THE VALUE OF A BARRIER MANAGEMENT PROGRAM

Presented by:

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Two Fundamental Ways to Address Firestopping Issues

1. Throw more product at the problem
2. Get to the core of the problem and address it with a combination of:
   - Management approaches
   - Knowledge base (healthcare + firestop + construction)
   - Products engineered for healthcare
   - Superior technology
   - U.L. testing base
   - Support systems
     - Training
     - Tech support
     - Field Support (Dedicated field people)
     - Tools (Paper-Electronic-Web)
     - Materials on site quickly
Are you doing the RIGHT thing
OR
the WRONG thing for the RIGHT cost?

How the owner requested it
How the PM understood it
How the architect designed it
What the contractor bid
How marketing described it

How the contractor installed it
How the project was documented
How the owner was billed
How it was delivered
What the owner really wanted
What is a Barrier Management Program ???

✓ Proactive Approach to Maintaining Rated Wall Integrity
✓ Stop Annual Outlay of Capital for Deficiencies
✓ Document Barriers and Penetrations
✓ Provide Planned Pathways
✓ Create Ownership and Accountability
✓ Surpass Inspection/Accreditation Expectations
Why a Barrier Management Program

✓ Regulatory Compliance
✓ Prevent Escalation
✓ Exhibit Proactive Approach
✓ Prevent Property Loss
✓ Prevent Loss of Lives
Developing an Effective Barrier Management Program

✓ Regulatory Compliance
✓ Goals of an Effective Program
✓ Building a Program
✓ Training and Implementation
✓ Incentives
✓ Cost
✓ Budgeting
✓ Integrated BMP Team
Regulatory Compliance

The Joint Commission

Building Codes

Building Inspection Services

CMS

Centers for Medicare and Medicaid Services

Fire Marshall

Saint Luke's Health System
Program: Hospital

Chapter: Life Safety

Standard: LS.02.01.10 : Building and fire protection features are designed and maintained to minimize the effects of fire, smoke, and heat.

Rationale for LS.02.01.10 :

A building should be designed, constructed, and maintained in order to minimize danger from the effects of fire, including smoke, heat, and toxic gases. The structural characteristics of the building, as well as its age, determine the types of fire protection features that are needed. The features covered in this standard include the structure, automatic sprinkler systems, building separations, and doors. Note: When remodeling or designing a new building, the hospital should also satisfy any requirements of other codes and standards (local, state, or federal) that may be more stringent than the Life Safety Code. Also, the Life Safety Code contains special considerations for minor and major renovation.

Introduction to LS.02.01.10 :

