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Hospital chooses halogen-free cables



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Critical cabinet characteristics



Setting the standard for safety and savings

Mercy Hospital in Joplin, MO opted for halogen-free cables to support converged applications including patient monitoring, diagnostics, AV, security and building automation.

BY CLAY SHAW, RCDD, GENERAL CABLE

Founded by the Sisters of Mercy in 1986, the Mercy health system is the fifth largest Catholic healthcare system in the United States and includes 33 acute care hospitals, 4 heart hospitals, 2 children's hospitals and

another nearly 700 healthcare facilities throughout Arkansas, Kansas, Missouri and Oklahoma. Named a 2014 "Most Wired" healthcare organization by the American Hospital Association, Mercy is also among the

first healthcare organizations in the U.S. to deploy a comprehensive, integrated electronic health record system and provide patients with online access to their medical information and doctors.

While a focus on technology, innovation and patient satisfaction is paramount at Mercy healthcare facilities, so is safety. The new Mercy Hospital in Joplin, MO, which replaces the former St. John's Regional Medical Center destroyed by a tornado on May 22, 2011, is designed to protect the hospital against natural disaster and ensure occupant safety. Even the network cabling infrastructure



Opening in March 2015, Mercy Hospital Joplin replaces the former St. John's Regional Medical Center, which was destroyed by the deadly tornado that hit Joplin, MO on May 22, 2011.

that will deliver advanced technology throughout the new facility was designed to ensure occupant safety in the event of a fire.

While it may seem like a minor decision in the grand scheme of building a new 260-plus private-room hospital that will occupy nine floors and nearly 900,000 square feet, there are several considerations when choosing network cable that supports daily operations within a healthcare facility. With millions of feet of cabling running throughout a hospital to deliver information for everything from patient monitoring, nurse call and digital diagnostics, to audiovisual, security and building automation, designers need to consider cost-effectiveness, performance and occupant safety. By standardizing on General Cable's 17 FREE line of cables, the new Mercy Hospital Joplin and subsequent Mercy facilities are able to deliver all three.

A unique third option

Nowhere do occupants benefit more from a clean, comfortable environment than in a hospital. Heating, ventilation and air-conditioning (HVAC) systems that are responsible for controlling

air temperature, air flow, air quality and humidity become even more critical in the healthcare environment where the surrounding atmosphere can impact healing and recovery. Certain medical spaces also have specific requirements for pressurization and air filtration to control the spread of pathogens or other contaminants that can pose a safety hazard to patients and staff. HVAC systems are vital to meeting these requirements, as well as helping to control smoke in the event of a fire.

Hospitals and healthcare facilities must therefore follow specialized industry standards for the design of their HVAC systems that outline requirements for air flow, filtration and pressure differences.

While many commercial facilities exhaust HVAC return air into the negatively pressurized plenum space above the drop ceiling, hospital HVAC return systems are typically fully ducted, or enclosed. This means that air collected from each space is exhausted from the building via ductwork. A fully ducted HVAC system can offer better air quality and control over return air plenum, because air moving through the plenum space can come in

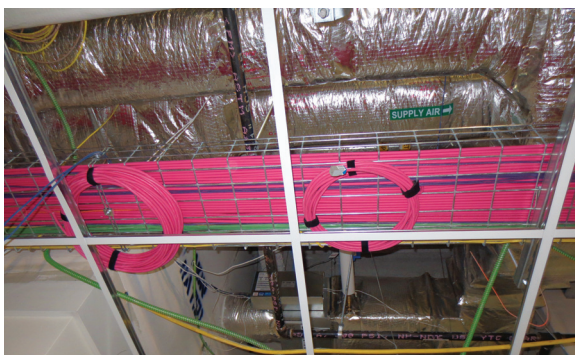
contact with pollutant sources.

When it comes to network cables that run in pathways above the ceiling, plenum-rated cables that meet more-stringent flame spread and smoke density requirements are required when the space is designated as a return air plenum space. While the use of fully ducted HVAC systems allows for deploying riser-rated cables, plenum-rated cables are still often deployed in hospital and healthcare facilities for enhanced safety. However, plenum-rated cables are significantly more expensive than riser-rated cables.

