During the first quarter meeting of the Hospital Engineers Society of Northern Illinois (HESNI), a regional chapter of the American Society for Hospital Engineering (ASHE), held at the Joint Commission headquarters in Oakbrook Terrace, Ill., George Mills, MBA, FASHE, CEM, CHFM, director of engineering at The Joint Commission, spoke on the top findings cited during hospital surveys in 2013, and how they relate to facilities management.

Not surprisingly, the top EC and Life Safety (LS) findings for 2013 were ranked the same as they were in 2012. Of all the surveys conducted in 2013, seven of the top 10 findings by surveyors were either EC- or LS-related, and 11 of the top 20 findings for all surveys were also EC-or LS-related. (See p. 12 for a complete summary.)

Each of the EC or LS standards that made the top findings in 2013, and their ranking, were reviewed.

**LS.02.01.20 (#2)**

This standard requires that the integrity of the means of egress must be properly maintained. Fifty-one percent of all hospitals surveyed in 2013 had a finding under LS.02.01.20. This standard has been cited in more than half the surveys conducted since 2010, and has been the most-often-cited standard from the EC or LS chapters. Corridor clutter is a problem that persists regardless of how many times a surveyor cites it. It appears that hospitals are willing to take the hit on a finding under this standard since there is apparently little room for storage of items in the corridor.

Anything left unattended in the egress corridor for more than 30 minutes is considered clutter and is not permitted. Items may be stored in a dead-end corridor as long as they do not exceed 50 square feet and do not obstruct access to an exit. The Joint Commission permits crash carts, isolation supply carts, and chemo
carts to be left unattended in the corridor since they are considered in use.

Mills had advice on how facility managers can reduce the corridor clutter in their facility.

“I understand that facility managers are not the ones leaving the items unattended in the corridor, but unfortunately, they are the ones who own LS.02.01.20, EP 13,” said Mills. “When I speak to hospital leaders at Executive Briefings conferences, I spend a lot of time on the issue of corridor clutter because I realize it’s really going to be the healthcare providers on the units that are causing the problems. I tell them we expect the exit corridors to be clear and unobstructed. Staff needs to be educated on the risk of corridor clutter to the patient. It obstructs patient movement during an emergency and it impedes additional staff responding to provide emergency care.”

Mills also discussed the common problem with suites not being identified on life safety drawings.

“The life safety drawings need to clearly identify the boundaries of the suites, the area of the suites (square footage), and the location of exits,” said Mills.

Mills explained that the drawings need to have a legend that includes:

- All features clearly identified
- Areas of the building that are sprinklered if the building is not fully sprinklered
- Location of hazardous areas
- Location of all rated barriers
- Location of all smoke compartment barriers
- Suite boundaries, including the area (in square feet)
- Locations of designated smoke compartments
- Location of any chutes and mechanical shafts
- Any approved equivalencies or waivers

Mills added that contrary to a recent article in a Joint Commission Resources publication, life safety drawings do not need the level of detail where the fire extinguishers or pull stations are located.

EC.02.05.01 (#4)

This standard requires ventilation systems to provide appropriate pressure relationships, air-exchange rates, and filtration efficiencies. Mills explained that the most common problems identified by surveyors include the
improper air pressure relationships to adjacent areas, such as a soiled utility room needs to be negative to the egress corridor. Other problems include the incorrect number of air changes per hour and improper filtration.

“To determine air-pressure relationships in certain rooms, surveyors use a clean tissue held at the bottom of the door and which way it flutters tells the surveyor whether the air-flow is positive or negative,” explained Mills. “If the air-flow is supposed to be negative, the tissue is expected to pull into the room; and conversely, if the air-flow is supposed to be positive, then the tissue is expected to flow away from the room.”

A finding under this standard and element will automatically trigger a Condition Level Deficiency (CLD). This is a CMS requirement that The Joint Commission must comply with and if this is written, the hospital will receive a follow-up survey within 45 days, from the accreditor.

“We want to see if you have corrected this deficiency,” said Mills. “What I am willing to do for you, is when we find if you can correct the zone and show us the air-flow is repaired before my life safety surveyor leaves the building, we are willing to change the finding from a CLD to a standard level. The finding will remain, and you still have to do the after-survey follow-up, but if I can get you to fix an adverse condition right now, I am willing to give you the relief of us not coming back in 45 days to field verify.”

Mills continued to explain that adjustments to the air-flow must include a resolution to the entire air delivery system, not just the room in question.

Mills also addressed the ever-changing air-pressure requirements for endoscopy procedure rooms.

