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NC DEPARTMENT OF INSURANCE



Fire Code – Common Violations

Why Fire Codes Matter

Purpose of Awareness: Understanding code violations prevents catastrophic loss of life, property damage, and significant operational downtime.

Regulatory Framework: In North Carolina, fire codes are enforced locally by the Fire Marshal's office, primarily adopting the International Fire Code (IFC) with specific NC amendments.

The Bottom Line: Proactive compliance is essential for effective risk mitigation and premium rates.

Resource Link: Access the NC Building and Fire Codes
ncosfm.gov



Fire Code – Common Violations



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Navigating NC Fire Codes: Key Violations & Risk Mitigation

Exit Pathways & Storage in Exit Pathways

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On March 25, 1911, at 4.40pm a fire broke out on the eighth floor of the Triangle Shirtwaist Factory in Greenwich Village, NY

First Thing First: Getting Out of The Building

Means of Egress - Reliability

Section 1031.2 Required exit accesses, exits or exit discharges shall be continuously maintained free from obstructions or impediments to full instant use in the case of fire or other emergency when the areas served by such exits are occupied.

Security devices affecting means of egress shall be subject to approval of the fire code official.



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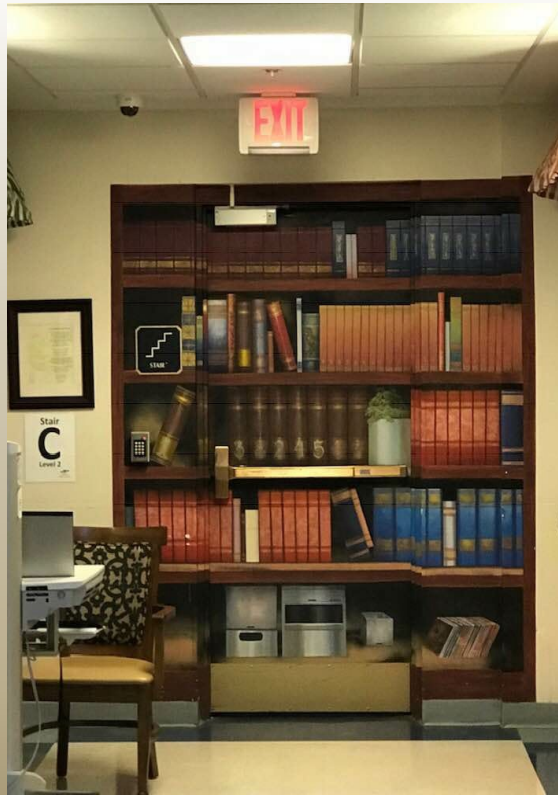


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NCFC 1010.1 Doors

Means of egress doors shall be readily distinguishable from the adjacent construction and finishes such that the doors are easily recognizable as doors. Mirrors or similar reflecting materials shall not be used on means of egress doors. Means of egress doors shall not be concealed by curtains, drapes, decorations or similar materials.



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Combustible Materials Storage:

NCFC: 315.3.2 Means of egress

Combustible materials shall not be stored in exits or exit enclosures (Stairwells, passageways, etc.)



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Combustible Materials Storage:



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NCFC: 315.3.3 Equipment rooms:

Combustible material shall not be stored in boiler rooms, mechanical rooms or electrical equipment rooms or in fire command centers as specified in Section 508.1.5.



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Electrical and Mechanical equipment rooms shall not be used for storage (especially of combustible materials). NCFC 315.3.3.



NOTICE
**MECHANICAL
ROOM
NO STORAGE**

CAUTION
**ELECTRICAL
ROOM**
NO STORAGE PERMITTED



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Navigating NC Fire Codes: Key Violations & Risk Mitigation

Fire Alarm Control Panel

**Non-Working or Impaired Sprinkler
Systems**

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FIRE ALARM

- Provide a handle lock on the circuit breaker for the 120-vac branch circuit to the fire alarm control panel to prevent the power from being accidentally turned off, since the breaker is not in a locked, emergency-only panelboard. The circuit disconnecting means shall have a red identification and identified as (FIRE ALARM CIRCUIT) Per NEC 760.41





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Provide a copy of the annual NFPA 25 certification paperwork for the Fire Sprinkler system by a NC Licensed 3rd party vendor. NCFC 901.6 & NFPA 25

Provide an FDC (Fire Department Connection) signage (6-inch red letters on white metal sign) at connection pipe at rear of building. NCFC 912

Provide protection caps on the FDC (Fire Department Connection) hose connections to prevent damage and obstructions. NFPA 13 & 25



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Rooms containing electrical, mechanical, fire protection equipment or systems shall be identified for use. NCFC 509

Sign, sign everywhere a sign...



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Fire Sprinkler Riser with Inspection Tag



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Painted sprinkler heads and detectors.