"For as long as I've been involved in hospital network deployments, it's been plenum-rated cable," says



Left-to-right: Lance Lines, CIS on-site project manager; Larry Smith, manager of data cabling with Mercy; and Eddie Ouellette, CIS site manager, inspect pathways within Mercy Hospital Joplin's intensive care unit.



General Cable's GenSpeed 10 MTP with 17 FREE technology, shown here installed in a fully ducted HVAC environment.

Larry Smith, manager of data cabling services with Mercy Technology Services (MTS). “Regardless of whether or not it was required, it has been the status quo in healthcare and education. Everyone wants to save money, and significant savings can be achieved by going with non-plenum, but we were concerned that in the event of a fire, the smoke generated would cause a health risk to patients, staff and visitors trying to evacuate the building.”

During the initial planning phase for the new Mercy Hospital Joplin and Mercy Orthopedic Hospital in Springfield, MO, there was some concern surrounding the high cost of plenum-rated cable, which was nearly double that of riser-rated cable. Instead of being faced with the high cost of plenum cable or the safety concerns of riser-rated cable, General Cable introduced a third option—17 FREE.

17 FREE cables are a unique class of halogen-free, riser-rated network communication cables that offer increased safety for occupants and yet cost only marginally more than traditional riser-rated cable for significant savings over plenum-rated cable. Available in Category 5e, 6 and 6A, 17 FREE cables are all made without halogens. Because these products do not contain halogens, they significantly reduce the darkness of the smoke. Additionally, the smoke produced has a significantly reduce halogen acid content, which may prevent costly damage to expensive and sensitive electronics equipment used in healthcare facilities.

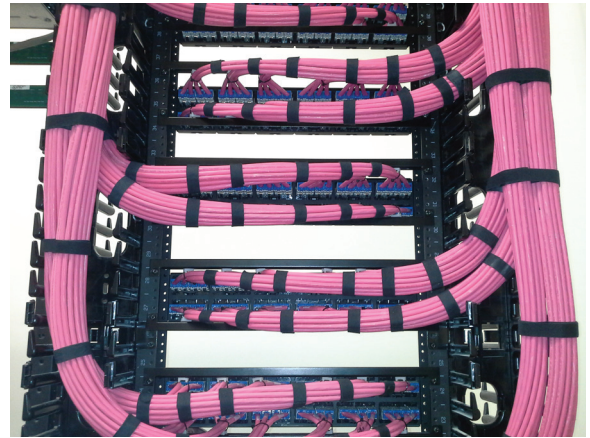
“Mercy’s Orthopedic Hospital in Springfield was in the design phase

when the tornado hit and destroyed the Joplin facility,” says Mark Alexander, RCDD, RTPM, senior project manager for the project and director of operations for CIS Data Services LLC, a technology installation-service company. “It then became a natural progression to look at solutions for both Springfield and a new hospital in Joplin. Our position is to offer the best solution for our customers, and while traditional riser-rated cables could have been installed, it was very important to Mercy that the cabling be consistent with maximizing their safety-driven philosophies. With 17 FREE, we were able to meet both goals of lower cost and maximum safety.”

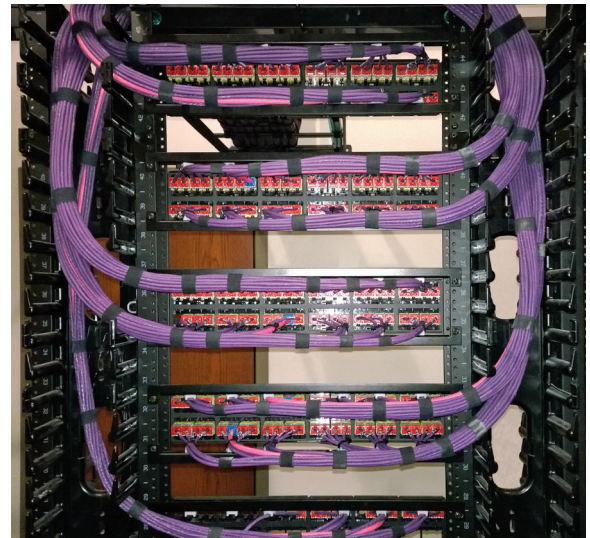
What makes 17 FREE cables safer? PVC consists of hydrogen (chemical symbol H), carbon (C), and chlorine (Cl), with other elements added to act as fire retardants (typically Bromine [Br] halogen), smoke suppressants and various other additives. Chlorine and bromine, which reside in the 17th column of the periodic table of elements within the group of elements known as the halogens, react with free radicals produced by fire when PVC is ignited. While this reaction greatly

