During the 2015 Annual Conference of the American Society for Healthcare Engineering (ASHE), held in Boston in July, George Mills, MBA, FASHE, CEM, CHFM, CHSP, director of engineering for The Joint Commission, spoke to the capacity audience on the relevant issues concerning the physical environment in hospitals today. Mills led off with comments concerning performance improvement and the EC.04 standards.

“I really believe that the EC.04 standards that we have concerning performance improvement is an important feature of what we want you to be doing,” said Mills. “And I get a sense that after 20 years hospitals are still frustrated with how to really do this. Sometimes we overthink things, so I really challenge you to simply look at the performance improvement modules and see how you’re gathering the data and moving forward to make corrective actions and improve your environment. Performance improvement should really be improved performance.”

He explained that if you have committees whose members seem to be tired and distracted, maybe it’s time to shake up your committees and get some new blood into them.

“It’s something that I’m concerned about,” said Mills. “I think the link between the physical environment world and the clinical world intersects with the performance improvement. And as we monitor the physical environment, we can begin solving some of those 700,000 people who are infected each year in that physical environment. I think it is our chance to really get a hold of that 75,000 to 80,000 people who die every year from hospital-acquired illness, and that’s really the thing that performance improvement can get us as we go forward. So I challenge you to shake up your team and move up the concept of improved performance in your organization.”
Mills suggested revisiting the EC.04 standards and drilling down into them to see where improved practices can be implemented. One of the suggestions that he offered was dashboarding.

“Dashboarding is where you identify issues you want to make sure you’re doing the right things about and then monitor how you’re doing it,” said Mills. “So today’s world dashboarding is just the old day-timers from 30 years ago. But I am so convinced what we’re not doing is dashboarding. And when we talked about ASHE’s initiative to get into the C-suite, then we have to start putting out C-suite apps. The C-suite understands dashboarding. Our counterparts in clinical have been dashboarding for years. So if you’re not embracing the concept of dashboarding, then you’re behind.”

Mills then moved on to discuss The Joint Commission’s process to comply with CMS’ Alternative Equipment Management (AEM) program—specifically utility management systems. This applies to both acute care hospitals and critical access hospitals (CAH), but it wasn’t always that way.

“Initially the AEM program was for acute care hospitals only, so we went back to CMS and said, ‘We really need to expand this to CAHs,’ ” said Mills.

One of the Joint Commission Environment of Care (EC) standards says the hospital will design and install utility systems that meet the operational needs for patient care. Mills addressed the issue of aging facilities and meeting this particular standard.

“Many of you have inherited older buildings, and God bless Senators Hill and Burton when they created the Hill-Burton act back in the 1940s,” he said. “Their vision was to put a hospital in every community, and that’s why when you go to the small towns in rural America you will see a hospital there, thanks to Hill-Burton funds. Now those buildings are 50–60 years old, and one of my biggest concerns is the aging infrastructure of our hospitals. So we look at how we designed and built hospitals over the years, and now we’re still using buildings that are 50 years old and trying to install new equipment and technology with that … good luck with that concept, right?”

Mills stated that hospitals really need to be looking at how an aging facility works to provide adequate and safe patient care delivery in the physical environment. Thus element of performance (EP) 1 of this standard really gets to the installation and design of...
systems to make sure they will support the organization’s needs.

Then Mills moved to EP 2 of this standard, which talks about the inventory of equipment.

“If you’re seeking accreditation for deeming purposes, then you need to follow what CMS has dictated to us,” he said. “One of the things they said is, ‘You need to include all of the operating components on the utility systems on the inventory.’ What does ‘all’ mean? Well, all means all. But we did look at this in detail and decided to define it like this: We’re looking at utility systems being on a hierarchical level. We have a heating system; we have a cooling system; we have a sewerage system; we have a waste disposal process. Those are the major systems, and the components to support those systems are really the things we want to look at on the inventory level. So let’s look at that as well. We see that your components are things that have to support the system. So in a heating system, if my boiler dies, do I have a heating system? No, because a major component (the boiler) just died. But what about a steam trap up on 3 West? If that steam trap fails and steam blows through, does that compromise my heating system? No, it’s an energy issue, but my heating system still functions. So do you see the difference between operating components and system-level devices? That is up to you to decide what to include in the inventory, but for a minimum we want you to include the operating components so if they failed, you would lose the system. Hopefully that will ease the burden on what does inventory mean, and what level of depth you have to go.”

