

# Florida Hospital Implements Computerized Process for Fire Protection

The Sarasota Medical Center, an 806-bed regional medical facility located in Sarasota County on Florida's Gulf Coast, recently implemented a new computerized program for more effective control of fire protection integrity. This program allows managers and contractors of the 1.6 million square foot facility to automatically track and record access of construction activity and fire protection (firestopping) compliance in the hospital. The Sarasota Medical Center employs 3,000 staff members and 750 physicians, and operates with the assistance of more than 1,000 volunteers.



Facilities Director James Bugyis (left) and Hospital Maintenance Supervisor James Ketchen inspect the contractor work management terminal.

James Bugyis, Facilities Director for Sarasota Medical Center, explains that healthcare facilities are among the most controlled and protected of any structure class in terms of fire protection. "Fire protection effectiveness in hospitals and other commercial buildings has evolved over the past several decades, due to code improvements as well as availability of more effective UL rated smoke and flame control systems. This is perhaps the most crucial aspect of hospital facility management."

According to Bugyis, the key to effective hospital fire protection is compartmentation. Medical institutions are divided into isolated compartments in order to restrict ingress of smoke or flame that may arise in adjacent spaces or floors. Hospital fire codes require a minimum two-hour fire rating to protect patients, staff and visitors in place while a fire is being extinguished.

"Because of the difficulty or impossibility of moving patients in an emergency, hospitals must follow a *defend and protect in place* policy rather than conventional evacuation," the Facilities Director notes. "For this reason, effective smoke and flame control is an absolute requirement."

## Maintaining Code Compliance

The on-going protection of hospital occupants against the deadly threats of toxic smoke and fire depends on both high construction standards and vigilant management. While a hospital or other building may be fitted with the latest in fire protection systems that were fully inspected and approved at the time of occupancy, inevitable changes to equipment, wiring, plumbing and ductwork will result in new penetrations through rated walls and floors. Such breaches must be sealed properly as they are created.



There are thousands of firestopped penetrations in the large Sarasota Medical Center facility.



Nearly every floor and wall penetration type is covered by one of 28 documented UL firestop systems.

Fire creates an immediate pressure differential between an affected area and surrounding compartments, and even a pencil-sized unsealed opening through a wall or partition will allow an adjacent space to fill with toxic smoke in a matter of minutes. For this reason, building and safety managers need to inspect and certify even the most basic construction work.

## Addressing a Problem

Bugyis recalled that a detailed inspection of the Sarasota Medical Center in 1998 by Florida's Agency for Health Care Accreditation (AHCA) revealed a honeycomb of unsealed penetrations in firewalls and floors that seriously compromised fire protection.

"Up to that time there was no formal control of contractors working in the hospital, and no comprehensive work monitoring," Bugyis said. "Department managers incorrectly assumed that cable installers and other construction people were conforming to fire protection standards as they worked in the hospital."

"This problem really exploded in the late 1990s as new computer networks were added. Hospital departments that required additional cabling and related changes in their areas contracted individually with outside suppliers to do the work, and since many of these contractors were not qualified to deal with fire protection, code standards for UL rated firestop systems were frequently violated."

Consequently, it was necessary to invest nearly \$500,000 to restore fire protection integrity and bring the hospital into code compliance, Bugyis reports. The Sarasota Medical Center partnered with 3M Fire Protection specialists to locate and mitigate firestop problems.

Sarasota County's Fire Department and the medical community's Joint Commission also have jurisdiction over hospital fire protection standards, and these authorities conduct periodic hospital inspections as well. Inspections are done in accordance with the National Fire Protection Association 101<sup>®</sup> Life Safety Code<sup>®</sup>, which addresses construction, protection, and occupancy features necessary to minimize danger to life from fire, including smoke, fumes, or panic.

## Fixing The Problem

The discovery of fire protection deficiencies in the hospital ultimately led to a systems approach to fire protection, with the support of 3M's Fire Protection organization.

3M Healthcare Markets Fire Protection Specialist, April Witteman, led the effort and continues to work with the hospital staff as an outside consultant, periodic trainer and team member.

The process began with an educational seminar for the facilities staff, along with a group of primary outside contractors, and instruction included the basics of fire protection, the prevailing codes, firestop product selection and installation procedures.

The second step in system development was to prepare a detailed record of rated barrier penetrations across the entire facility, down to the level of individual patient rooms. "As we examined the structure we discovered a mishmash of fire stopping work," Witteman recalled. "While the rated walls and floors meet code standards, penetration fire stopping was found to be poor at best. In some cases fire barrier penetrations had been left unsealed, while others were improperly firestopped. Portions of the building are 50 or 60 years old, and firestopping work varied widely by area and era."

According to Witteman, Hospital Facilities Director James Bugyis had already assembled a detailed physical record of the hospital, and this information was valuable for the center-wide

firestop assessment and database building process and subsequent software development.

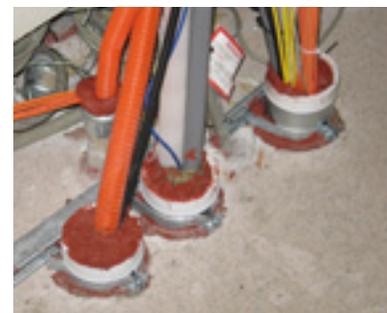
With the database completed, a prioritized list of faulty firestop locations was prepared. The appropriate UL-rated system was identified for each penetration type, and a selected contractor worked systematically to properly seal and mark every fire barrier penetration.