NFPA 25: 5.2.1.1.1 Any sprinkler that shows signs of paint other than applied by the sprinkler manufacture shall be replaced.

Sprinkler heads require cleaning per NFPA 25, 5.2.1.1.1. Any amount of loading (dust, grease) can have an impact on the thermal sensitivity.



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Key NC Fire Code Clearance Rules

The 18-Inch Rule (Sprinklered Areas):

A minimum of 18 inches of vertical clearance must be maintained between the top of any storage and the deflector of the sprinkler heads.

This is treated as an imaginary horizontal plane throughout the room; nothing should penetrate this plane (except shelving along a wall, in some cases).

The 24-Inch Rule (Non-Sprinklered Areas):

A minimum of 24 inches of vertical clearance must be maintained below the ceiling in areas without sprinklers.

This space allows the Fire Department to direct water over storage and helps minimize rapid horizontal fire spread.

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Post Indicator Valve with Position Switch and Lock.

PIV not electrically supervised requires a lock to secure in open position.

Inspection, testing and maintenance. NCFC 912.7



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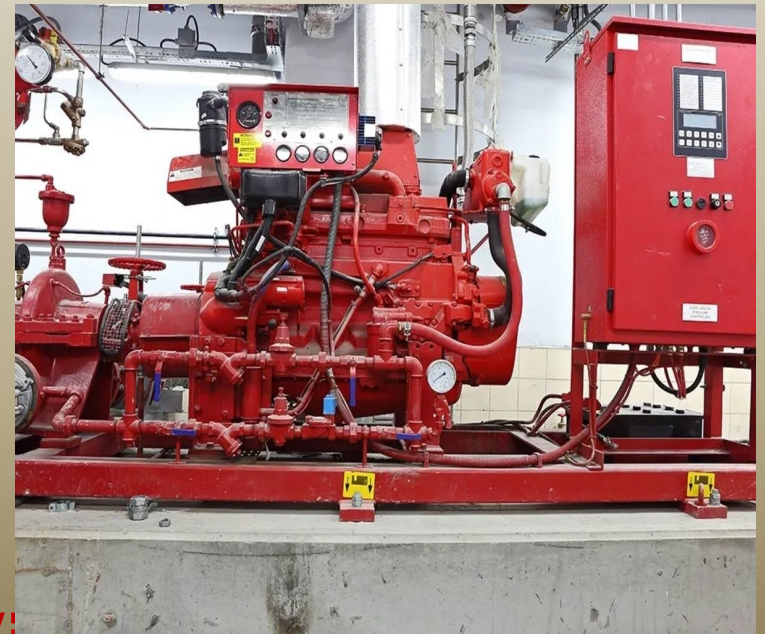
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NCFC 913.5

Testing and Maintenance

Fire pumps shall be inspected, tested and maintained in accordance with the requirements of this section and NFPA 25. Records of inspection, testing and maintenance shall be maintained.

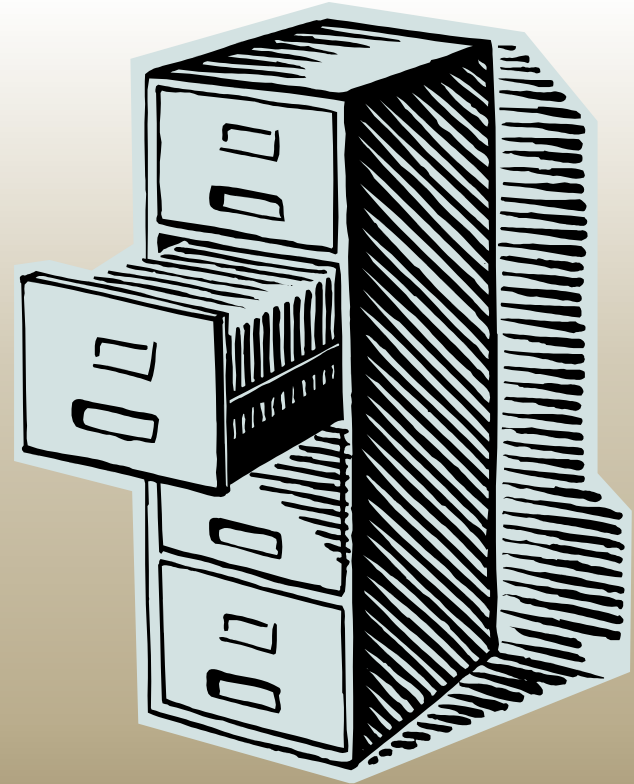


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All inspection/testing records **shall** be maintained on premises for a minimum of 3 years.



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Navigating NC Fire Codes: Key Violations & Risk Mitigation

Kitchen Fire Suppression Systems

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Commercial Kitchen Suppression Systems

The Code Requirement: Systems protecting commercial cooking equipment (hoods, ducts, ranges) must adhere to NFPA 96 and NFPA 17A standards.