Mills commented that hospitals should not hesitate to use the CMS AEM program just because it is new and requires a lot of documentation.

“If you are compliant with what Joint Commission required five years ago, you’re 80% compliant already with the AEM program,” he said. “Really, what you need to be doing is document what you’ve been doing all these years and show us your process that the reliability of the equipment exists in the built environment.”

EP 3 of the standard talks about identifying high-risk operating components in a hospital’s inventory. Apparently there has been some confusion on the definition of “high risk,” so Mills addressed that concern.

“We used to use the term life support,” said Mills. “Life support was somewhat narrow focused, so we brought in high risk as the defining term. Let’s use for example an emergency generator. Is the generator itself life support? No, it is just an engine that generates electricity. Now, a lot of what that electricity powers in the building is probably life support. But the generator itself is not life support based on the definition of supporting life. But if that generator fails, is there a high risk to the patient? There’s an adverse outcome to the patients if that generator fails. So that high risk just broadened what we’re talking about. So certainly a generator is a high-risk component. When we look at the definition of high-risk devices, it may not be equipment that is life support, but if it fails, we are going to have problems with patient care delivery.”

Mills stated that for EP 4, the Joint Commission combined two EPs into one, addressing frequency and what strategies a hospital uses to conduct its preventative maintenance programs. He noted that EP 4 is where the accreditor introduced the concept of the AEM program.

“Joint Commission believes you certainly have the ability to do the AEM program,” said Mills. “We encourage you to do it. Collectively, ASHE, The Joint Commission, and a group called the Association for the Advancement of Medical Instrumentation (AAMI) met and worked out a process for an alternative equipment maintenance program. We approached CMS and we negotiated, and we educated, and we worked with them, and we got this program for you to use to reduce those ongoing costs that manufacturer recommends. We’ve done this for you; please do not turn a blind eye to this. Document what you’re doing and follow the examples here, and you should be more than satisfied with that.”

The EP 5 of the standard talks about some limits to the AEM program. If the state mandates certain requirements, a hospital cannot deviate from those mandates.

“There is also a caveat about new equipment,” Mills said. “If you have new equipment, how can you deviate from manufacturer’s recommendations? You have no history to go back to. But once you have the history, you can make modifications if it makes sense to do so. When we say new equipment, we’re not talking about replacement equipment. But if you’re installing one of those hyper plasma drives from Star Trek that will heat the building, who has experience with that? Neither do I, so that would be considered new equipment.”
EP 6 of the standard talks about a qualified individual who oversees the AEM program. Mills addressed the question of who’s qualified.

“Well, if your organization says you’re qualified to run the facilities, then you just met the requirements for qualifications,” he said.

EP 7 talks about segregating the equipment inventory based on the high-risk equipment in the AEM program. Mills stated hospitals need to be able to perform this segregation so they’ll know how to manage their equipment going forward.

So how will The Joint Commission be surveying the hospital’s level of compliance with the AEM program? “We’re going to be looking at your inventory first,” said Mills. “The inventory is really the fulcrum of a successful program. We will be looking at the accuracy of your inventory and what items are on it. We will be looking at your work order process and how you’re completing the work orders as per your schedule and are they on time. And of course, we define time in the EC standards.”

Mills stated the surveyors will also be looking at the management program, policies, and procedures. They will look at how the hospital deals with things like miscalibration, how the hospital knows that the testing equipment will be reliable when needed, and whether the hospital is looking into equipment-related incidents.

“We want to make sure if you do have, God forbid, a problem with equipment in patient care delivery, that you’re drilling down to see if it was caused by a decision you made in the AEM program,” Mills said. “Or, was it just something that could have been avoided, or was it just one of those things that happened due to your aging infrastructure. So we do want to know if you have a process in that. We will also key in on high-risk components and make sure they are being managed appropriately because of the level of risk associated with those, and we’re going to talk with you about your various equipment strategies.”

Mills announced during his presentation that The Joint Commission has made changes to its survey process that will affect all hospital surveys.

“We made some changes with the process on how we will survey you with the life safety surveyors,” he said. “We’ve revised your survey agenda for how this will happen, and we’ve given you some tracking tools to help you get ready for survey. These are things the surveyors will ask for at the beginning of the survey. And we’ve put down a schedule for the life safety surveyors where they need to be, so they will stay on track with the priorities as they go through the survey. The goal for this change is to increase the thoroughness of our Life Safety Code® survey. The life safety surveyor’s primary goal is to assess compliance, so we wanted to set up a structure so when they come to your site, they can begin right away and start evaluating compliance pretty much from the get-go. So we Leaned out some things and tried to get them some extra time for that. We tried to do that by getting you better educated on what you need to have available for our surveyors at the beginning of survey. So when they come on-site, you can quickly gather the documents for review and make the process more efficient.”

