



National Fire Protection Association
The authority on fire, electrical, and building safety

Protection of Cultural Resource Properties and Historic Buildings – NFPA 909 and NFPA 914

CTIF Fire Prevention Commission Meeting

12 May 2015 | Gregory Harrington, P.E.: Principal Fire Protection Engineer

Historic Buildings and Cultural Resource Properties

- Compliance with current building, fire and safety regulations?
- Achieving compliance can be exceedingly difficult and costly
- Preservation of historic fabric parallels objectives for fire and life safety



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Building Regulations

- Reflection of public expectation for safety
- Primary focus is protection of occupants and neighboring properties
- Preservation of historic fabric and culturally significant collections not typically addressed



Building Regulations

- Typically prescriptive in nature
- Written largely for new construction (exception: NFPA 101, *Life Safety Code*)
- Building rehabilitation not usually addressed (exceptions: NFPA 101 and NFPA 5000, *Building Construction and Safety Code*)



NFPA 909 & 914 - A Different Approach

- Building Regulations
 - Developers
 - Code officials
- NFPA 909 & 914
 - Preservationists
 - Fire protection engineers
 - Facility owners and operators



Technical Committee on Cultural Resources

- Established in the 1940s
 - First pamphlet: *Protecting our Heritage* (1948)
- Current documents
 - NFPA 909, *Code for the Protection of Cultural Resource Properties – Museums, Libraries and Places of Worship*
 - NFPA 914, *Code for Fire Protection of Historic Structures*



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Technical Committee on Cultural Resources

Past & current members include representatives of:

- U.S. Library of Congress
- National Gallery of Art
- Historic Scotland
- Smithsonian Institution
- Schönbrunn Palace, Vienna
- National Fire Corps of Italy
- U.S. General Services Administration
- Colonial Williamsburg Foundation, Virginia
- National Library of Scotland
- U.S. National Park Service
- The J. Paul Getty Trust



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NFPA 909 – Code for the Protection of Cultural Resource Properties



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NFPA 909 – Cultural Resource Property

- Definition
 - Buildings, structures, sites, or portions thereof that are culturally significant or that house culturally significant collections for museums, libraries, and places of worship



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Windsor Castle, UK - 1992



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The Cabildo, New Orleans - 1988



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Morning Star Baptist Church, Portland, OR - 2007



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NFPA 909 – Scope

- Principles and practices of protection for cultural resource properties, their contents, and collections, against conditions or physical situations with potential to cause damage or loss
- Ongoing operations and rehabilitation; acknowledges the need to preserve culturally significant and character-defining building features and sensitive, often irreplaceable, collections and to provide continuity of operations



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NFPA 909 - Purpose

- Minimum requirements for the protection of cultural resource properties and their contents and collections through a comprehensive protection program
- Supplements existing codes and standards
 - Recognizes special nature of cultural resource properties



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NFPA 909 – Application

- Culturally significant:
 - Structures
 - Spaces used for culturally significant purposes
 - Contents
- New buildings and additions
- Existing buildings (NOT retroactive)
 - Alterations, modernizations, renovations
 - Change of occupancy



NFPA 909 – Goals & Objectives

- Collection preservation
 - Protect/preserve original qualities of collection
 - Structural integrity
 - Emergency responder access
- Building preservation
 - Preserve original qualities/character of building, structure, site, environment
 - Minimize removal/alteration of distinctive architectural features



NFPA 909 – Goals & Objectives (continued)

- Continuity of operations
 - Minimize disruption of operations consistent with property's mission and protection goals



NFPA 909 – Protection Plan

- Plan development – Ch. 5
- Emergency operations – Ch. 6
- Fire safety management – Ch. 7
 - Vulnerability assessment
 - Fire safety manager
 - Training
- Security – Ch. 8
 - Vulnerability assessment



NFPA 909 – Construction, Additions, Alterations, Renovations (Ch. 9)