“This just in: ASHRAE [American Society of Heating, Refrigerating and Air-Conditioning Engineers] just voted to move endoscopy procedure rooms from being positive to N/A or no requirement,” announced Mills. “The FGI (Facilities Guidelines Institute) is planning on releasing this in their November publication of the 2014 Guidelines. Therefore, if an organization has made a documented decision based on a risk assessment to no longer monitor endoscopy procedure rooms as per the 2013 ASHRAE decision, we would accept this. If the organization has not made a documented decision, then the procedure room should be evaluated as per the following:

• 2014 edition of Guidelines: No requirements
• 2010 edition of Guidelines: Positive air pressure
• 2006 edition of Guidelines: Neutral air pressure
• 2001 edition of Guidelines: Negative air pressure
• 1996/1997 edition: No requirements
• 1992/1993 edition: No requirements
• 1987 edition: No requirements
• 1979 edition: No requirements”

Mills explained that there were no changes to the bronchoscopy procedure rooms, or the cleaning rooms associated with bronchoscopy or endoscopy, which are required to be negative pressure.

“We are willing to give this change of ‘no requirements to air-pressure differential’ to you now for the endoscopy procedure room even though we have not adopted the 2014 FGI Guidelines,” said Mills. “What you need to do is make a conscious decision on this and enter it into your Environment of Care committee minutes so you can show my surveyors that you are applying this.”

LS.02.01.10 (#5)

This standard requires building and fire protection features to be designed and maintained to minimize the effects of fire, smoke, and heat.

“The issues cited by the surveyors are door issues, such as undercuts, gaps, closers, and latching; and fire barrier penetrations,” said Mills. “Who is responsible for these fire-rated barriers? The facility manager is ultimately responsible even though someone else may be making the penetrations. In my mind this is a problem in management. The solution is a management approach such as a barrier permit program.”

Mills encouraged those in attendance at the meeting to develop a program that requires all contractors to obtain a permit to work above the ceilings and before any holes are made in rated barriers. Mills announced that The Joint Commission has partnered with ASHE, Underwriters Laboratories (UL), and Firestop Contractors International Association (FCIA) to provide a Barrier Management Symposium at no cost to the attendee, which will be sponsored by local ASHE chapters.
EC.02.03.05 (#6)

This standard requires hospitals to maintain the fire safety equipment and fire safety building features. Most of the findings by surveyors seem to involve the lack of documentation, rather than the failure to actually test or inspect.

“I hate writing these findings,” said Mills. “These are findings where we go on survey and ask to see the test or inspection records. The organization says, ‘I don’t have them.’ This happens on 44% of all surveys conducted in 2013. Who would think it is okay to not know the level of reliability of your fire alarm system for four weeks after the test has been completed? No one would think that, but the lack of an effective management process has created this problem.”

Mills offered a strategy to facility managers on how to solve this problem.

“Why not provide in your bid document that at the end of every day the contractor provides a punch list of any device that has failed,” asked Mills. “That way, all deficiencies can be repaired right away. This provides a management approach to the deficiencies.”

Mills continued to explain that an inventory of all devices that are required to be tested must be documented in the report. The lack of a documented inventory will result in a finding at the appropriate EP.

“Why do organizations need an inventory?” asked Mills. “Because without an inventory, you cannot defend that each and every device was tested or inspected. We need to know that all of the devices are accounted for when you do your test or inspection.”

Mills explained that there will be new consequences to multiple findings under this standard.

“If we write findings in three (3) or more EPs in EC.02.03.05, we are also writing a finding under the leadership standard, LD.04.01.05, EP 4, which says leadership must hold staff accountable for their responsibilities,” said Mills. “If this is the way that the fire safety features are managed, shouldn’t there be some repercussions? Then the facility manager can explain to the CEO why it is okay to not know the level of reliability of the fire alarm system. It’s all about managing the process.”

LS.02.01.30 (#7)

This standard requires the hospital to provide and maintain building features to protect individuals from the hazards of fire and smoke. Most of the findings on this standard concern hazardous areas, primarily door issues such as not having a closer or latches being compromised. Mills offered advice on how to prevent findings on this standard.

“Many door latches are observed to be impaired with gauze or tape,” said Mills. “If nursing is going to the trouble of overriding a latch, what is the root problem here? The solution is to install a magnetic door hold-open device that releases on a fire alarm so the nurses can enter and leave the room when their arms are full of supplies. Let’s work with these people rather than against them. Put yourself in the nurse’s shoes... they’re carrying all this stuff in and out of the room all day long. Manage the problem instead of just removing the tape.”

LS.02.01.35, EP 6 (#8)

This standard requires a minimum of 18 inches clearance between the sprinkler storage and the sprinkler deflector. Mills explained that perimeter wall shelving may extend up to the ceiling, provided it is not directly underneath a sprinkler. The top of shelves must not exceed a horizontal plane that is 18 inches below the sprinkler deflector, but a shelf that is shorter than this may provide a platform for people to place boxes or supplies there that would exceed the 18-inch plane.