Mills explained that there are some things the life safety surveyors are mandated to look at when they arrive on-site.

“On the first day of the survey when they arrive, they will ask for an escort right away to start the building tour,” he said. “They will start by reviewing your Statement of Conditions and signing off on any open Plans for Improvements (PFIs). They will also determine if you have any existing waivers or equivalencies on the books, and if you do, they will go through them as well. They will probably not go in with the overall survey team introduction meeting with the rest of the staff. We’re going to take that time and start surveying right away with the life safety surveyors. They’re quickly going to get to the operating rooms, probably by 10:30 in the morning on the first day. They’re going to check for pressure differentials, then they are going to go on and do the building tour for the rest of the time. So their primary focus is walking your building to assess your facility for life safety compliance.”

Mills explained that The Joint Commission has developed a new resource called “Life Safety and Environment of Care - Document List and Review Tool.” It identifies the documentation required by the hospital accreditation programs for life safety and selected EC standards. This tool is provided at no charge for use in the hospital’s continuous compliance and survey readiness efforts.

“I strongly encourage you to use this form,” said Mills. “It is free, and it is our hope that when you use that, it will speed up the survey time.”
Protection in the shadows

Facility managers know that they cannot obstruct the spray pattern from a sprinkler. That is why they ensure that items stored on tops of shelves are vertically no closer than 18 inches to the sprinkler deflector. Frequently, hospitals will paint or tape a red horizontal line on the perimeter walls as a reminder to staff to maintain storage below that level.

But most facility managers also know that if they have a wide fixed obstruction, such as an HVAC duct, a deck, or even an overhead door, that is 4 feet or wider, it must have sprinkler protection installed underneath it as well. This rule only applies to fixed obstructions; wide obstructions that are not fixed, such as conference room tables, are not required to have sprinklers underneath them.

Many facility managers also know that ceiling-mounted obstructions are required to be a certain horizontal distance from pendant or upright sprinklers. That distance is dependent on how far the obstruction extends vertically below the sprinkler. The closer the ceiling-mounted obstruction is to the sprinkler, the less it can extend below the sprinkler. Often, the ceiling-mounted way-finding signs in hospitals contribute to a series of problems with sprinkler obstructions.

But what about the vertical structural columns in a room or corridor that may obstruct the spray pattern from a sprinkler? How does the code or standards address the "shadow" caused by the column to the sprinkler spray pattern?

“The term ‘shadow area’ isn’t actually defined in the body of the NFPA 13, Installation of Sprinkler Systems, but it’s clear that most users have an understanding of what it means,” wrote Matt Klaus, principal fire protection engineer for the NFPA in Quincy, Massachusetts, in the July/August 2015 issue of the NFPA Journal. “Simply put, a shadow area is the theoretically dry space beyond an obstruction, such as a structural column or soffit, that will not be covered by water discharged from a sprinkler.”

Fire protection professionals frequently design sprinkler installations with the understanding that there will be certain shadow areas where water may not directly be applied during a fire. How is this permitted?

“A common question I get when teaching NFPA 13 or scanning the NFPA technical advisory inbox is, ‘What is the allowable shadow area for a sprinkler in NFPA 13?’” wrote Klaus. “It is important to understand that the idea of shadow areas on paper is different than what can happen during a discharge event.”

According to Klaus, sprinkler discharge is a complex phenomenon that becomes even more complicated during a fire event due to airflow and pressure dynamics.

“Due to these factors, areas that would remain dry in theory can in fact see some water,” he wrote. “It may not be enough to suppress a fire that originates in that area, but it would allow for some pre-wetting of these areas if they were not initially involved.”

But most facility managers are not as concerned about the design of the sprinkler system as they are about its maintenance, and the obstruction of the spray pattern from a sprinkler is frequently high on their list of deficiencies to watch for. If they see a shadow area behind a column that is not directly protected by a sprinkler, this may be cause for concern. Was the sprinkler designed and installed in accordance with NFPA 13 standards?