reduces the ability for the fire to burn, it also releases fumes that turn into hazardous acids when consumed with water from sprinkler systems or moisture in the mucous membranes (eyes and lungs if inhaled).

While nearly all U.S. manufacturers use PVC in their cable construction, General Cable has successfully eliminated all halogens from 17 FREE cable while maintaining superior



This GenSpeed Category 6A System Solution with GenSpeed 10 MTP with 17 FREE horizontal cable is terminated at Category 6A Mini-Com TX6A jack modules in a telecommunications room at Mercy Hospital Joplin.



Shown here is a PanGen Category 5e system with 17 FREE and a PanGen Category 6A system with 10 MTP 17 FREE, deployed at the Mercy Orthopedic Hospital.

flame requirements, electrical performance and longevity. Incorporating General Cable's 17 FREE line of riser cables into Mercy Hospital Joplin and other Mercy healthcare facilities significantly reduces the release of halogen-based smoke in a fire scenario, while still meeting industry standards and providing a significant cost savings over plenum-rated cable. As a result, following deployment of 17 FREE at the new Orthopedic Hospital in Springfield, Mercy exclusively standardized on 17 FREE cable for Mercy Hospital Joplin and any future locations where non-plenum cable can be used, such as fully ducted HVAC systems.

"17 FREE saved us 40 percent on material cost versus plenum with nearly the same level of safety," says Smith. "Even though we could have installed traditional riser-rated cable, 17 FREE reduces the toxins and met our concerns for safety."

Performance done right

While 17 FREE cables meet the cost and safety considerations for Mercy, the hospital also demanded superior performance to deliver the very latest healthcare applications from the nearly 25 telecommunications rooms (TRs) spread throughout Mercy Hospital Joplin.

A combination of GenSpeed 10 MTP (Mosaic Twisted Pair) Category 6A cables and GenSpeed 5350 Enhanced Category 5e cables—both with 17 FREE technology—is deployed throughout the hospital to support everything from patient monitoring and interaction systems, telemetry and digital diagnostics, to



Left-to-right: Clay Shaw, General Cable; Eddie Ouellette, CIS site manager; Eric Ridinger, CIS supervisor; Mark Alexander, CIS director of operations; Rick Hornberger, Panduit; and Tom Dorweiler, CIS project manager.

WiFi, security, Voice over Internet Protocol and building automation.

The cable is terminated to Panduit Category 6A Mini-Com TX6A jack modules and Category 5e Mini-Com TX5e jack modules housed in Mini-Com modular faceplates at the work area outlets and in Mini-Com modular patch panels in the TRs. Equipment connections at both ends of the cabling are made using Panduit TX6A and TX5e patch cords. This combination of cable from General Cable and connectivity from Panduit form end-to-end PanGen system solutions that are designed to meet or exceed ANSI/TIA-568-C.2 Category 6A and Category 5e channel requirements.

The Category 6A PanGen system solution is certified to provide 10-Gbit/sec channel performance up to 100 meters, while the Category 5e solution provides reliable 1-Gbit/sec channel performance up to 100 meters. Both PanGen solutions

installed at Mercy Hospital Joplin are eligible for the PanGen 25-year warranty that offers 100-percent coverage to repair or replace defective components, compliance with all applicable ANSI, TIA and ISO standards, an installed channel performance guarantee and one point of contact.