EC.02.06.01 (#9)

This standard says interior spaces in hospitals must meet the needs of the patient population and are safe and suitable to the care, treatment, and services provided. Mills explained how this standard can apply to many different safety issues.

“If we had a wild card, here it is,” said Mills. “This [standard] is our wild card for any unsafe condition. If I see a rip in your carpet, is that safe? No. If I see exposed plumbing on a behavioral health unit, is that safe? I don’t know. First thing I’m going to ask the clinical staff, ‘What do you do about all this exposed plumbing in here?’ And if they say they pre-screen all their patients and they do not have any suicidal patients on this unit, then exposed plumbing is not a problem. But if they don’t tell me that they have a clinical intervention program, then I am looking at possible suicide.
hanging points.”
Other examples of unsafe conditions include:
- Unsecured or improper storage of compressed gas cylinders
- A key left in an outdoor trash compactor unit
- Ventilation and humidity issues
- Mold growth
- Scum on sinks
- Offensive odors

**EC.02.02.01 (#11)**
This standard requires the hospital to manage risks related to hazardous materials, but most of the surveyor findings relate to personal protective equipment and the process to manage exposures to hazardous material. Even though OSHA references the American National Standards Institute standard on eyewash stations, ANSI Z358.1, it is not a code or standard that is enforced by any national authority over hospitals. Therefore, The Joint Commission has its own requirements for eyewash stations that may be different than the ANSI standard.

“When I survey, the first thing I’m going to ask you is how do you manage your eyewash stations?” said Mills. “If you say, ‘We do a weekly flush and a monthly flush and an annual inspection’, then that’s how I’m surveying you. You decide what’s appropriate. An eyewash station in the power plant may require a daily flush and inspection, but an eyewash station on a nursing unit may be checked monthly. A sliding scale of testing may be appropriate depending on the situation. We will survey you against your policy.”

Mills explained that portable squeeze bottles are not eyewash stations; they are first aid devices. Mills was asked if eyewash stations have to have tepid water, which is defined to be between 60°F to 100°F.

“If a risk assessment says water temperature out of this range is okay, then we will accept that,” said Mills. “But I have to believe that in our world today we can pipe hot and cold water with a mixing valve to meet the tepid requirement.”

**EC.02.05.07 (#14)**
This standard requires hospitals to inspect, test, and maintain emergency power systems, and the most common surveyor findings involve missed generator and ATS tests. Mills expressed his exasperation with this issue.

“I am so frustrated that this is even on the list,” said Mills. “Generator and ATS testing that are not done on time is inexcusable. All you have to do is test them once a month. How come we’re missing this? I have no explanation how this happens.”

Each ATS needs to be listed as being tested, and the monthly load test is initiated from a test switch at an ATS.

“The weakest link in the generator testing is the electrical line for the start sequence between the start switch on the ATS and the generator,” said Mills. “The start sequence for each generator load test needs to be rotated each month to ensure the starting line connections are tested at each ATS.”

**EC.02.05.09 (#15)**
This standard requires hospitals to inspect, test, and maintain medical gas and vacuum systems. The main issues cited by surveyors include obstructions to shut-off valves, improper labeling of the shutoff valves, and the lack of labeling on medical gas pipes.

“When we look above ceiling for penetrations in rated barriers, we also look to make sure the medical gas piping has labels on them every 20 feet,” said Mills. “No labels on the medical gas piping will lead to a finding. We also find the labels on the zone shut off valves do not always match the labels on the rooms.”

**EC.02.03.01 (#18)**
This standard requires hospitals to manage fire risks, but The Joint Commission is primarily using it to cite open junction boxes, conditions where more than 300 cubic feet of compressed medical gas is improperly stored, and the lack of fire safety training as per fire plan. Mills explained that The Joint Commission is focusing on staff training for surgical site fires. Mills defended the use of this standard for uncovered electrical junction boxes saying exposed wire connections are a potential fire hazard.

**Immediate Jeopardy**
Mills discussed the five most common causes for an Immediate Jeopardy (IJ) decision (also known as Immediate Threat to Life) during a survey. He identified
the following compromised systems or features of life safety that will nearly always draw an IJ decision:
- Fire alarm system
- Sprinkler system
- Emergency power supply system
- Medical gas master panel
- Exits
- Other situations that place patients, staff, or visitors at extreme danger

Time redefined
In discussing the definition of time between tests or inspections, Mills described the changes that go into effect this year.

“Daily, weekly, and monthly are calendar references and if something is required to be tested monthly, then it can be done anytime during that month,” said Mills.