“While NFPA 13 does not define ‘shadow area,’ that doesn’t mean that water must reach every square foot of the defined coverage areas for a sprinkler,” wrote Klaus. “The obstruction rules in NFPA 13, like the so-called ‘three and four times rules,’ written to address shadows created by small, non-continuous obstructions, and the ‘beam rule,’ addressing shadows created by solid, continuous obstructions, will allow for some inherent shadow areas on the floor below. These areas will vary depending on the vertical and horizontal distance between the obstruction and the sprinkler.”

So facility managers may be assured that certain shadows to the sprinkler spray pattern caused by vertical columns are permitted according to NFPA 13-2010, section 8.6.5, which covers various types and styles of sprinkler spray obstructions. Knowledge and understanding of these allowances for shadow areas will serve the facility manager well during a survey.
The fire alarm test report

In our last installment on fire alarm systems, we explore the changes that will be expected with the fire alarm test report. NFPA 72 (2010 edition) has specific requirements concerning the test report used to indicate compliance with testing activities. While NFPA 72 does not require that its test report template is used, it does encourage template use. Specifically, the test report must contain the following information:

Property information
- Name, address, description, and occupancy type of the property.
- Name of property representative, along with the rep’s address, phone number, fax number, and email address.
- The name of the authority having jurisdiction (AHJ) over the property, along with the AHJ’s phone number, fax number, and email address. (Note: Healthcare organizations may have five or six different AHJs who assess compliance with NFPA 72. For the purpose of this report, it is suggested the local fire department be listed as the AHJ.)

Installation, service, and testing contractor information
- Name of testing organization, along with its address, phone number, fax number, and email address
- The service technician’s name and qualifications
- The date that a contract for testing and inspection in accordance with NFPA 72 is in effect, the date it expires, the contract number, and the frequency of tests and inspections
- The name of the monitoring organization for the fire alarm system, along with the organization’s address, phone number, fax number, and email address
- The fire responder entity to which the alarm is retransmitted, along with the entity’s phone number

Type of system or service
- Type of system being tested:
  - Fire alarm system without voice
  - Fire alarm system with in-building emergency voice alarm communication system, or EVAC
  - Mass notification system
  - Combination of the above
- Edition of NFPA 72 being used for the test
- Manufacturer of the fire alarm control panel and its model number
- Location where the owner’s manual, a copy of the manufacturer’s instructions, a written sequence of operation, and a copy of the drawings are stored on-site
- Software revision number, when the software was last updated, and the location on-site where a copy of the site-specific software is stored

System power
- Input voltage to the control panel, along with the amps drawn
- Location of the engine-driven generator used for secondary power, along with the location of the fuel storage and type of fuel
- Location of the UPS used for secondary power (if applicable), plus the calculated capacity of UPS batteries to drive the system in standby mode and alarm mode
- Location of all batteries used for the fire alarm system (including NAC panels), plus their type, nominal voltage, amp/hour rating, and calculated capacity to drive the system in standby mode and alarm mode

Remote annunciators
Record the location of all remote annunciators and provide a description of each one.

Notifications made prior to testing
Record the name of the contact person and the time the contact was made to:
- Monitoring organization
- Building management
- Building occupants
- AHJ
- Others, as required

Testing results
The control unit(s) and related equipment must be visually inspected and functionally tested. Devices included in this test are:
• Control unit
• Lamps/LEDs/LCDs
• Fuses
• Trouble signals
• Disconnect switches
• Ground fault monitoring
• Supervision
• Remote annunciators
• Power extender panels
• Isolation modules

A visual inspection and functional test must be performed on control unit power supplies:
• 120-volt power supply
• Generator or UPS
• Battery condition
• Load voltage
• Discharge test
• Charger test

Monitored systems are required to be visually inspected and functionally tested, which includes:
• Engine-driven generators
• Fire pump
• Special suppression systems

Interfaced systems (i.e., auxiliary functions) must be visually inspected and functionally tested, which includes:
• Door-releasing devices
• Fan shutdown
• Smoke management systems
• Smoke damper operation
• Door unlocking
• Elevator recall
• Elevator shunt trip
• Special suppression systems
• Overhead rolling fire doors

Alarm-initiating devices (e.g., smoke detectors, heat detectors, pull stations, workflow switches, etc.) must have a separate itemized list of all devices tested and the results of the test.

Supervisory alarm-initiating devices (e.g., tamper switches, pressure switches, pump-running switches, etc.) must have a separate itemized list of all devices tested and the results of the test.

Alarm notification devices (e.g., strobes, horns, chimes, bells, etc.) must have a separate itemized list of all devices tested and the results of the test.