Risk Manager Focus:

Frequent Servicing: These systems require mandatory inspection and servicing every six months by a qualified professional. (May be more often depends on type of cooking operation)

Automatic Shutoffs: Verify that the system automatically cuts off power and fuel sources to the cooking appliances when activated.

Accessible Pull Stations: Ensure manual activation pull stations are unobstructed, clearly marked, and mounted correctly (between 42" and 48" above the floor).

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Commercial Hood Cleaning



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Kitchen Hood Fire



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Fire Suppression Pull Station

A manual actuation device shall be located at or near a means of egress from the cooking area not less than 10 feet (3048 mm) and not more than 20 feet (6096 mm) from the kitchen exhaust system.

NCFC 904.12.1



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Suppression System Activation

System Interconnection

The actuation of the fire extinguishing system shall automatically shut down the fuel or electrical power supply to the cooking equipment. The fuel and electrical supply reset shall be manual.

NCFC 904.12.2



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904.12.5 Portable Fire Extinguishers for Commercial Cooking Equipment

Portable fire extinguishers shall be provided within a 30-foot (9144 mm) distance of travel from commercial-type cooking equipment. Cooking equipment involving solid fuels or vegetable or animal oils and fats shall be protected by a Class K rated portable extinguisher in accordance with Section 904.12.5.1 or 904.12.5.2, as applicable.

The use of multi-purpose dry chemical (Class A:B:C) units on a grease fire will neutralize the hood fire suppression system discharge, rendering it ineffective. Refer to NFPA 10 and NCMC 507.



Class K



ABC

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Navigating NC Fire Codes: Key Violations & Risk Mitigation

Electrical Equipment, Wiring and Hazards

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Electrical Code Violations & Fire Risk

The Code Requirement: Electrical systems must be installed and maintained per the NC Electrical Code (NFPA 70) to prevent shock and ignition sources.

Risk Manager Focus:

Obstructed Panels: Maintain a mandatory 30-inch clearance in front of all electrical panels for emergency access and maintenance.

Extension Cord Misuse: Cords are temporary solutions only.

Violation: Using extension cords as permanent wiring (running under rugs, through walls, affixed to structures).

Solution: Use surge protectors or request permanent outlet installations.

Damaged Equipment: Immediately remove and replace frayed wires, cracked outlets, or damaged power strips.

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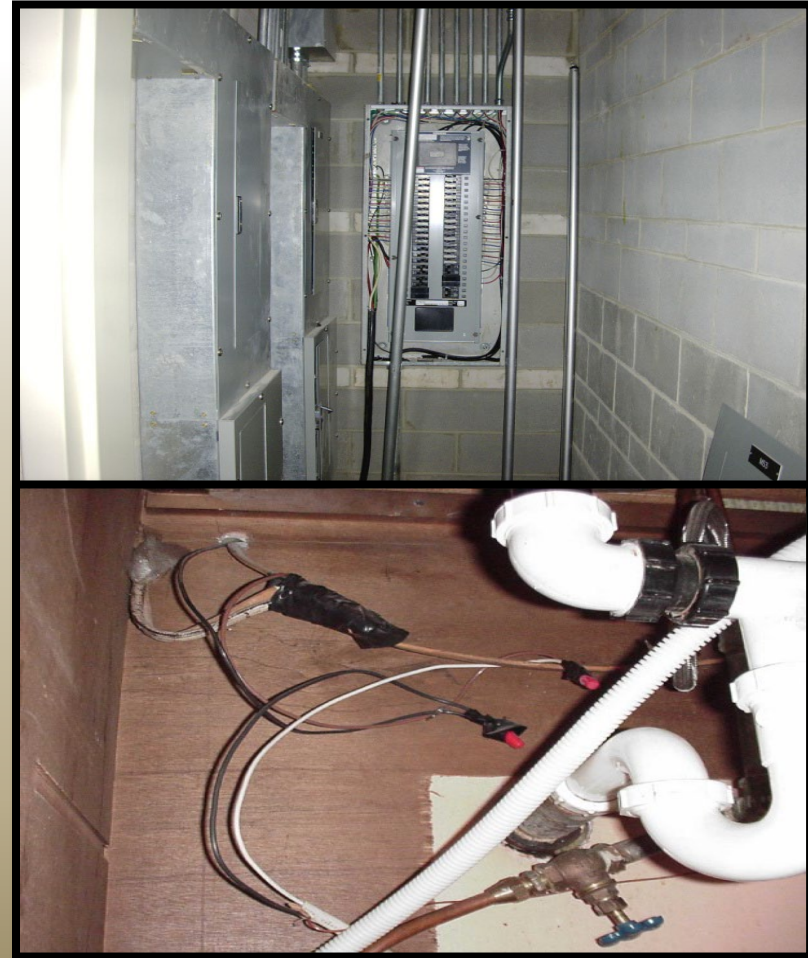
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NCFC 605.1 Abatement of Electrical Hazards

Identified electrical
hazards shall be abated.