“Now quarterly, we used to say it was like daily, weekly, and monthly, a calendar reference. But nursing also had quarterly requirements that they defined more strictly. They defined it once every three months, plus or minus 10 days. So that means if you conducted a test in January and it is required to be done quarterly, then the next test has to be done in April. But now with this nursing interpretation, we had to synchronize our standards and change to meet their requirements. I am not happy about this, but I just got out-maneuvered … I didn’t see it coming.”

Mills continued to discuss the issue concerning the timing of testing and inspection activities.

“I cannot think of any test that we do that is so time-sensitive that the earth will stop revolving on the axis if we did it 10 days later,” said Mills. “Things happen. We know that some things slip. The due date is there for your convenience. I refuse to have our surveyors count days. If something is due on May 15, that means May to me.”

Inaccessible fire dampers
Inaccessible fire dampers also made the list.

“We are seeing a lot of hospitals list fire dampers as being inaccessible,” said Mills. “Inaccessible does not mean you need a taller ladder. Inaccessible means you have infrastructure preventing access to that damper. I’ve instructed our surveyors to spot-check fire dampers that are listed as being inaccessible.”

New risk icon
The letter ‘R’ inside a square box is a new icon found on many of the 2014 standards, and it identifies specific risks that The Joint Commission believes has an impact on patient care. The accreditor bases the decision on which element receives the ‘R’ icon on the proximity to the patient, probability of harm, severity of harm, and number of patients at risk. Mills described how an ‘R’ element is used during the intra-cycle review, which replaces the old Periodic Performance Review.

“There is a higher sense of sensitivity with an element marked with the ‘R’ icon,” said Mills. “We focus more on the ‘R’ icon elements first, then the direct and indirect elements. We will require hospitals to address the ‘R’ icon elements during the intra-cycle monitoring phone call, conducted midway between triennial surveys. We look at the ‘R’ elements with you, so be prepared and drill down on what we think are important so you can be ready to discuss them during the call.”

Surgical site fires
Mills estimated that there are more than 100 million surgeries performed each year between hospitals and ambulatory surgical centers, and he also estimates between 550–650 surgical site fires each year. Mills says 30 of the fires are considered serious with a result of multiple deaths each year related to surgeries. Sixty-two percent of the fires are in the head, face, and airway region, and 74% occur in an oxygen-enriched environment. More than 68% of the fires are started with electrosurgical equipment (cautery devices), and 13% are started with lasers.

“Surgery site fires are a real problem in our facilities, and we are very concerned about this,” said Mills. “I think what you can do to prevent them is increase your fire drill and education program to the surgical staff. My hunch is, because they have always been in their own little world, they have been overlooked. How often do you gown up and observe that they are participating in fire drills? We are now instructing our life safety surveyors to gown up and interview staff in surgery and ask what they would do in the event of a fire. We are getting a lot of, “I don’t know” answers and a bunch of blank stares. We are writing a lot of findings here. So what I would ask you to do is be more proactive with the surgical staff on all issues of the fire safety plan.”
Life safety compliance strategies

Editor’s note: The following article was written by Robert Hunn, CHFM, CHSP, owner of Hospital Safety by Design, a consulting firm located in San Francisco.

Ensuring consistent compliance with the Life Safety Code® is often a complex and challenging endeavor. Facility managers understand that the requirements for proper maintenance, testing, and inspection documentation equates to a compliant life safety program. But many times there are external factors that affect and undermine this effort resulting in a compromised life safety program.

Specific maintenance and construction services are often performed by outside contractors. Even the best contractors don’t always understand the special requirements and precautions that must be taken when working in a hospital environment. As a result they may not follow the strict hospital Life Safety Code® and infection control procedures required to ensure consistent compliance.

Common examples include:

• A data cabling contractor installs new cable and punches many holes in the fire-rate wall. However, the contractor is not careful about fire caulking every single penetration or he or she may apply the wrong fire-stop. The facility manager may be unaware that the contractor has installed new cables and has left the wall in an unsafe condition.

• A fire alarm contractor tests the system and determines he needs to return with a part the next day to complete the work and takes the branch offline. He does not inform anyone.

• An electrical contractor is working on a particular critical branch of the emergency power system. The contractor needs to return the next day with a part and leaves an emergency power circuit offline overnight until he or she returns to complete the repairs. The contractor does not inform anyone and the system is dangerously compromised for 12 hours.

Any one of these situations could compromise one of your life safety systems and you would not necessarily know it. In fact, more often than not the contractor completes the work, and drops off the paper work with the front desk. The paper work is often filed away, labeled as being complete and not reviewed.

During the next accreditation survey, the life safety surveyor reviews the documentation and sees that one or more of the life safety systems had been compromised for many hours. No alternative or interim life safety measures were discussed, much less implemented because no one knew that the unsafe condition occurred.