N/A
### Elements of Performance

<table>
<thead>
<tr>
<th>Description</th>
<th>MOS</th>
<th>CR</th>
<th>PFA</th>
<th>DOC</th>
<th>SC</th>
<th>ESP</th>
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</thead>
<tbody>
<tr>
<td>1. Buildings meet requirements for height and construction type in accordance with NFPA 101-2000: 18/19.1.6.2.</td>
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<td>PE</td>
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<td>2. New buildings contain approved automatic sprinkler systems, and existing buildings contain approved automatic sprinkler systems as required by the construction type. (For full text and any exceptions, refer to NFPA 101-2000: 18.3.5.1 and 19.1.6.2)</td>
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<td>ESP-1</td>
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<td>3. Walls that are fire rated for 2 hours (such as common walls between buildings and occupancy separation walls within buildings) extend from the floor slab to the floor or roof slab above and extend from exterior wall to exterior wall. (For full text and any exceptions, refer to NFPA 101-2000: 8.2.2.2)</td>
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<td>PE</td>
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<td>ESP-1</td>
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<td>4. Openings in 2-hour fire-rated walls are fire rated for 1 1/2 hours. (See also LS.02.01.20, EP 3; LS.02.01.30, EP 1) (For full text and any exceptions, refer to NFPA 101-2000: 8.2.3.2.3.1)</td>
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<td>5. Doors required to be fire rated have functioning hardware, including positive latching devices and self-closing or automatic-closing devices. Gaps between meeting edges of door pairs are no more than 1/8 inch wide, and undercut are no larger than 3/4 inch. (See also LS.02.01.30, EP 2; LS.02.01.34, EP 2) (For full text and any exceptions, refer to NFPA 101-2000: 8.2.3.2.3.1, 8.2.3.2.1 and NFPA 80-1999: 2-4.4.3, 2-3.1.7, and 1-11.4)</td>
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<td>PE</td>
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<td>ESP-1</td>
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<td>6</td>
<td>Doors that are fire rated do not have unapproved protective plates that are higher than 16 inches above the bottom of the door. Note: Doors for hazardous rooms may have nonrated protective plates that are placed no higher than 48 inches from the bottom of the door. (For full text and any exceptions, refer to NFPA 80-1999: 2-4.5 and NFPA 101-2000: 19.3.2.1)</td>
<td>PE</td>
<td>C</td>
<td>ESP-1</td>
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<td>7</td>
<td>Doors requiring a fire rating of 3/4 hour or longer are free of coverings, decorations, or other objects applied to the door face, with the exception of informational signs. (For full text and any exceptions, refer to NFPA 80-1999: 1-3.5)</td>
<td>PE</td>
<td>C</td>
<td>ESP-1</td>
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<tr>
<td>8</td>
<td>Ducts that penetrate a 2-hour fire-rated separation are protected by dampers that are fire-rated for 1 1/2 hours. (For full text and any exceptions, refer to NFPA 101-2000: 8.2.3.2.4.1 and NFPA 90A-1999: 3-3.1)</td>
<td>PE</td>
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<td>ESP-1</td>
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<td>9</td>
<td>The space around pipes, conduits, bus ducts, cables, wires, air ducts, or pneumatic tubes that penetrate fire-rated walls and floors are protected with an approved fire-rated material. Note: Polyurethane expanding foam is not an accepted fire-rated material for this purpose. (For full text and any exceptions, refer to NFPA 101-2000: 8.2.3.2.4.2)</td>
<td>PE</td>
<td>C</td>
<td>ESP-1</td>
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<td>10</td>
<td>The hospital meets all other Life Safety Code requirements related to NFPA 101-2000: 18/19.1.</td>
<td>PE</td>
<td>C</td>
<td>ESP-1</td>
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</table>
8.2.3.2.4.2* Pipes, conduits, bus ducts, cables, wires, air ducts, pneumatic tubes and ducts, and similar building service equipment that pass through fire barriers shall be protected as follows:
(1) The space between the penetrating item and the fire barrier shall meet one of the following conditions:
a. It shall be filled with a material that is capable of maintaining the fire resistance of the fire barrier.
b. It shall be protected by an approved device that is designed for the specific purpose.
(2) Where the penetrating item uses a sleeve to penetrate the fire barrier, the sleeve shall be solidly set in the fire barrier, and the space between the item and the sleeve shall meet one of the following conditions:
a. It shall be filled with a material that is capable of maintaining the fire resistance of the fire barrier.
b. It shall be protected by an approved device that is designed for the specific purpose.
(3) *Insulation and coverings for pipes and ducts shall not pass through the fire barrier unless one of the following conditions is met:
a. The material shall be capable of maintaining the fire resistance of the fire barrier.
b. The material shall be protected by an approved device that is designed for the specific purpose.
(4) Where designs take transmission of vibration into consideration, any vibration isolation shall meet one of the following conditions:
a. It shall be made on either side of the fire barrier.
b. It shall be made by an approved device that is designed for the specific purpose.
## Table 1. Understanding the Icons in the CAMHC

Icons have been added to the requirements chapters for clarity and ease of use. The following icons can be found in this manual.

- **D**: The "D" icon appears before a requirement if documentation is necessary.
- **A**: This icon indicates situational decision rules apply.
- **T**: This icon indicates direct impact requirements apply.
- **A**: Indicates scoring category A requirement.
- **C**: Indicates scoring category C requirement.
- **M**: Indicates Measure of Success (MOS) is needed. An MOS is defined as a quantifiable measure, usually related to an audit, which can be used to determine whether an action has been effective and is being sustained.*

*Not every EP requires an MOS. EPs that do require an MOS are clearly marked in the standards and requirements chapters in this manual.