Notifications that testing is complete
Record the name of the contact person and the time the contact was made to:
• Monitoring organization
• Building management
• Building occupants
• AHJ
• Others, as required

System restored to normal operation
Record the date and time the system was restored to normal operation.

Certification
The service technician certifies that the system has been inspected and tested according to all NFPA standards cited, and includes:
• Signature
• Printed name
• Date
• Organization
• Title
• Phone number

The owner’s representative accepts the test report and must also include the above six items.

The separate device test result sheets that are to be attached to the report for alarm-initiating devices, supervisory alarm-initiating devices, and occupant notification appliances are to include, at a minimum:
• Device type
• Address
• Location
• Test results

It is important to remember that most AHJs want an indication of whether a device passed or failed its functional test.

Once the 2012 Life Safety Code® is finally adopted, the 2010 edition of NFPA 72 becomes effective. All fire alarm test reports will be required to meet these requirements.
When CMS arrives: Are you prepared?

Your hospital just completed its triennial accreditation survey, and you have finalized the Plan of Correction phase with success. The pressure of the survey is beginning to lift, people are starting to take their vacations, and life is getting back to the normal stress level of operating a hospital—and then BAM! The state agency representing CMS is in the main lobby to conduct a validation survey.

You start to panic; have you properly prepared the CMS categorical waiver documentation to present in the opening conference with the surveyors? Can you remember which CMS categorical waivers were adopted, and have you met all of the 2012 Life Safety Code (LSC) requirements to successfully adopt the waivers?

You walk into the opening conference carrying what you hope are the most up-to-date and accurate life safety drawings that you used during the accreditation survey. There sit two state agency fire inspectors, assigned the task of ensuring the hospital’s full compliance with the CMS Conditions of Participation (CoP), especially CoP §482.41, which references standards that require the hospital to comply with the LSC.

“As we all know, CMS expects hospitals to be fully compliant with the Life Safety Code at all times,” says Jerry Stewart, CHFM, CHSP, vice president of the Western Region for TSIG Consulting in New York City.

Maintaining a hospital to be fully compliant with the LSC is nearly impossible. The physical environment is constantly evolving; you fix one deficiency, and another pops up somewhere else. With so much activity going on just from a facility’s normal operation, it is no wonder that doors become damaged and corridors become cluttered.

Stewart has additional advice concerning the life safety drawings prepared by the hospital.

“If you self-identify your life safety deficiencies on your life safety drawings, make sure you do not provide those drawings to the CMS surveyors,” he says. “The state agency surveyors can use that information against you, and you have no protection from the accreditor’s Plan for Improvement list.”

The process that the state agency surveyors take will allow them to thoroughly assess your facility from top to bottom, based on the life safety drawings that you provided.

“You will quickly learn that the state agency surveyors are tracing every foot of the smoke compartment barriers and the fire-rated barriers; reviewing each designated suite; inspecting every hazardous room; walking every egress route; inspecting all horizontal exits and exit passageways,” says Stewart. “You soon realize how critically important it is to keep the facility’s life safety drawing up to date and accurate. We all know how difficult a task that can be with constant renovation and ongoing construction projects, but any inaccurate information on the life safety drawings can lead to problems and possible citations.”

The state agency surveyors will take as much time as they feel they need in order to do a thorough inspection. This is not your typical accreditation survey, where one life safety surveyor is on-site for two or three days. The state agency will send as many surveyors as it deems necessary, and the surveyors will stay for as long as they want, which results in many more surveyor days than the accreditors will provide. This directly translates into more findings.

The life safety documentation review will also be much more arduous. The state agency surveyors will expect the hospital to be compliant with all of the referenced NFPA standards found in Chapter 2 of the LSC. This means you need to ensure that you are compliant with more than what most accreditation organizations require, such as:

- Documented semiannual visual inspections of all fire alarm devices
- Sound pressure readings (in dB) of newly installed audible fire alarm notification devices
- Complete inventory listing of all items inspected or tested with a pass/fail determination
- Annual fire pump flow test conducted under emergency power (where connected)
- Ensuring all components of the sprinkler system are inspected and tested

So what does all this mean? CMS state agency validation surveys can be a much more thorough assessment than accreditation organization surveys.
Fire door assembly relabeling

Often, facility managers get so busy with the daily tasks of operating a hospital that they do not notice the relatively easy deficiencies that accreditation surveyors find. One of the first activities the life safety surveyor does is to walk the facility with a set of life safety drawings and examine the fire-rated barriers. Besides looking for penetrations in the barriers, the surveyor is also examining the doors and frames to ensure they are properly labeled.