How do you avoid these risks and maintain the integrity of your building and life safety systems? First, you start with a policy and procedure detailing the check-in, permitting, and check-out process for all contractors working in the facility. Have every contractor sign in with the facilities department prior to initiating work. The scope of work and where the work will be conducted should be reviewed and agreed upon. A permit is then issued and the contractor must display the permit at the location where the work is being performed.

The types of permits issued include ceiling access, utility shutdown, data cabling and drilling work, hot work, fire alarm system work, and any other activity that affects or has the potential to affect safe daily operation of the hospital. A contractor is required to have the permit visible to employees or be able to produce it upon request by anyone in the hospital.

All employees will expect to see the permit when they see contractors working in their area. Staff are asked to immediately call the facilities department if they observe contractors without a permit in their area. This process adds an extra set of eyes to ensure outside workers do not enter the facility to do contract work without going through the facilities management permit process.

It is suggested that you provide a means of training for the contractors working in the facility. A handout guide on certain rules and requirements on working in a hospital is a must. This should include the hospital’s fire plan, corridor clutter, and rated barrier protection.

Preventing fires and escaping a burning building are the key elements of the NFPA 101 Life Safety Code (LSC). There is less than one fire-related death per year on average in the United States today, according to Michael Crowley, PE, SASHE, FSFPE, executive vice president of Rolf Jensen & Associates, Inc., who spoke recently on the subject during a webinar sponsored by Columbia Books.

“There was approximately 25 times that amount, 25 years ago,” said Crowley.

Crowley’s presentation “Preventing Hospital Fires: New Life Safety Code Compliance for 2014,” covered the many changes to the LSC since the 2000 edition and how they will affect hospitals today.

Changes to the LSC that will affect hospitals most include:
- Editorial
- Definitions
- Suite arrangements
- Exiting
- Corridor
- Special hazards

“There have been multiple editions since the 2000 edition,” said Crowley. “The 2003 edition was primarily an editorial rewrite to change the exceptions to become positive aspects of the code language. There were very few technical changes made during this edition.”

The 2006 edition made significant changes with suites, and the 2009 edition made changes affecting door locks and dead-end corridors. The changes in these editions are all included in the 2012 edition, which will hopefully be adopted soon.

“The Centers for Medicare & Medicaid Services currently requires compliance with the 2000 edition of the LSC and the accreditation organizations have to comply with their ruling,” explained Crowley. “CMS is currently evaluating the impact on the overall cost to adopt a newer edition of the code and hopefully will issue a proposed rule soon.”

After CMS issues its proposed rule on adopting the 2012 edition of the LSC, there will be a public comment period for all to make remarks. After CMS reviews the public comments, Crowley believes the final rule will be issued in late 2014 or early 2015.

Starting with new definitions found in the 2012 edition of the LSC, Crowley explained how these changes may affect healthcare organizations.

“Non-patient care suites are a new definition describing a suite that is not intended for sleeping or treatment of patients,” said Crowley. “This could be designated for a sterile processing department, an administration office, or any other support services area.”

Crowley explained the advantage of this designation may allow greater travel distances to exits than the traditional suite would allow. Another new definition is the normally unoccupied building service equipment support area.

“These areas include interstitial spaces, crawl spaces, chases, tunnels, attics, and other similar areas,” said Crowley. “But they only apply to large, normally unoccupied areas, larger than 45,000 square feet for unsprinklered and 90,000 square feet for sprinklered areas.”

The changes to the 2012 edition of the LSC will provide relief to certain features of life safety for these normally unoccupied building service equipment support areas, such as head-room, aisle width, ‘Exit’ signage requirements, and the number of exits.

Defining attached facilities

Another new definition involves non-healthcare occupancies that are attached to hospitals.

“Ambulatory care facilities, medical clinics, and similar facilities that are contiguous to healthcare occupancies will be permitted to be used for diagnostic and treatment services of inpatients who are capable of self-preservation,” said Crowley. “This will allow inpatients who are capable of self-preservation, to receive treatment in an adjacent building that is not the hospital.”

The changes involving suites in healthcare occupancies are far reaching and will provide much needed relief for many facility managers.

“Suites are required to be separated from the remainder of the building the same as corridors,” said Crowley. “This means the partitions need to resist the
transfer of smoke and have doors that limit the transfer of smoke and positively latch.”

One of the big advantages with the new rules on suites is where two exit access doors are required (due to size of the suite), one door must open directly into the corridor, but the second door may open into an exit stairwell, a horizontal exit, directly to the exterior, or even to another adjoining suite.

“Travel distance to an exit access door in all suites is now listed to not exceed 100 feet,” said Crowley. “Previously, non-sleeping suites had limitations of 50 feet if egress is through two or more rooms.”

