4 - General Requirements
- ✦ Chapter 5 - Temporary Construction, Equipment and Storage
- ✦ Chapter 6 - Utilities
- ✦ Chapter 7 - Processes and Hazards



NFPA 241 Organization

- ✦ Chapters 8 - Construction and Alteration
- ✦ Chapter 9 - Demolition
- ✦ Chapter 10 - Roofing
- ✦ Chapter 11 - Underground
- ✦ Chapter 12 - Construction for Tall Mass Timber Wood Structures
- ✦ Chapter 13 - Construction for Large Wood Frame Structures

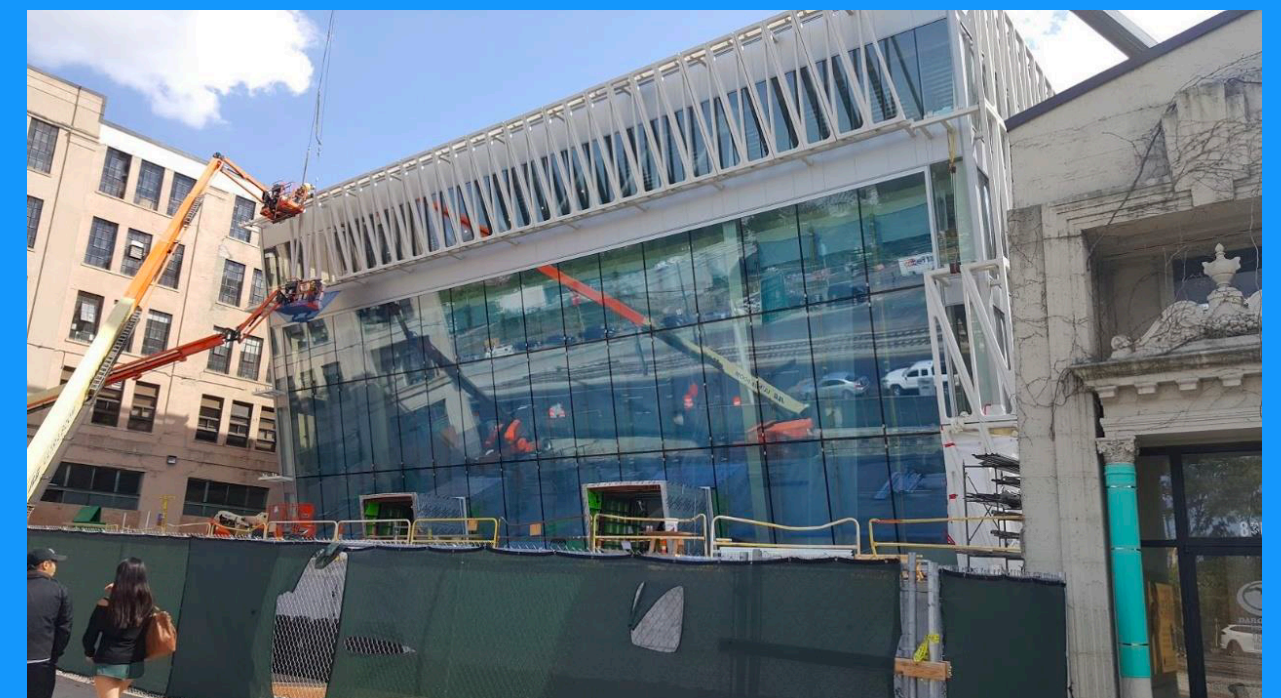


Chapter 4 - General Requirements

- ✧ Owner's responsibility for fire protection
 - ✧ Designate a Fire Prevention Program Manager
 - ✧ FPPM ensure personnel aware of fire prevention program
- ✧ Pre-incident plans
- ✧ Site security

Chapter 4 - Pre-Incident Plans and Site Security

- ✧ Pre-incident plans
 - ✧ FPPM responsible for developing pre-incident plans
 - ✧ Updated as necessary and coordinate on-site visits
- ✧ Site security
 - ✧ Buildings > 40 ft above grade with combustible construction must have guard service per AHJ requirement
 - ✧ Guard service training



Fire Prevention Program Manager (FPPM)