Hazardous conditions in
permanent wiring shall be
referred to electrical
inspector.

Modified or damaged
wiring, devices or
appliances that create
shock or fire hazard shall
not be used.



Fire Code – Common Violations



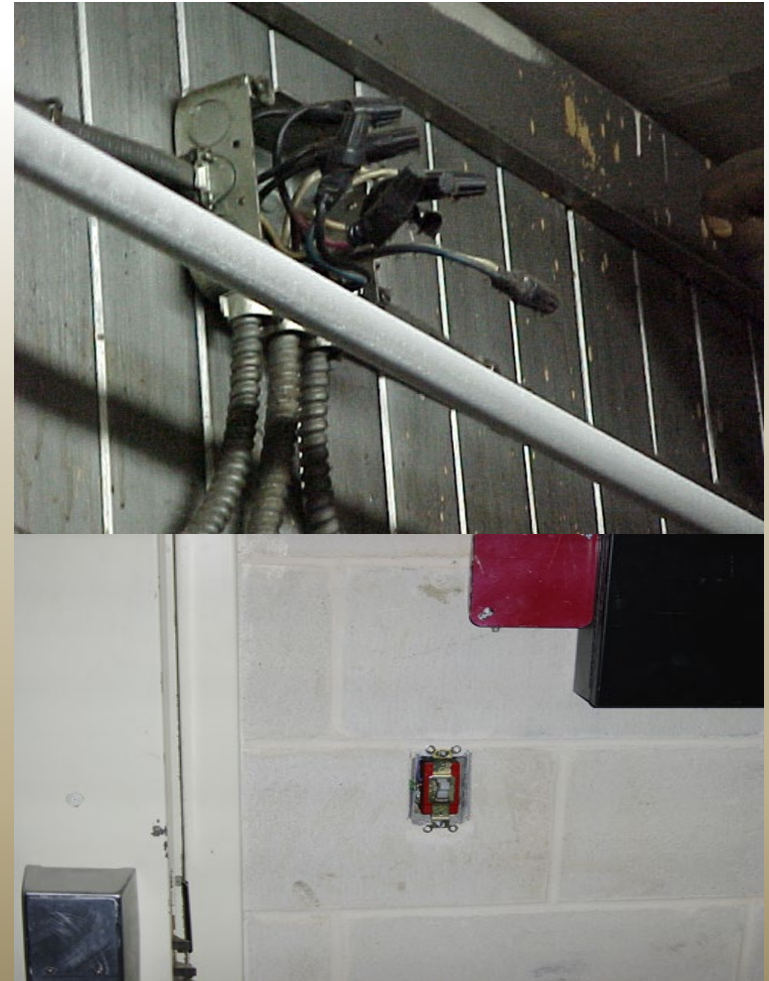
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NCFC 605.6 Unapproved conditions

Open junction boxes and open-wiring splices shall be prohibited.

Approved covers shall be provided for all switch and electrical outlet boxes.



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Blocked Electrical Panels

The Code Requirement: A clear, safe working space must be always maintained around all electrical service equipment. This is crucial for emergency access and safe maintenance.

Specific Dimensions: NCFC 605.3

Width: Minimum of 30 inches, or the width of the equipment, whichever is greater.

Depth: Minimum of 36 inches deep in front of the panel.

Height: Minimum of 78 inches (6.5 feet) of vertical clearance.

Violation Risk: Storage of materials or permanent architectural features within this space is a common, citable violation and a major safety risk.

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Is there adequate clearance provided around these panels?



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Provide a circuit directory to identify all circuits and switches in the electrical panel board or switchgear. NEC 408.4

The Code requires at least three feet of clearance to be continuously maintained around all electrical panelboards, for maintenance purposes and to allow rapid access to the disconnects in an emergency. NEC & NCFC 605.3.



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Damaged or Modified Equipment

The Code Requirement: Electrical wiring, devices, appliances, and other equipment that is modified or damaged and constitutes an electrical shock or fire hazard shall not be used until properly repaired or replaced.

Risk Manager Focus:

Reporting: Encourage immediate reporting of frayed wires, cracked plugs, or malfunctioning equipment.

DIY Hazards: Only qualified personnel should perform work on or near energized electrical equipment.

Marking and Listing: All equipment must be listed, labeled, and used according to the manufacturer's instructions to meet code.