The maximum size of sleeping suites has been increased from 5,000 square feet to 7,500 square feet, provided the smoke compartment where the suite is located is protected with quick response sprinklers, or standard response sprinklers and smoke detection. Sleeping suites are even allowed to be increased to 10,000 square feet provided there is direct visual supervision and the suite is completely protected with smoke detection and quick response sprinklers.

“In the 2009 edition, we changed the maximum travel distance to an exit to be consistent with the International Building Code requirements,” said Crowley. “When the 2012 edition is adopted, the requirement will be 200 feet to an exit from any point in a room, provided the building is fully sprinklered.”

Changes are in store that will allow horizontal sliding doors to no longer be required to breakaway and swing, in limited applications.

“Manual sliding doors in healthcare occupancies are not required to be side-hinged and swing if it serves a room with an occupant load fewer than 10 persons,” said Crowley. “This will be very effective in ICUs and similar units.”

It wasn’t until the 2009 edition that special locking arrangements were addressed for security needs. The 2000 LSC does allow the locking of doors for clinical needs, but many AHJs have decided the security needs for infants, pediatrics, and civil disorder do not qualify for the use of clinical needs. Therefore, the only approved approach to locking egress doors in a nursery unit was the use of delayed egress locks. The 2009 edition allows special locks on doors for security needs, provided they meet all of the following requirements:

- Staff must be able to unlock the doors at all times
- The locked area must be protected with smoke detection
- The building must be fully sprinklered
- The locks release upon loss of power
- Smoke detection and sprinkler activation will release the locks

“The new edition of the LSC has eliminated the limitation to just one delayed egress lock in the path of egress,” said Crowley.

A slight change in the code has been made concerning dead-end corridors in existing healthcare occupancies.

“Previously, the wording that says dead-end corridors are limited to 30 feet unless it is impractical or unfeasible to correct was in the Annex section of the code,” explained Crowley. “Now the technical committee has moved that language from the Annex into the body of the code.”

Corridor clutter may not be eliminated, but with the new 2012 edition of the LSC, it may be easier to manage and define.

“In corridors that are at least 8-feet wide, wheeled carts and equipment can reduce the corridor width to no less than five feet,” shared Crowley. “However, the fire plan and staff training must address the relocation of the mobile equipment during a fire alarm.”

Mobile equipment is limited to:

- Equipment in use and carts in use
- Medical emergency equipment not in use
- Patient lift and transport equipment

“I define patient transport equipment as wheelchairs and gurneys,” said Crowley. “Not beds. I do not consider beds as patient transport equipment.”

There are more changes in store for corridors: fixed furniture.

“Corridors that are at least 8-feet wide will be permitted to have fixed seating,” said Crowley. “Provided it is attached to the floor or the wall; the remaining corridor is at least 6-feet wide; the area of the furniture does not exceed 50 square feet; and the furniture grouping is separated by 10 feet.”

In addition, the fixed furniture cannot block access to building services or fire protection devices.”
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.

Storage in generator rooms

Q I cannot find a code reference that prohibits storage in the generator enclosure. Is there a specific reference for this in the 2000 edition of the Life Safety Code®?

A Sections 19.5.1 and 9.1.3 of the Life Safety Code (2000 edition) references NFPA 110, Standard for Emergency and Standby Power Systems, 1999 edition, section 5-2.1, which requires the generator to be installed in a separate room for Level 1 installations, which applies to hospitals. NFPA 110 does require a minimum two-hour fire rating, or the generator must be located in an adequate enclosure located outside of the building capable of resisting the entrance of snow and rain at a maximum wind velocity required by local building codes. No other equipment, including architectural appurtenances, except those that serve this space, is permitted in this room.

In addition, section 5-2.2 of NFPA 110 does not allow generators to be installed in the same room where normal electrical equipment service is installed. These two sections are being interpreted by many national authorities whereby absolutely nothing is allowed in the same room as the generator. The good news (if there is any), is the most recent edition of NFPA 110 (2010 edition) does allow small repair parts, tools, and manuals in this generator room, but that edition will not be part of our accreditation process until CMS adopts the 2012 edition of the Life Safety Code. So for now, we must comply with the 1999 edition of NFPA 110.

Oxygen storage in business occupancies

Q Our hospital has an off-site building for our cardiac rehab, physical therapy, and pulmonary rehab programs. It also houses our business office and some physician offices. The building is classified as a Business Occupancy. What are the requirements for storing oxygen cylinders in a non-rated storage room?

A A business occupancy that provides services for cardiac rehab, physical therapy, and pulmonary rehab programs is considered to be a healthcare facility. Assuming you are either Joint Commission–accredited, or receive federal reimbursement monies for Medicare or Medicaid services, you are required to comply with NFPA 99 (1999 edition) Health Care Facilities standard.