Estimated to cause 15% - 20% of fires in heritage properties



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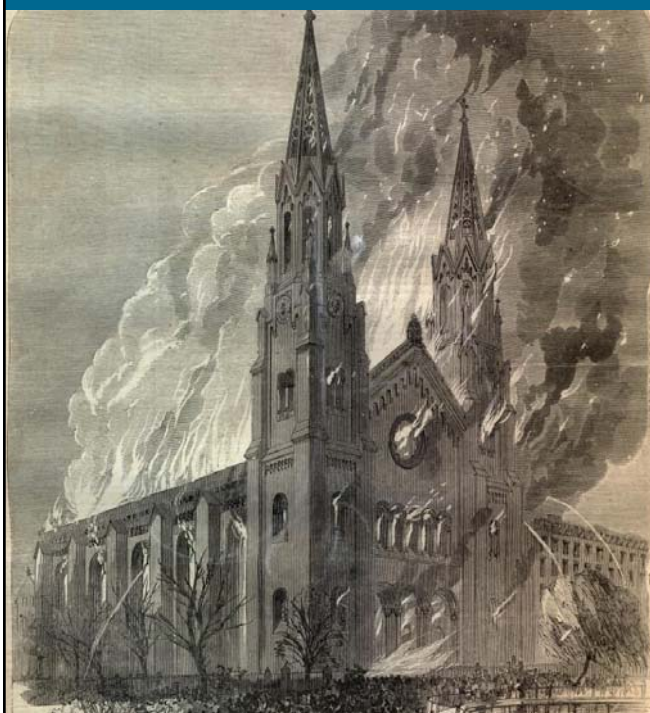
NFPA 909 – Management Operational Systems (Ch. 10)

- Responsibilities of fire safety manager and security manager
- Opening and closing procedures
- Emergency response
- Training and drills
- Compliance audit



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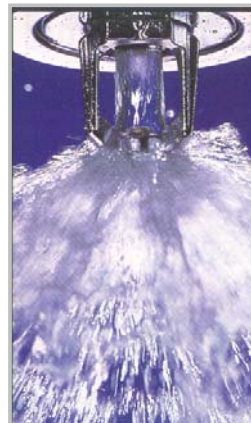


NFPA 909 – Fire Prevention (Ch. 11)

- Decorations
- Housekeeping
- Smoking
- Hot work
- Open Flames
- Chimneys
- Electrical hazards
- Water control

NFPA 909 – Specific Hazards

- Chapter 13 – Special Events
- Chapter 14 – Museums, Libraries, and their Collections
- Chapter 15 – Places of Worship



NFPA 909 – Additional Guidance

- Annex B – Fire Experience in Cultural Resource Properties
- Annexes H & I – Compact Storage Fire Tests
- Annex J – Fire Safety Inspection Forms
- Annex K – Fire System Maintenance Checklists
- Annex L – Salvage of Water-Damaged Library Materials



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NFPA 914, *Code for Fire Protection of Historic Structures*



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NFPA 914 – Historic Structure

- Definition
 - A building, bridge, lighthouse, monument, pier, vessel, or other construction that is designated, or deemed eligible for such designation, by a local, regional, or national jurisdiction as having historical, architectural, or cultural significance



NFPA 914 – Scope and Purpose

- Scope
 - Principles and practices of fire safety and security for historic structures and for those who operate, use or visit them
- Purpose
 - Minimum requirements for protection of historic structures from fire and security vulnerabilities
 - Preserve elements, spaces, features that make them historically significant



NFPA 914 – Goals & Objectives

- Life safety
 - Egress, structural integrity, const./operations, security
- Historic preservation
 - Preserve original qualities or character of building, structure, site, or environment
 - Minimize removal or alteration of historic features
 - Distinctive features treated with sensitivity
 - Encourage compatible use with minimal alteration



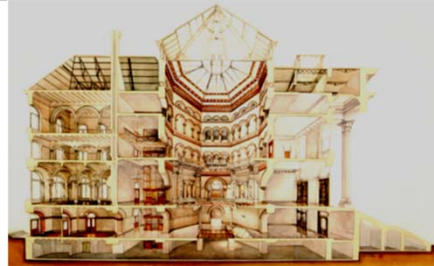
NFPA 914 – Process (Ch. 7)

- Team approach
- Identification of historic features
- Identification of fire safety issues
- Compliance Options
 - Prescriptive provisions
 - Performance-based option
- Compliance Audit