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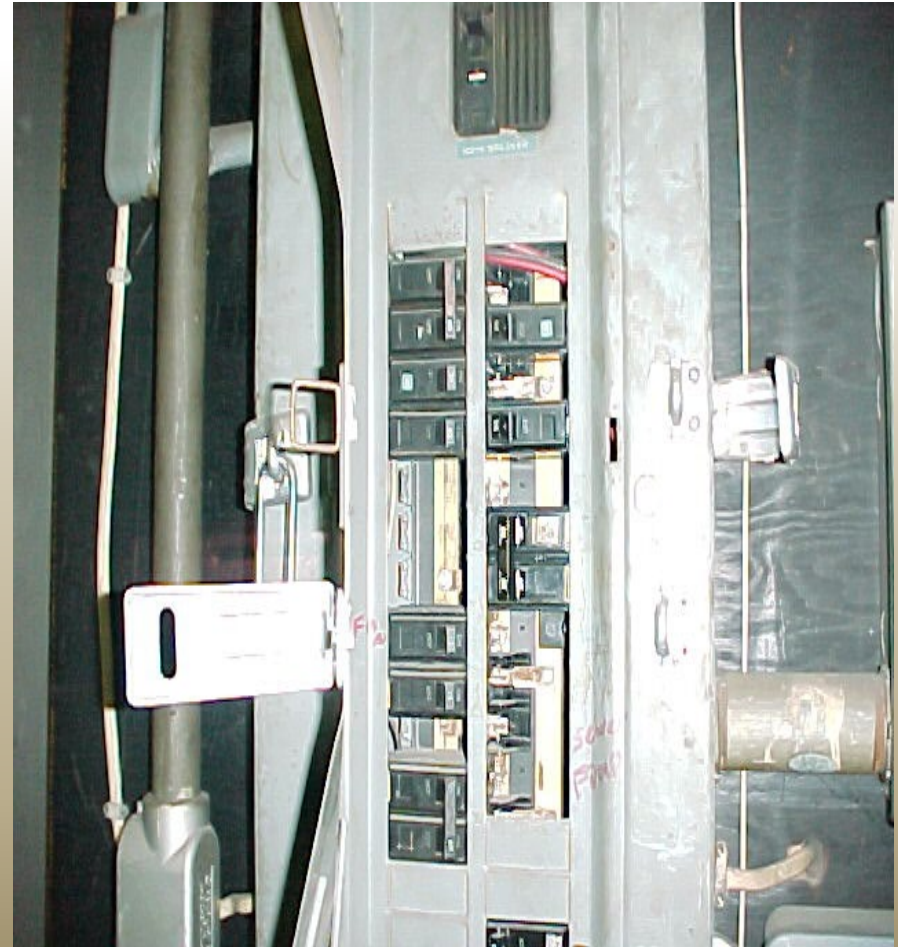
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Damaged or Modified Equipment.

Added hasp or bolt lock.

When looking at the electrical panel, make sure all breakers are in place. If breakers are missing, breaker blanks are required to be installed. This panel is missing 10 breakers. NCEC 110.27



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Misuse of Extension Cords NCFC 605.5

The Code Requirement: Extension cords are strictly for temporary use with portable appliances only, not as a substitute for permanent wiring.

Common Violations & Hazards:

Permanent Wiring Substitute: Using cords long-term to power permanent fixtures or multiple items.

Improper Routing: Running cords through walls, ceilings, floors, under doors, or beneath floor coverings is strictly prohibited.

Damage/Wear: Using cords that are spliced, deteriorated, or damaged is a fire and shock hazard.

Overloading: Cords must not be overloaded beyond their current capacity rating.



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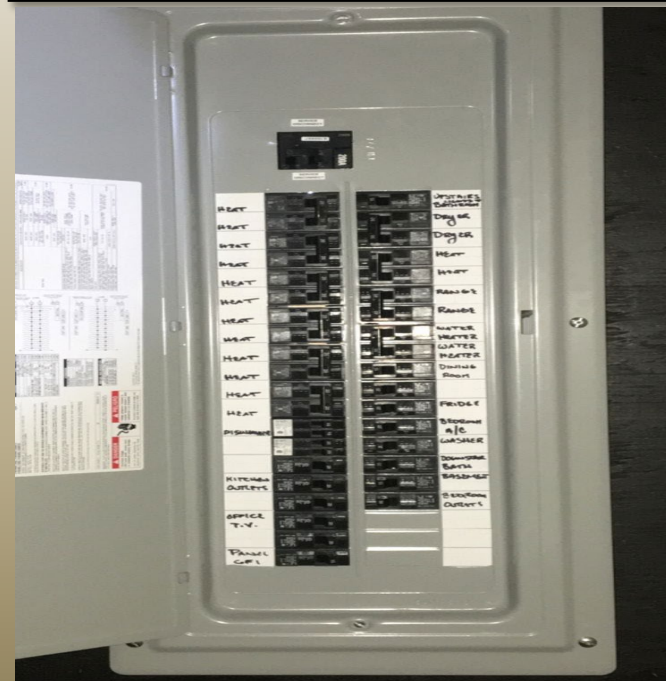
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605.3.1 Labeling:

Doors into electrical control panel rooms shall be marked with a plainly visible and legible sign stating **ELECTRICAL ROOM** or similar approved wording.