- ✦ Competent person knowledgeable of standards, systems, and procedures
- ✦ Enforce NFPA 241 and other applicable fire protection standards
- ✦ Consult with registered design professional where temporary systems used
- ✦ Conduct daily inspections and correct deficiencies and hazards without delay
- ✦ Made aware of all fires in accordance with the fire safety plan
- ✦ Responsible for the guard service where provided
- ✦ Supervise the permit system for hot work operations

Fire Prevention Program (part 1)

- ✧ Pre-incident plan in accordance with NFPA 1620
- ✧ Emergency contacts, emergency communications, personnel responsibilities during an incident, emergency evacuation procedures
- ✧ Hot work operations
- ✧ Fire protection systems based on type of operations
- ✧ Good housekeeping and waste disposal



Fire Fighter Safety Building Marking System (FFSBMS)



Fire Prevention Program (part 2)

- ✧ On-site security
- ✧ Special hazards
- ✧ Protecting existing structures from exposure fires
- ✧ Documentation of inspections, tests, training, and drills
- ✧ Life safety plan
- ✧ Temporary utilities

Fire Protection

- ✧ Sprinkler protection
 - ✧ Those systems temporarily placed into service NOT required to comply with NFPA standards
 - ✧ Installation details per Fire Prevention Program
- ✧ Fire pumps
 - ✧ Permitted to be permanent pumps or temporary pumps for temporary fire protection

Processes and Hazards

- ✧ Hot work
- ✧ Thermit welding
- ✧ Heating and cooling equipment
- ✧ Smoking
- ✧ Waste disposal
- ✧ Construction equipment and material storage
- ✧ Scaffolding, shoring, and forms
- ✧ Flammable and combustible liquids and flammable gases
- ✧ Explosives
- ✧ Cooking



Under Construction - Virginia

- ❖ Five-story, multi-property building with both retail and residential; 50% completed
- ❖ No automatic detection or suppression systems present
- ❖ Fire started in clogged rubbish chute between 2nd and 3rd floors; smoking material discarded into rubbish
- ❖ Strong winds caused rapid growth of fire and spread to adjacent exposed structures



Discussion

- ✦ What safety protocols exist that, if applied, could prevent occurrence of construction site fires?
- ✦ Ensure proper installation, inspection, and maintenance of temporary electrical service lighting
- ✦ Prohibit use of temporary cooking equipment
- ✦ Manage placement and use of temporary heaters
- ✦ Enforce hot work permit system requirements and practices
- ✦ Establish effective site security measures
- ✦ Fire Prevention Program and Fire Prevention Program Manager (FPPM)

Existing Conditions to Consider

Existing Conditions	Questions to Ask	Where to look in NFPA 241 (2022)
Temporary offices and sheds	Proper separation from other structures	Section 5.2
Waste disposal	Has waste been removed? If on site, where is it stored?	Section 7.5
Storage of ignitable liquids and flammable gases	Have materials been removed? AHJ requirements for on-site storage	Section 7.8
Command posts	Is command post set up? Is key box required?	4.12.1, 4.12.2
Access roadways	Access roadways clear and unobstructed? Surfaces suitable for fire apparatus?	4.12.3
Standpipes	Where required, what is condition of standpipes on-site?	Section 4.7

NFPA Fire & Life Safety Ecosystem

- NFPA Fire & Life Safety Ecosystem
 - Government responsibility
 - Codes and standards: primary and reference standards
 - Investment in safety
 - Skilled workforce
 - Code compliance
 - Preparedness and emergency response
 - Informed public



Closing and Questions

- ✦ Outlined and described risk factors for buildings under construction
- ✦ Listed the scope, application, and purpose of NFPA 241
- ✦ Outlined and described elements of Fire Prevention Program
- ✦ Outlined the duties of the Fire Prevention Program Manager
- ✦ Listed and discussed key provisions in NFPA 241, focusing on Chapter 4
- ✦ Used a case study to highlight the risk factors and illustrate NFPA 241 application
- ✦ Questions?

NFPA Resources

- ✧ NFPA 241 Document Information Page
 - ✧ www.nfpa.org/241
- ✧ Go to “NEWS” tab
 - ✧ Fact sheets and data analysis report
- ✧ Also “TRAINING” tab
- ✧ Also “Free Access” for read only

Thank you

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