Within the TRs that connect to two separate main equipment rooms via redundant singlemode and multimode fiber for network redundancy, as well as via 25- to 50-pair Category 3 cables for the voice system, Mini-Com patch panels and active network equipment are housed in Panduit's R2P 2-post racks and R4P 4-post racks, respectively. Horizontal and vertical cable managers from Panduit were also deployed to help manage the cabling.

To deliver 10-Gbit/sec performance as part of the PanGen solution, the revolutionary GenSpeed 10 MTP with 17 FREE uses a patented Mosaic Crossblock technology that encompasses individual overlapping

metallic blocks separated by an insulating layer of polyester film to shield the cable from noise coming from external cable sources, which can adversely impact data transmission performance. The cable also incorporates a separator to stabilize and separate each pair for optimized internal pair geometry and crosstalk performance, exceeding TIA 568-C.2 component standards while providing an overall smaller, easy-to-install round cable profile. Panduit's Mini-Com TX6 jacks also help ensure 10-Gbit/sec performance and exceed component standards using a patented enhanced Giga-TX Technology that optimizes performance by maintaining cable pair geometry and eliminating conductor untwist. The jack modules are also 100-percent performance tested and individually serialized for future traceability, and the wide range of available colors makes it easy to color code connections for various healthcare systems.

"The requirement for the new Joplin hospital was gigabit speeds to the desktop and the PanGen Category 5e system can provide that," says Smith. "However, we also needed the PanGen Category 6A system in select areas throughout the hospital that demanded higher bandwidth for video, imaging and other critical care applications. We were strategic and went with the higher-performing Category 6A system where it made sense and the Category 5e where we knew that was all we would need. For example, we deployed Category 6A in radiology areas and to WiFi access points since next-generation WiFi will require Category 6A."

In addition to meeting cost, safety and performance requirements, the PanGen systems proved themselves during and after installation, aided by superior technical and customer support.

"Our experience with the 17 FREE cable and the PanGen systems has been excellent, and we haven't had any issues with the installation. The installed cable has exceeded category specifications with the added safety benefit of being halogen-free," says Alexander. "And the level of customer support we received from Panduit and General Cable at the Orthopedic Hospital has helped to make Joplin that much easier."

While installing cable at the Springfield location, CIS crews discovered that the reel size for the cable was too large for their spool carts, requiring a racking system to be built. General Cable sent a team of engineers to the location to better understand the problem and make adjustments to ease installation.

"General Cable was very forward with addressing any concerns," says Alexander. "Upon request, we sent in videos and photos demonstrating the issue with the reel size. The next thing we knew, they were asking for clearance to come on site for a tour and to review and discuss the problem. General Cable then redesigned the reels and sent us demos. We provided feedback and now receive the cable on the new improved reels. That kind of support is exactly what we need."

Ready to serve

The Mercy Orthopedic Hospital in

Springfield opened its doors in August 2013 with the PanGen solution and 17 FREE cables supporting a variety of healthcare applications throughout the nearly 200,000-square-foot hospital, as well as helping to ensure occupant safety. While the 2011 tornado that destroyed St. John's Regional Medical Center was a terrible tragedy, lessons learned during the tornado are evident in the bigger and better Mercy Hospital Joplin, slated to open in March 2015.

In addition to the occupant safety and latest technology supported by General Cable's 17 FREE cable, the new facility is a hardened concrete structure that is positioned into the hillside for protection. It features strengthened windows, reinforced refuges on each floor and protected power from two separate sources that will allow the hospital to continue operation if another EF5 tornado hits.

"The Mercy Hospital Joplin project has progressed well. As with all projects, there are hurdles to overcome, but there have certainly been no show-stoppers so far," says Smith. "The backbone cabling is complete and several systems have been brought online. Not using traditional riser-rated cables has allowed us to retain the right level of safety while reducing costs. With 17 FREE, we are saving money and lives." ■■

Clay Shaw, RCDD is regional sales manager, communications with General Cable (www.generalcable.com).