The disconnecting means for each service, feeder or branch circuit originating on a switchboard or panel board shall be legibly and durably marked to indicate its purpose unless such purpose is clearly evident.



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Navigating NC Fire Codes: Key Violations & Risk Mitigation

Fire Rated Construction

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Common Code Violations

Unauthorized Penetrations: The most frequent violation involves cutting holes or openings through fire-rated walls or floors for new wiring, plumbing, or data cables without properly sealing the penetration.

Unsealed Openings: Gaps around pipes, cables, or ductwork allow fire and toxic smoke to pass through rapidly.

Missing Firestopping: Failure to install approved firestopping materials (sealants, collars, wraps) where necessary to restore the rating of the barrier.

Propped Open Doors: Fire doors are part of the rated assembly; propping them open nullifies their protective function immediately.



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Which fire damper is code compliant?



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The Major Hazards & Risks

Rapid Fire Spread: A single unsealed 4-inch hole in a fire wall can allow a fire to breach a barrier in minutes, completely circumventing the building's compartmentalization strategy.

Smoke Migration: Smoke and toxic gases spread faster than fire and will travel through any opening, posing an immediate and severe threat to life safety throughout the building.

Life Safety Threat: Reduces the amount of time occupants have to evacuate and impacts the areas designated as safe "areas of refuge."

Increased Property Damage: Allows fire to spread beyond the area of origin quickly, leading to greater loss.

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Section 703.5 Identification.

Walls and partitions required to have protected openings shall be identified above ceiling and in concealed spaces.



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Permanent doorstop is not permitted on rated doors.



Fire Doors - what can go wrong?



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- All Fire Rated horizontal and vertical sliding, rolling, and swinging doors and dampers shall be inspected annually to confirm operation and full closure. Provide records of inspections and testing. NCFC 703 & NFPA 80

Do the auto-closures work properly?

When the door closes, does the door latch securely?

Has the door been cut? Has anything been attached, nailed, screwed, etc. to the door?

Has the label been painted over?

Wooden/plastic wedges NOT ALLOWED!!



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703.2.2 Hold-Open Devices and Closers

Hold-open devices and automatic door closers, where provided, shall be maintained. During the period that such device is out of service for repairs, the door it operates shall remain in the closed position.

703.2.3 Door Operation

Swinging fire doors shall close from the full-open position and latch automatically. The door closer shall exert enough force to close and latch the door from any partially open position.



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Section 703.4 Testing.

Horizontal and vertical sliding and rolling fire doors shall be inspected and tested annually to confirm proper operation and full closure.

A written record shall be maintained and be available to the fire code official.

The owner is required to keep copies of tests performed annually on these assemblies.

The inspection includes a verification of the paperwork that the inspection was performed.



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Fire Escapes as Life Safety Equipment

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2018 NCFC 1031.10 Fire Escape Stairs and Ladders.

Section 1031.10 Fire Escape

Stairways. All fire escape stairways and ladders shall be kept clear and unobstructed at all times and shall be maintained in good working order. All fire escape stairways that need to be replaced or repaired shall comply with the requirements of the International Existing Building Code.

Section 1031.10.1 Examination.

Fire escape stairways, balconies, and ladders shall be examined for structural adequacy and safety in accordance with Section 1031.10 by a registered design professional every 5 years, or as required by the fire code official.



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Structural Degradation & Collapse Risk

The Problem: Fire escapes are exposed to the elements and susceptible to rust, corrosion, and material fatigue over time.

Hazards:

Component Failure: Worn or rusted bolts, brackets, and joints can fail under load during an emergency evacuation.

Weight Capacity: A compromised structure may not support the weight of multiple evacuating occupants, leading to collapse.

OSHA & NC Standards: Structures must be safe for use by employees and emergency responders, which requires robust structural integrity.



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Usability and Functional Failures

The Problem: A fire escape is useless if it cannot be navigated safely and quickly during a high-stress emergency.

Hazards:

Lighting/Marking: Inadequate or non-working emergency lighting in the access path or on the escape itself can cause trips and falls.

Slipping/Tripping: Accumulated debris, overgrown weeds, snow, or broken treads create major trip hazards.

Drop-Down Ladder Issues: The final ladder section to the ground must be functional and easily deployable. If it is rusted or jammed, escape is impossible.

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Section 1031.10.2

Examination Report. Records of inspections, testing, and maintenance shall be maintained in accordance with Section 107.3.