Missing or compromised fire door and frame labels are some of the easiest findings a surveyor can cite under compliance with the Life Safety Code®. If the facility manager takes the time to do so, he or she can find those deficiencies before the next survey.

“Consequently, it behooves facility managers to ensure all parts of their facility fire doors are labeled appropriately with the proper nomenclature, fire protection rating, and other required data,” says Luke Moore, director of life safety service for Fire Door Solutions, LLC, in Overland Park, Kansas.

The governing standard for fire door labeling can be found in NFPA 80. While the standard governs fire door labeling at the point of manufacture, the re-labeling of fire doors if a label has been removed or compromised demands the same assessment and concern.

The NFPA standard requires the labels to be applied in a location that is readily visible and convenient for identification by the authority having jurisdiction (AHJ) after installation of the assembly.

The fire door label content is also specified by standards and must include:
• Name of the fire door manufacturer
• Name or trademark of the third-party inspection body
• Fire protection rating (in minutes)
• Maximum temperature end point (for some fire doors)

An independent third-party inspection body is required to carry out fire door re-rating and labeling in the field. Fire door manufacturers and commercial clients are not authorized as qualified independent third-party inspection bodies.

The process of third-party fire door inspection begins with identifying the original fire door manufacturer and rating. There are numerous indications of the original manufacturer to the trained eye. These might include unique markings, hinges, colors, strike plates, and so on. Other nearby and similar fire doors can also provide evidence of the original manufacturer and rating.

“For fire door protection ratings, the type of door construction, material used, and sometimes the construction of the wall that houses the opening are critical to the decision,” says Moore. “Other door details, such as door hardware and glazing, impact the fire door rating. A qualified third-party inspection body will have access to the fire door manufacturer laboratory listings for reference.”

In most cases, a fire door protection rating can be arrived at through this type of field analysis. In rare situations, a representative sample of door construction material will need to be laboratory tested to determine the appropriate fire door rating.

Fire door modifications, although often done innocently, can void the original fire rating listed for a fire door and render the door or frame unable to be labeled. Common fire door modifications can include oversized signage on the door, post-installation holes in door material, installed door stops or kick plates, etc.

In addition to any fire door modifications, fire doors not in compliance with NFPA 80 standards cannot be labeled, as they do not function as designed or intended. Door clearances, door seals, operating lock sets and latches, and door closers all need to be tested and verified by a third-party inspection body in order for the fire door to be labeled properly and be judged compliant with standards.

Fire door repairs on the heels of a third-party inspection are the key to getting doors in compliance with standards as soon as possible. Fire doors are a critical part of any life safety plan, and outright replacement of doors is expensive. With the right fire door repair team, the use of approved smoke seals, through-bolts, shims, and fire door caulk can be used to meet standards and avoid replacements.
Editor’s note: Each month, Senior Editor Brad Keyes, CHSP, owner of Keyes Life Safety Compliance, answers your questions about life safety compliance. Our editorial advisory board also reviews the Q&A column. Follow Keyes’ blog on life safety at www.keyeslifesafety.com for up to date information.

Major vs. minor renovation

Q How do I determine whether a project is considered major or minor renovation? This makes a difference on whether we follow Chapter 18 or Chapter 19 requirements in the Life Safety Code.


“Major” means the modification of more than 50 percent, or more than 4,500 square feet, of the smoke compartment. “Minor” means the modification of less than 50 percent, or less than 4,500 square feet, of the smoke compartment. The replacement of a system, such as a fire alarm system, would be “major” for that system only. Thus, that system would have to meet the requirements for New buildings, not the entire building itself.

Traditionally, when a renovation or modernization is more than fifty percent of the size of the area being renovated or modified it must comply with the requirements for New. However, cosmetic changes such as painting and wallpapering by themselves, would not constitute a “major” rehabilitation regardless of the size of the area affected. These general principles should be applied by surveyors to the particular circumstances of each case. The following examples may be helpful in providing further guidance: When an entire floor is gutted, the renovation of that floor should be considered “major” and meet the requirements for New. If corridor walls or partition walls between rooms are removed in their entirety (to make additional space or to reconfigure rooms), the replacement wall should meet New requirements. In such a case, it may not be necessary for the entire building to be upgraded to New requirements, merely the replacement area. Any sprinklers installed in a patient sleeping zone should be of the quick response type (i.e., those which are tested under the same product testing criteria as standard sprinklers, but also exhibit the fast response characteristics of listed residential sprinklers).