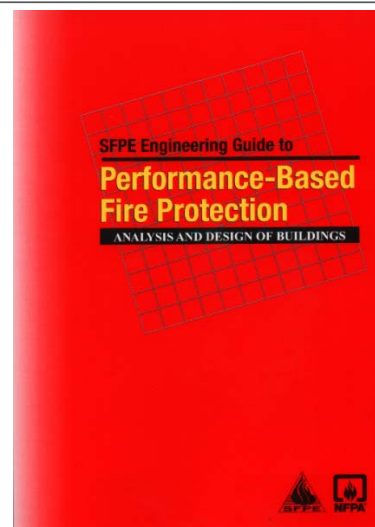
NFPA 914 – Compensatory Features

- Construction materials
- Fire-retardant treatments
- Noncombustible contents
- Fire/smoke barriers
- Shaft enclosures
- Firestopping
- Fire-resistive construction
- Fire detection and alarm systems
- Automatic suppression systems
- Management operational controls
- Electrical equipment



NFPA 914 – Performance-Based Design

- Fire safety goals, objectives and criteria
- Characteristics and assumptions about people or property exposed
- Potential hazards and fire scenarios
- Evaluation tools (calculation methods, computer models, fire tests)



NFPA 914 – Fire Risk Indexing

- Codes specify minimum requirements with no credit for superior conditions
- Fire Risk Indexing balances weak and strong attributes (e.g., height, area, egress path length)



NFPA 914 – Fire Risk Indexing

ATTRIBUTE	GRADE	WEIGHT	SCORE
<i>Fire Prevention</i>		15 %	
<i>Exits / Evacuation</i>		13 %	
<i>Significance</i>		13 %	
<i>Vertical Openings</i>		12 %	
<i>Automatic Suppression</i>		8 %	
<i>Bldg Height & Construction</i>		8 %	
<i>Compartmentation</i>		8 %	
<i>Fuel (contents & finishes)</i>		8 %	
<i>Detection and Alarm</i>		5 %	
<i>Emergency Response</i>		5 %	
<i>Smoke Control</i>		5 %	
	TOTAL	100%	

NFPA 914 – Management Operational Systems (Ch. 10)

- Fire safety manager
- Management plan
 - Operational requirements
 - Fire emergency response plan
 - Training
 - Drills
 - Record keeping
 - Periodic compliance audit
 - Procedures for opening and closing



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NFPA 914 – Fire Prevention (Ch. 11)

- | | |
|-----------------------|-----------------------------------|
| • Decorations | • HVAC systems |
| • Fire spread control | • Commercial cooking/food service |
| • Housekeeping | • Access |
| • Smoking | • Fire proofing |
| • Open flame use | • Lightning protection |
| • Electrical systems | • Wildland fires |
| • Cabling | • Water control |



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NFPA 914 – Provisions for:

- Security
- Additions, alterations & rehabilitation
- Fire precautions during construction, repair, and alterations
- Inspection, testing & maintenance
- Special events



NFPA 914 – Additional Guidance

- Annex B – Planning and Design Appraisal
- Annex C – Survey Criteria for a Historic Structure
- Annex F – Examples of Compliance Alternatives
- Annex J – Fire Safety Inspection Forms
- Annex O – Fire Ratings of Archaic Materials and Assemblies



NFPA's Approach to Building Rehabilitation

- Stepped approach to trigger requirements
- Minor rehabilitation - minimal requirements
- Major rehabilitation - more substantial requirements



NFPA's Approach to Building Rehabilitation

- Existing Buildings
- Rehabilitation
- New Construction



- Repair
- Renovation
- Modification
- Reconstruction
- Change of use
- Change of occupancy
- Addition
- (Historic Building)



Emerging Issues – Dry-Pipe Sprinkler System Corrosion



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Emerging Issues – Impact of Extinguisher Agents on Cultural Resource Materials



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Summary

- Cultural resource properties and historic buildings pose unique fire safety engineering problems
- Other building and fire prevention codes do not adequately address conservation issues
- NFPA 909 and NFPA 914 provide a framework to help bridge the gap



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Questions

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Thank You

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