The first page of each requirements chapter contains a key explaining each icon.

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If NOT a "2" or "3", then Indirect Impact

Yes - score "2"

No - score "0"

Rate-based

Scored "2" - one or no occurrences

Scored "1" - two occurrences

Scored "0" - three or more occurrences
Criticality

The more critical the requirement, the more there is a potential risk to patient care or safety and the more immediately the issue of noncompliance needs to be resolved.

Four Categories of Criticality:

1. Immediate Threat to Health or Safety
2. Situational Decision Rules
3. Direct Impact Requirements
4. Indirect Impact Requirements
Firestopping Scoring

1. Category “C” - based upon the number of times that EP is not met

2. EP’s (Element of Performance) evaluated on a 3-point scale

   2 - one or no occurrences of non-compliance (satisfactory compliance)
   1 - two occurrences (partial compliance)
   0 - three or more occurrences (insufficient compliance)
3. “Criticality” of a category “C” is considered as an **Indirect Impact**

4. Indirect impact requirements - ESC (Evidence of Standards Compliance) due within **60 days** of survey

5. RFI (Requirement for Improvement) - must be submitted
Firestopping Scoring Escalation

1. Firestopping findings can be elevated to a Direct Impact

2. Direct impact requirements - ESC (Evidence of Standards Compliance) due within 45 days of survey

3. Can be rolled-up to either
   - Leadership finding
   - Safety of Environment finding
     - Necessary resources are not being allocated for corrections
     - evidence of importance is not exhibited
Why a Barrier Management Program?

Evidence of a Barrier Management Program will:
1. Prevent escalation
2. Exhibit to surveyor proactive approach

Focus on most hazardous areas first:
1. Fire barriers
2. Non-sprinkled areas
Ramifications of Life Safety Deficiencies

It’s the RIGHT Thing to Do!

Accreditation

Findings

New Construction

Inspections

Property Loss

Loss of Lives

Saint Luke’s Health System
## GOALS OF AN EFFECTIVE PROGRAM

<table>
<thead>
<tr>
<th>Accurate Life Safety Drawings</th>
<th>100% Documentation of all rated walls</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% Documentation of all penetrations in rated walls</td>
<td>Correctly Firestopped Penetrations</td>
</tr>
<tr>
<td>Maintain integrity of all rated walls</td>
<td>Training &amp; Education</td>
</tr>
<tr>
<td>Pathways designed for minimal penetrations</td>
<td>Training &amp; Education</td>
</tr>
</tbody>
</table>
Firestopping in a facility WITHOUT a Barrier Management Program
Firestopping in a facility WITH a Barrier Management Program

State Health Dept. → Hospital Facility → Maint. Department
State Health Dept. → Hospital Facility → Const. Department
State Health Dept. → Hospital Facility → IT Department
CMS → Hospital Facility
The Joint Commission → Hospital Facility

Qualified Firestop Contractor

Barrier Mangt. Program

Permitting → Installation → Documentation → Inspections
Building a Program

✓ Accurate Life Safety Drawings
✓ Materials Selection
✓ Software/Program Selection
✓ Contractor Selection
✓ Training & Implementation
✓ Surveys & Inspections
✓ Incentives
Accurate Life Safety Drawings
Material Selection

- Standardize on one manufacturer
- Electronic documentation systems
- Differentiators
- Cable raceways
- Ease of future re-entry
Software/Program Selection

✔ Documents barrier locations on drawings
✔ Data ties back to building plans
✔ Identifies location
✔ Identifies system utilized
✔ Includes photos
✔ Utilizes bar codes
✔ Documents installer
✔ Includes permit program
✔ Inspection tool
✔ Ties into BIM (future)
Software/Program Benefits

✓ Protects contractor
✓ Ease of locating installation issues
✓ Electronic – easy access to data
✓ Reduces manpower/cost
✓ No Excel spreadsheets with opportunity for manual error
Integrated Project Team

- Brings solutions to the table
- Embraces barrier management system
- Interest extends beyond just “putting red caulk in holes”
- Belongs to FCIA
- Reviews systems during design development
- American Society of Healthcare Engineers (ASHE) training
- Healthcare Construction Certificate Program
- Certified Healthcare Constructor
- ICRA & ILSM training

“Stop digging! The plans were upside down!”