Section 1031.10.3

Marking. The open space under fire escape stairways or ladders shall not be used for any purpose. Approved signs or other approved markings that include the words FIRE ESCAPE – KEEP CLEAR shall be provided to prohibit the obstruction thereof.



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Hazards of Flammable Liquid Storage

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Safety cans complying with UL30

NCFC 5705.3.2 Bonding of Vessels

Where differences of potential could be created, vessels containing Class I liquids or liquids handled at or above their flash points shall be electrically connected by bond wires, ground cables, piping or similar means to a static grounding system to maintain equipment at the same electrical potential to prevent sparking.



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Flammable Liquid Storage Cabinets

Listed in accordance
with UL 1275 or
constructed of wood
or metal as specified

Flammable – Keep
Fire Away

Self-closing doors
with three-point latch

2 inch raised sill –
liquid tight

Quantity limited to
120 gallons



5704.3.4.4 Liquids for Maintenance and Operation of Equipment

In all occupancies, quantities of flammable and combustible liquids in excess of 10 gallons (38 L) used for maintenance purposes and the operation of equipment shall be stored in liquid storage cabinets in accordance with Section 5704.3.2. Quantities not exceeding 10 gallons (38 L) are allowed to be stored outside of a cabinet where in approved containers located in private garages or other approved locations.

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NFPA 704

NFPA 704 signs are required in industrial, commercial, and institutional facilities for hazardous materials stored, used, or dispensed in quantities needing a permit, mandated by local fire codes referencing NFPA 704; they must be placed on stationary containers, aboveground tanks, and at entrances to storage/handling areas, including fences and gates, to provide emergency responders with immediate hazard information (health, flammability, instability, special hazards).



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The placard severity numbers for Health Hazard, Flammability, and Reactivity are normally found on the Material Safety Data Sheet (MSDS) for the chemical.

NFPA 704 Sign



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Compressed gas cylinders need to be chained or otherwise secured to prevent them from falling per NCFC 5303.4.1.

When not in use or connected to a manifold, their protective valve caps should be in place.



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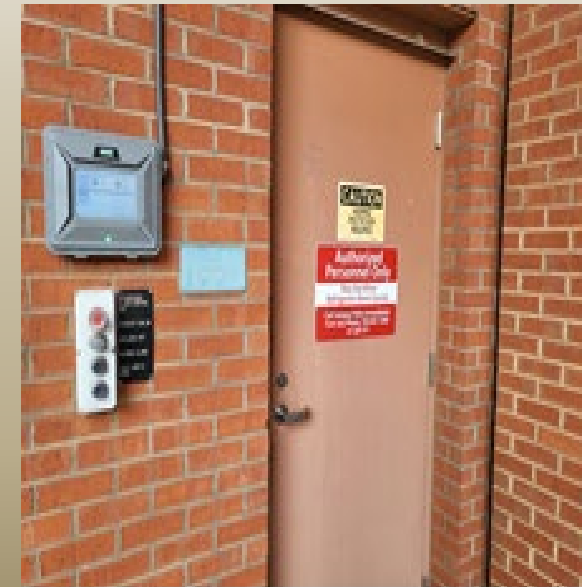


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Internal Large Refrigerate/Chiller 50lbs
or more system

Provide proper signage and
visual/auditable alarms at entrance(s)
and emergency shutoffs for the
mechanical refrigeration room.
These systems shall be
inspected/calibrated annually. NCFC
606, NC Mechanical Code 1106 &
ASHRAE 15.



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Material Safety Data Sheets

Regardless of quantity, MSDS are required for all hazardous materials regulated by the code

Electronic access is permitted

Exception for hazardous waste (manifest will be with waste)



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Navigating NC Fire Codes: Key Violations & Risk Mitigation

Primary Hazards: Decorative Materials

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807.3 Combustible Decorative Materials

In other than Group I-3, curtains, draperies, fabric hangings and other similar combustible decorative materials suspended from walls or ceilings shall comply with Section 807.4 and shall not exceed **10 percent** of the specific wall or ceiling area to which they are attached.

Fixed or movable walls and partitions, paneling, wall pads and crash pads applied structurally or for decoration, acoustical correction, surface insulation or other purposes shall be considered interior finish, shall comply with Section 803 and shall not be considered decorative materials or furnishings.

807.4 Acceptance Criteria and Reports

Where required to exhibit improved fire performance, curtains, draperies, fabric hangings and other similar combustible decorative materials suspended from walls or ceilings shall be tested by an approved agency and meet the flame propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of **NFPA 701** or exhibit a maximum rate of heat release of 100 kW when tested in accordance with **NFPA 289**, using the 20-kW ignition source. Reports of test results shall be prepared in accordance with the test method used and furnished to the fire code official upon request.

