Avoiding Major Fire Losses at Museums and Cultural Institutions

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Museum Fires

- Harm & damage to:
  - Life
  - Property
  - History
  - Culture
  - Research
Smithsonian Castle Fire of 1865

Burning of the Smithsonian Institution, January 24, 1865. From a contemporary sketch in Harper's Weekly
Recent Museum Fires - Butantan Institute

- Herpetological Collection
  - 77,000 snakes
  - 450,000 spiders & scorpions
- Most important type collections of Brazilian snakes
- 80% of collections destroyed
- No sprinklers or fire alarm
Recent Museum Fires - New Delhi Museum of Natural History
Recent Museum Fires - Museu Nacional, Brazil
Recent Museum Fires - Notre Dame
Recent Museum Fires - Notre Dame
This Will Never Happen To Us...Right?

- 67 museum fires a year between 2007-2011
- Easy to ignore because of everyday hazards
- Reasons museum fires can become catastrophic
  - Absence of fire sprinklers or other suppression
  - A delay in fire discovery
  - Lack of compartmentation of a building
  - Combustibility of collections
What Can Be Done?

• Safety starts with you
• Leadership commitment
• Safety committee
• NFPA 909 (Code for the Protection of Cultural Resource Properties)
• Fire protection program
Fire Protection Program/Goals

Building Codes:

- Provide the **BARE MINIMUM** of life safety for occupants and first responders
- **DO NOT** provide for protection of collections
- **DO NOT** provide for continued operations
Fire Protection Program/Goals

Our Goals:

- Protect Occupants
  - Control fire growth
  - Provide adequate egress
- Protect Collections
  - Effects of fire and smoke
  - Detrimental effects of fire protection
- Protect Property
  - Passive & active systems
Fire Protection Strategies

- Prevention
  - Dedicated operations
  - Combustibles
  - Ignition sources
- Fire Protection Systems
  - Fire suppression
  - Fire detection
- Containment
  - Fire-rated barriers
  - Opening protectives
Fire Prevention

- Control ignition sources
  - Smoking
  - Heat producing equipment
  - Cooking
  - Limited combustibles and electrical equipment
- Manage hot work
- Dedicated collections storage
  - Processing and conservation must take place elsewhere
  - Limited access
Fire Prevention

- Enclosed metal cabinetry
- Hazardous collection separation
  - Cellulose nitrate film
  - Wet collections
- Excess housing materials stored elsewhere
- Noncombustible/Fire retardant construction
Fire Protection Systems
Fire Detection & Alarm Systems

Types of Detection:
- Spot type smoke detectors
- Heat detectors
- Beam type smoke detectors
- Ultra-violet/Infrared flame detection
- Air aspirating smoke detection
Fire Detection & Alarm Systems

Types of Notification:
• Strobes
• Horns
• Speakers
Fire Suppression Systems

- Automatic response
- Low maintenance
- Extremely reliable
- Local to a fire
- Much less water than fire department hoses
Fire Suppression Systems

• Why have sprinklers?
  • ( Extremely rare) small leaks and accidental discharges are always better than a fire
  • Wet items are always easier to salvage than burnt ones
  • Substantial difference in extent of damage
Fire Suppression Systems

Wet Pipe Sprinkler System

- Pipes are filled with water
- No delay in water application
- Lowest maintenance
- Most reliable
Fire Suppression Systems

Dry Pipe System
- Pipes are filled with air
- Cold areas
- Sprinkler activation allows air pressure to drop and valve to open
- Release of air, followed by water
- Delay = air release time
- Higher maintenance
Fire Suppression Systems

Preaction System
• Pipes are filled with air
• Water-sensitive areas
• Water release controlled by smoke detection
• Delay = dependent on system
• Highest maintenance
Fire Suppression - Fire Extinguishers

- Require manual intervention
- All security staff trained in their use
- ONLY put out a fire with an extinguisher if:
  - Alarm turned in
  - People are evacuating
  - Fire is small and contained (think trash can)
  - Escape route behind you
  - You have received training
Fire Suppression - Fire Extinguishers

- Many different types
- You usually see the red dry chemical ones
- Research by Colonial Williamsburg to determine which to use on collections
- Settled on water mist, covers the most types of items, and doesn’t make a mess like dry chemical
Containment - Passive Fire Protection

- Passive fire protection is a system
  - Building structure
  - Walls/Ceilings/Floors
  - Fire rated doors/windows
  - Firestopping
- Steel is not inherently fire resistant - needs insulation
- Fire barriers can also be smoke rated
Containment - Passive Fire Protection

- Fire doors and windows
- Firestopping
- Is a complete system

- Required to:
  - Keep a fire out
  - Keep a fire in
  - Keep a fire from spreading
Collections Storage - All Together Now

- Prevention
  - Effective combination of policies
- Fire Protection Systems
  - Fire Suppression
  - Fire Detection
- Containment
  - Fire ratings
  - Compartmentation
What can you do to prepare?

- Talk to PRICE
- Talk to OSHEM
- Tour with your local Fire Department
- NFPA 909/914
Summary

- Fires can and do happen
- Have a program in place
- Fire protection is always a multi-layered approach