However, accreditation organizations also recognize section 4.6.7 of the 2000 edition of the LSC, which says that, in effect, any alteration must meet the conditions for new construction. That means any change that you make, such as installing a new door assembly, must meet the requirements for new construction. So, to answer your question, all renovation must meet new construction requirements. If the question arises as to how much renovation would constitute having to renovate the entire smoke compartment to meet new construction, the accreditation organizations would follow the guidelines of “major” and “minor” as specified in the CMS memo.

Suite definition

Q I can’t seem to find the definition of a suite in the Life Safety Code. What defines a suite?

A Think of a suite as nothing more than a large room with a lot of smaller rooms inside. The 2000 edition of the LSC does not define a suite, but the 2012 edition does. That edition says a suite is: “An accommodation with two or more contiguous rooms
comprising a compartment, with or without doors between such rooms, that provides sleeping, sanitary, work, and storage facilities.” And: “A series of rooms or spaces or a subdivided room separated from the remainder of the building by walls and doors.”

There are different types of suites:
• Non-patient-care suites
• Patient care non-sleeping suites
• Patient care sleeping suites
• Patient care suites

Currently, the 2000 edition of the LSC limits suites to the following sizes:
• 5,000 square feet for patient care sleeping suites
• 10,000 square feet for non-patient sleeping suites

The 2012 edition has relaxed those limitations, and hospitals may adopt that section of the 2012 LSC through CMS categorical waivers. Since a suite is considered a room (no matter how large it is), it is subject to the rules and regulations that concern all rooms, mainly:
• It must be separated from the corridor by appropriate corridor construction, including doors and windows
• Entrance doors to the suite from the corridor must positively latch
• Egress from the corridor into the suite to get to an exit is not permitted

Sliding glass doors with dead-bolt locks

Q In an existing hospital, exiting from the main lobby, there are two glass horizontal sliding doors. These doors are exit doors and are capable of swinging on side hinges if pushed from the inside toward the outside. These doors have a thumb-turn dead-bolt lock on them to secure the lobby after hours. Are these dead-bolt locks permitted in this application?

A Doors in the path of egress cannot have more than one releasing action to operate the door. (See 7.2.1.5.4 of the 2000 edition of the LSC. Pushing or pulling the door is not considered a releasing action.) If the external exit door is not installed in a fire-rated barrier (most Type I and Type II buildings are exempt from having external walls that are fire rated), then there is no requirement that the external exit door has to be a fire-rated door. If the exit door is fire-rated, then it must have a closer and fire-rated hardware that allows the door to be positively latched. A dead-bolt lock on a fire-rated door that has positive-latching hardware would not be permitted, as two actions would then be required to operate the door (turn the dead-bolt thumb-turn device to unlock the door, and grab and turn the door handle to unlatch the door). However, if the doors that you mentioned are non-rated doors, and if they do not have positive-latching hardware, then I could see that a dead-bolt device with a thumb-turn would be permitted. But it would only be permitted as long as there is no other device (i.e., door handle or crash bar) needed to operate the door. The dead-bolt device would have to be mounted on the door no less than 34 inches above the floor and no more than 48 inches above the floor.

New construction supply room

Q Is it not the case that in new hospital construction, clean storage rooms between 51 and 100 square feet need only have a self-closing door meeting 18.3.6.3.4? Only clean storage rooms greater than 100 square feet need to be one-hour rated. Since not mentioned in table 18.3.2.1, I’m assuming storage rooms smaller than 50 square feet need not be rated nor have a self-closing door. If all of that is correct, I have an engineer telling me that I need a smoke detector in a small storage room less than 50 square feet. My hospital is fully sprinklered.

A You are correct. Chapter 18 of the 2000 edition of the LSC for new construction does not require storage rooms that contain combustible materials and are between 50 and 100 square feet to be fire rated; they only need a self-closing and positive-latching door. Storage rooms that contain combustible materials and are less than 50 square feet are exempt from hazardous area requirements, so a self-closing device on the door would not be required. There is no LSC requirement for a smoke detector in this type or size of room. Perhaps the engineer is citing a different code or standard. I suggest you ask him or her to provide a code reference for review.
Quick tip