According to section 1-2, NFPA 99 (1999 edition) applies to all healthcare facilities, and section 2-1 defines a healthcare facility where medical care is provided. Chapter 13 in NFPA 99 is the chapter for “other” healthcare facilities which are not hospitals, nursing homes, and limited care facilities. Section 13-3.8 requires all gas equipment to conform to chapter 8. Section 8-3.1.11 lists the storage requirements for nonflammable gases greater than 3,000 cubic feet and quantities less than 3,000 cubic feet, which are similar (but not the same) as those requirements for hospitals. For storage of quantities of nonflammable gas greater than 3,000 cubic feet, the requirements are the same as those for hospitals, which are found in section 4-3.1.1.2 of NFPA 99. However, for quantities less than 3,000 cubic feet, there is a difference in storing nonflammable gas in quantities of 300 cubic feet or less.

Hospitals have the advantage of having a special
dispensation granted by CMS, in the form of S&C Letter 07-10, published January 12, 2007. In this letter, CMS allows hospitals (but not medical offices or clinics) the advantage of following the 2005 edition of NFPA 99, which permits quantities up to 300 cubic feet of nonflammable gas to not be stored in any special rooms or areas. This exception for ‘up to 300 cubic feet’ is not found in the 1999 edition of NFPA 99.

Therefore, your business occupancy must store all nonflammable gas cylinders in quantities from 0 to 3,000 cubic feet in accordance with section 8-3.1.11.2, which requires a specially designated room that has a door capable of being locked, and all oxidizing gases in this room must be separated from combustibles by 20 feet (or 5 feet if the room is protected with automatic sprinklers), or the oxidizing gases are to be stored in a flammable cabinet with a fire rating of at least 30 minutes.

Main drain tests

Q Where are main drain tests required to be done? This is a large medical facility with nine-story towers. Several fire mains feed the various campus buildings. Is the main drain test required to be done only where the fire mains supply the system risers, or does it also need to be done on each floor at the riser as well? Would you please supply your rationale for your answer?

A According to the 2000 edition of the Life Safety Code, main drain tests are regulated by NFPA 25, Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems, 1998 edition. Section 1-5 of NFPA 25 defines a main drain as the primary drain connection on the system riser and also is utilized as a flow test connection. Section 9-2.6 requires that a main drain test must be conducted annually at each water-based fire protection system riser to determine whether there has been a change in the condition of the water supply piping and control valves.

NFPA 25 does not adequately define what a ‘system riser’ is, so we turn to the Handbook for NFPA 13, Standard for the Installation of Sprinkler Systems, which identifies a ‘system riser’ as the aboveground horizontal or vertical pipe between the water supply and the mains (cross or feed) that contains a control valve (either directly or within its supply pipe) and a waterflow alarm device. A system riser is more than just a subset of the term riser, which is broadly defined as any vertical piping within the sprinkler system.

As indicated by the definition, a system riser can be any aboveground pipe in a vertical or horizontal orientation installed between the water supply and the system mains that contain specific devices. By this definition it appears one could loosely define the locations of a main drain test to be conducted wherever there is a control valve and waterflow alarm switch. In a large multistory facility such as yours, that would most likely require a main drain test at least on every floor, possibly more. The Accreditation Organizations (AOs, such as The Joint Commission, HFAP, and DNV) typically do not seek this level of compliance. Most of the AOs only expect main drain tests to be conducted at the base of the risers of the sprinkler system, not at every floor.

However, depending on your state agency surveyors who conduct CMS validation surveys, it is very reasonable and possible that they will expect the main drain tests to be conducted at every floor. To continue with additional information, the purpose of a main drain test is covered in the Annex section A-9-2.6, which says main drain tests are used to determine whether there is a major reduction in waterflow to the system, such as might be caused by a major obstruction, a dropped gate, a valve that is almost fully closed, or a check valve clapper stuck to the valve seat. A large drop in the full flow pressure of the main drain (as compared to a previous test) normally is indicative of a dangerously reduced water supply caused by a valve in an almost fully closed position or other type of severe obstruction.

After closing the drain, a slow return to normal static pressure is confirmation of the suspicion of a major obstruction in the waterway and should be considered sufficient reason to determine the cause of the variation. ⌂
## Summary of top findings from Joint Commission surveys in 2013

During a recent speaking engagement, George Mills, director of engineering for The Joint Commission announced the top 20 findings made by surveyors during the 2013 hospital surveys. The following chart lists the top findings related to EC or the Life Safety chapters made during 2013. The percentage reflects how many surveys the finding was cited. The chart provides a comparison to previous years’ rankings.