“Stop digging! The plans were upside down!”
Value of an Integrated Barrier Management Team

- Team brings SOLUTIONS, NOT PROBLEMS
- Installation ONE time, reducing cost
- Identify cost-saving systems prior to installation
- Assist in training facilities personnel, contractors and subcontractors to reduce installations that increase cost
- All parties have a vested interest
Training & Implementation

Incorrect Installation

Correction

Proper Documentation

Saint Luke Health System
Incentives

✓ Staff to look for permits
✓ Reward billed back to contractor
✓ Contractor as a partner
Components of a Electronic Barrier Management Program

- Develop policies & procedures
- Software
  - Licenses
- Hardware
  - Computers
  - PDA’s
  - Printers
- Barcode Labels
- Life Safety Drawings
- Implementation
- Installation
Cost for
Electronic Barrier Management Program

✓ Initial investment
✓ Annual costs
✓ Licenses
✓ Hardware rental
✓ Life Safety Drawings (incl. in eBMP)
✓ Installation (Negotiated Labor & Materials)
Are you doing the RIGHT thing
OR
the WRONG thing for the RIGHT cost?

Saint Luke’s Hospital – Existing Building SOC

- 785,000 SF
- Identified SOC firestopping corrections - $400,000
- Cost/SF for SOC corrections - $.50/SF
Study of Low Voltage “Super Highway”

4” conduit sleeve
- 50% fill
- requires firestopping each time cables are run in/out
- ongoing cost for life of building

Cable sleeve
- fill until full
- no guesswork
- no cost for cables in/out
- pays for itself within 4 – 5 times of re-firestopping conduit
- 12 - 4” conduits = 7 cable sleeves

Super highway cost for New MAHVI & Women’s Center - $.71/SF
Cost Study of Head of Wall Conditions

Cost if system was determined during design development
- mineral wool w/ elastomeric spray
- requires 2” joint
- maximum ½” movement
- $7.18/LF Installed

Cost for alternate system once construction in place
- speed flex w/ elastomeric spray
- requires 3/4” joint
- maximum ¾” movement
- $13.24/LF Installed

**MEP penetrations through head of wall cost due to EJ’s**
2 x the cost for lack of knowledge and planning

*Saint Luke’s Health System*
Proactive Approach to Head of Wall Conditions

✓ Check structural design criteria for movement prior to start of construction
✓ Movement and joint dimension dictate UL system
✓ Slip track vs. standard track
✓ Include system on drawings and specifications
✓ No excuse for IT holes in walls with super highway installation
✓ IT utilized pathways identified on drawings
✓ NO penetrations through head of wall (MEP Contractors)
Budgeting

✔ Construction Projects
  ✓ $/sf
  ✓ quantify at bid time
✔ Contracting Methodology
  ✓ direct w/ firestop contractor
  ✓ firestop contractor (not trades)
✔ Hold MEP contractors accountable for penetrations
✔ Temporary measures

Maintenance/Existing Buildings
✔ $/sf
✔ Annual budget

(Stop the Bleeding!!!)

BMP vs. Annual Capital Expenditures
What can a Barrier Management Program do for you and your customers???

- ✓ Proactive Approach to Maintaining Rated Wall Integrity
- ✓ Stop Annual Outlay of Capital for Deficiencies
- ✓ Document Barriers and Penetrations
- ✓ Provide Planned Pathways
- ✓ Create Ownership and Accountability
- ✓ Surpass Inspection/Accreditation Expectations
QUESTIONS???

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