Fire alarm test report requirements—
NFPA 72

Date: ___________________________ System: ___________________________
Name of Property: ___________________________ Occupancy Type: ____________
Property Representative: ___________________________ Address: ________________
Phone Number: ___________________________ Fax Number: ___________________________ Email Address: ___________________________
Name of AHJ: ___________________________ Phone: ___________________________ Fax: ___________________________ Email: ___________________________
Name of Individual Performing Test: ___________________________ Affiliation: ___________________________
Address: ___________________________ Phone: ___________________________ Fax: ___________________________ Email: ___________________________
Date of Contract: ___________________________ Date Contract Expires: ___________________________ Contract Number: ___________________________
Monitoring Agency: ___________________________ Address: ___________________________
Phone Number: ___________________________ Fax Number: ___________________________ Email Address: ___________________________
Fire Responder Entity: ___________________________ Phone: ___________________________
Type of Fire Alarm System Being Tested: ________ Without Voice ________ EVAC ________ Mass Notification ________ Combination ________
NFPA 72 Edition Used for Test: _______________ Fire Alarm Control Manufacturer: _______________ Model Number: _______________
Location of Owner’s Manual: ___________________________ Location of Manufacturer’s Instructions: ___________________________
Location of Sequence of Operation: ___________________________ Location of Drawings: ___________________________
Software Revision Number: _______________ Software Last Updated: _______________ Location of Copy of Software: ___________________________
Location of Generator for Secondary Power: ___________________________ Capacity in Standby Mode: ___________________________
Location of UPS for Secondary Power: ___________________________ Capacity in Alarm Mode: ___________________________
Location of All Batteries Used for Fire Alarm System (Including NAC Panels):
_______________________________________________________________________________________________________________________
Type of Batteries: ___________________________ Nominal Voltage: ___________________________ Amp/Hour Rating: ___________________________
Capacity in Standby Mode: ___________________________ Capacity in Alarm Mode: ___________________________
Location of Remote Annunciators: ___________________________
Notifications Made Prior to Testing (Name):
Monitoring Organization: ___________________________ Time: ___________________________
Building Management: ___________________________ Time: ___________________________
Building Occupants: ___________________________ Time: ___________________________
Authority Having Jurisdiction: ___________________________ Time: ___________________________
Others, as Required: ___________________________ Time: ___________________________
Notifications Made That Testing is Complete (Name):
Monitoring Organization: ___________________________ Time: ___________________________
Building Management: ___________________________ Time: ___________________________
Building Occupants: ___________________________ Time: ___________________________
Authority Having Jurisdiction: ___________________________ Time: ___________________________
Others, as Required: ___________________________ Time: ___________________________
System Restored to Normal Operation: Date: ___________________________ Time: ___________________________
I certify that this fire alarm system has been inspected and tested according to all NFPA standards cited.
Signature: ___________________________ Print Name: ___________________________ Date: ___________________________

As owner’s representative, I accept this test report:
Signature: ___________________________ Print Name: ___________________________ Date: ___________________________

1. (T) (F) According to George Mills, the link between the clinical world and the physical environment world intersects with performance improvement.

2. (T) (F) According to George Mills, performance improvement is where the clinical world and the physical environment world intersect.

3. (T) (F) The vision of the Hill-Burton act of the 1940s was to put a clinic in every community in America.

4. (T) (F) According to George Mills, a person is qualified to oversee the Alternative Equipment Management program if his or her organization says the person is qualified.

5. (T) (F) Under Joint Commission changes, the life safety surveyor will now join the rest of the survey team for the opening introduction meeting.

6. (T) (F) A CMS validation survey will evaluate the hospital’s compliance with Condition of Participation §482.41 on the physical environment.

7. (T) (F) The state agency performing the validation survey on behalf of CMS will assess every fire-rated barrier and smoke compartment barrier for compliance.

8. (T) (F) Missing or compromised fire door and frame labels are some of the easiest findings surveyors can cite when conducting a survey for compliance with the Life Safety Code®.

9. (T) (F) Hospitals will often paint or tape a red horizontal line on the perimeter walls 12 inches below sprinklers as a reminder to staff to maintain storage below that level.

10. (T) (F) According to Matt Klaus of the NFPA, a shadow area is the theoretically dry space beyond an obstruction, such as a structural column or soffit, that will not be covered by water discharged from a sprinkler.
1. True.

2. True.

3. False. The vision of the Hill-Burton act was to put a hospital in every community in America.

4. True.

5. False. The life safety surveyor will want to get started with the building tour right away.

6. True.

7. True. State agency surveyors also will review every designated suite and hazardous room, walk every egress route, and inspect every horizontal exit.

8. True.

9. False. The space below sprinklers must be kept clear for 18 inches, not 12 inches.

10. True.