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<tbody>
<tr>
<td>2</td>
<td>LS.02.01.20 EP 13: Corridor clutter</td>
<td>54%</td>
<td>51%</td>
<td>57%</td>
<td>51%</td>
<td>46%</td>
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<tr>
<td>4</td>
<td>EC.02.05.01 EP 6: Ventilation and air-pressure relationships</td>
<td>46%</td>
<td>34%</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>5</td>
<td>LS.02.01.10 EPs 5–7: Door issues EP 9: Rated barrier management</td>
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<td>46%</td>
<td>57%</td>
<td>49%</td>
<td>48%</td>
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<tr>
<td>6</td>
<td>EC.02.03.05 EPs 1–20: Testing and inspection of fire safety equipment EP 25: Documentation</td>
<td>44%</td>
<td>40%</td>
<td>42%</td>
<td>42%</td>
<td>38%</td>
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<tr>
<td>7</td>
<td>LS.02.01.30 EP 2: Hazardous areas EPs 16–23: Smoke barriers and doors</td>
<td>43%</td>
<td>39%</td>
<td>47%</td>
<td>40%</td>
<td>37%</td>
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<td>8</td>
<td>LS.02.01.35 EP 6: Storage too close to sprinklers</td>
<td>38%</td>
<td>34%</td>
<td>33%</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>9</td>
<td>EC.02.06.01 EP 1: Interior spaces are safe EP 13: Temperature and humidity EP 20: Offensive odors</td>
<td>36%</td>
<td>35%</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>11</td>
<td>EC.02.02.01 EPs 3–5: PPE and the process to manage hazardous materials EPs 6 &amp; 7: Hazardous energy sources</td>
<td>33%</td>
<td>30%</td>
<td>N/A</td>
<td>N/A</td>
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<td>14</td>
<td>EC.02.05.07 EPs 4–7: Generator and ATS testing</td>
<td>23%</td>
<td>22%</td>
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<tr>
<td>15</td>
<td>EC.02.05.09 EP 3: Medical gas systems</td>
<td>22%</td>
<td>23%</td>
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<tr>
<td>18</td>
<td>EC.02.03.01 EP 1: Open junction boxes EPs 9, 7, 10: Lack of fire safety training (surgical site fires)</td>
<td>19%</td>
<td>19%</td>
<td>N/A</td>
<td>N/A</td>
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Source: George Mills, MBA, FASHE, CEM, CHFM, director of engineering for The Joint Commission HESNI quarterly meeting, February 27, 2014.

The changes in the rankings and the addition of standards to the list reflect an adjustment in the importance of the standards made by the surveyors during the triennial surveys. Changes on the list made during the past couple of years are a result of a sharper focus on surgical site fires; medical gas labeling; generator testing; ventilation, temperature, humidity and air-pressure relationships; and storage too close to sprinklers.
1. (T) (F) According to George Mills, the top seven findings by surveyors in 2013 were either EC- or Life Safety (LS)-related.

2. (T) (F) The top life safety–related finding cited by surveyors in 2013 involves the integrity of the means of egress.

3. (T) (F) According to George Mills, the life safety drawings need to “clearly identify the boundaries of the suites.”

4. (T) (F) A Condition Level Deficiency is one where the hospital will receive a follow-up survey within 60 days.

5. (T) (F) If an organization has made a documented decision based on a risk assessment to no longer monitor endoscopy procedure rooms, as per the 2013 ASHRAE decision, The Joint Commission will accept this.

6. (T) (F) The Joint Commission announced that if it writes findings in three or more EPs under EC.02.03.05, then it will also write a finding under LD.04.01.05, EP 4, which says leadership must hold its staff accountable.

7. (T) (F) The letter ‘R’ in a black box next to Joint Commission standards and elements is fairly new and stands for ‘Regular,’ or a normal element.

8. (T) (F) The start sequence for each generator load test needs to be rotated each month to ensure the starting line connections are tested at each ATS.

9. (T) (F) The Joint Commission considers FGI Guidelines to be standards that are enforceable at all healthcare occupancies.

10. (T) (F) Emergency power generator rooms are permitted to have noncombustible storage.
1. False. George Mills said seven of the top 10 findings were either EC- or LS-related.

2. True.

3. True.

4. False. A Condition Level Deficiency is one where the hospital will receive a follow-up survey within 45 days.

5. True.

6. True.

7. False. The letter ‘R’ in a black box stands for risk, and The Joint Commission focuses more on ‘R’ icon elements first, then the direct and indirect elements.

8. True.

9. False. According to George Mills: “The FGI Guidelines are only guidelines.” Mills says conditions may exceed those stipulated in the FGI Guidelines, provided a risk assessment is conducted.

10. False. Nothing is permitted to be stored in a generator room.