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807.3 Combustible Decorative Materials

Exceptions:

In auditoriums in Group A, the permissible amount of curtains, draperies, fabric hangings and other similar combustible decorative material suspended from walls or ceilings shall not exceed 75 percent of the aggregate wall area where the building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, and where the material is installed in accordance with Section 803.13 of the International Building Code.

In Group B and M occupancies, the amount of combustible fabric partitions suspended from the ceiling and not supported by the floor shall comply with Section 807.4 and shall not be limited.

In Group I-3, (jails, prisons, etc.) combustible decorative materials are prohibited.

In Group I-2 Condition 1 and 2, (hospitals, psychiatric hospitals, nursing homes, etc.) occupancies, equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1, combustible decorative materials placed on walls shall be limited to not more than 30 percent of the wall area to which they are attached.

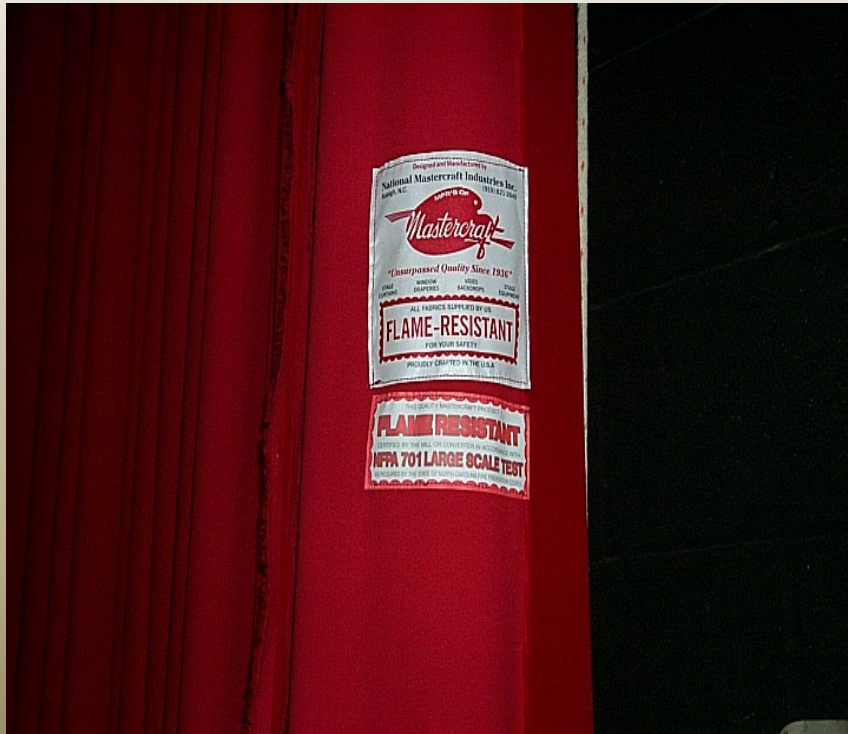
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Stage drapes/curtains shall be of a flame-retardant material. The fire-retardant properties shall be maintained and renewed per manufacturers' instructions. NCFC 803.4 & NFPA 703



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NCFC 807.3

In Group R-2 dormitories, within sleeping units and dwelling units, the permissible amount of curtains, draperies, fabric hangings and other similar decorative materials suspended from walls or ceilings shall not exceed 50 percent of the aggregate wall areas where the building is equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.

The 50% Rule

Measurement: These items (curtains, draperies, and fabric hangings and complies with 807.4) can cover up to 50 percent of the total wall area within a sleeping or dwelling unit.

807.5.6 Dormitories in Group R-2

In Group R-2 dormitories, within sleeping units and dwelling units, the combustible decorative materials shall be of limited quantities such that a hazard of fire development or spread is not present.

Covering not more than 10% of wall or ceiling

2. The 10% Rule: Covering not more than 10% of wall or ceiling and doesn't meet 807.4 Acceptance Criteria

This rule (Section 807.5.6) is a "catch-all" for all other combustible decorative materials that aren't suspended fabrics, such as posters, photos, or small wall ornaments.

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Navigating NC Fire Codes: Key Violations & Risk Mitigation

Three Quick Checks

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Premises Identification:

505.1 Address Numbers:

New and existing buildings shall have approved address numbers, building numbers or approved building identification placed in a position that is plainly legible and visible from the street or road fronting the property.

Post minimum 6-inch address number for this complex.
NCFC 505



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Storage building shall be anchored to prevent uplift and sliding forces. NCBC 1604.

Minimum 30 ft fire separation to non-combustible structures. NCBC.



Provide a water heater relief valve discharge pipe to terminate not more than 6 inches above the floor. NCPC 504.6 (10)

Thermal Expansion tank shall be installed on the cold-water line for the water heater per the manufacturer's directions. NCPC 607.3



Fire Code – Common Violations



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We're Done.



Questions?

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Thank you, Charlie and Jeff for contributing to this presentation.

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Fire Code – Common Violations



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