The primary concentration of fire protection penetration seals is in hallway ceilings and above passageway doors, Witteman notes, since most utilities and building services are routed above corridors for construction and access efficiency. This minimizes disruption to patient service areas in the event of repair or construction.

“The bulk of fire barrier penetrations in the Sarasota Medical Center have been firestopped with the proper UL systems using caulks or putty,” said Witteman. “In cases where multiple wires or cables pass through a wall at a single location, contractors generally use a heavy steel 3M™ Pass-Through Device with an internal intumescent component that will swell and completely seal around cables in the event of fire. The hinged pass through device offers easy installation with a removable smoke plug and can be re-opened to accommodate installation or removal of cables in the future rather than having to create additional penetrations.

### On-going Firestop Management and Compliance

With firestop mitigation essentially completed, the team turned their attention to developing a system for preserving fire protection integrity in the future. With the assistance of 3M, Bugyis and his staff developed an online manual of the 25 most commonly used UL systems for fire protection in the hospital. This online resource allows contractors to quickly identify and order firestop products applicable to their work. When a new pipe is placed through a rated floor, a cable is routed through a wall from one compartment to another, or a fire barrier is penetrated for any purpose, the contractor consults this online manual to identify



Floor openings for communication cables are firestopped with intumescent caulk.



A number of 3M™ Fire Barrier Pass-Through Devices in the hospital carry wires through walls while excluding smoke and flame. Identifying tags are required at each location.

### Life Safety Code 101 Code Compliance Program for Hospitals

According to 3M Healthcare Markets Fire Protection Specialist, April Witteman, the proprietary system developed by 3M in conjunction with Sarasota Medical Center is available for use by any medical institution, university or manufacturing facility as a tool for achieving fire protection compliance, and for monitoring and documenting on-going contractor compliance with governing fire protection regulations.

The program is centered on a guidebook that leads facilities management through a six-step process of training, structural condition assessment, selection of appropriate UL firestop systems, work planning, implementation and on-going safety maintenance.



These sample firestopped penetrations are used for periodic contractor training.

Witteman explains that firestop management software included as part of the program supports real-time and facility-wide control to issue work site permits, track contractor work by location and project, issue daily passes, and track the status of every firestop addition, change or removal. It records information for an entire facility and existing or planned firestop systems by building, floor and individual room.

With this software, users can generate reports at will on firestop system inventory and contractor status for effective facility management. Such data serves as a useful reference for inspecting authorities as well.

**For more information on the 3M™ Fire Barrier Management System, visit [www.3M.com/firestop](http://www.3M.com/firestop) or contact:**

**Michael Pattison**

Healthcare Markets Fire Protection Specialist  
(651) 736-4548 • [mdpattison@mmm.com](mailto:mdpattison@mmm.com)



**April Witteman**

Healthcare Markets Fire Protection Specialist  
(239) 287-7535 • [alwitteman@mmm.com](mailto:alwitteman@mmm.com)



Contractors can request an engineering judgment for an acceptable firestop solution in non-standard situations such as shown here.

A qualified engineering judgment must be posted at each firestop location not covered by a standard UL application.



Contractors are required to log in and record all construction and fire protection work by date, location and system used.

the approved UL rated system and clarify installation instructions.

When a non-standard fire barrier penetration situation is encountered, a contractor can request an authorized engineering judgment from 3M to determine an adapted solution that will provide the required protection and satisfy the code. Such judgments are typically provided on a same day basis.

## Smoother Operations

Hospital Maintenance Supervisor James Ketchen explains that the institution has implemented a software program developed by 3M to help maintain on-going compartmental fire protection. This program lists all hospital-certified contractors, and every work crew coming into the hospital is required to log on to the system, enter a permit number, specify the area in which they will be working, the nature of work to be done, and the exact UL rated fire protection components to be used. Installers are required to mark every fire protection penetration point with a tag or label that shows who did the work, the date, and the UL system number.

“When a project is finished the crew leader must record work details on the computer system before logging out,” Ketchen said. “This gives us an accurate and timely record of all on-site work, and ties each job to a specific vendor and team for full accountability. Our trained hospital maintenance staff checks this work periodically, ensuring that we are always fully protected and ready for periodic ACHA, Fire Department and Joint Commission inspections.”

“A real-time record of work underway is also useful in the event of an emergency since it gives the hospital staff an indication of who is on the job at the moment, where they are working and what tasks are in process.”

3M has also provided hospital managers with a proprietary PDA-based audit report that records all of the penetrations to allow the inspection team to find specific locations, verify details, record necessary mitigation work as they move through the center. This tool satisfies the mandate for hospitals to have an up-to-date statement of conditions at all times.

If a violation should be detected during an inspection, the offending contractor will be contacted to make necessary repairs, after which a follow-up inspection is scheduled. Should a second violation occur the contractor is subject to a fine, and any further problem will result in loss of certification. This high standard helps ensure consistent, accurate and timely work on the part of suppliers.

James Bugyis concludes, “Our intent is to keep the entire medical center in on-going compliance with all safety standards, and the hospital safety team conducts monthly inspections to monitor the status of fire protection. This keeps us in readiness for both random and scheduled inspections by the ACHA, the Fire Department and the Joint Commission. These authorities serve as valuable partners in our effort, monitoring and validating the on-going quality of our work, and helping us strive for optimum safety.”



### Building and Commercial Services Division

3M Center  
Building 223-2N-21  
St. Paul, MN 55144-1000  
1-800-328-1687  
[www.3M.com/firestop](http://www.3M.com/firestop)

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