ACCESS CONTROL STRATEGIES

Trend in the industry suggests future one-stop shopping

By Brenda Silva

INDUSTRY TRENDS SUGGEST BUSINESS-SAVVY ELECTRICAL CONTRACTORS may procure additional work by educating staff members about programming software for security systems, allowing their clients one-stop shopping for access-control systems installation.

In recent years, security has become an integrated part of what contractors deliver, along with communications and power. However, within the security industry, the ultimate contractual decision may be a question of after-sale servicing of a security system. This service is typically not offered by electrical contractors but, rather, by many security-system integrators responsible for a system's initial programming.

With the two trades involved, opinions are diverse about whether it is best to employ two separate companies or one that encompasses all the talent necessary to install a security system; the available options provide various possibilities for success in the security field.

Relationship building

The traditional relationship between the electrical contractor and the security system integrator has been one of separate trades providing different scopes of the overall project. The merging of these two specialties may become a reality sooner than expected with ambitious electrical contractors adding to their resumes with a variety of specialized software.

Debra Spitler, vice president of marketing at ASSA ABLOY Identification Technology Group, pointed out the different perspectives in the security industry and the roles they play in access control.

"There are always two different perspectives within the security marketplace: the role of the electrical contractor versus the role of the security integrator," she said. "In many cases, the security-system integrator will do everything associated with the job to make the system whole.

"The other side of the coin is where the electrical contractor is much more involved, especially during new construction," Spitler added. "The electrical contractor runs all the conduit and power for the job, and he may also have in his contract to run all of the wire for the job. Traditionally, this is

where the electrical contractor has stopped. He's run the wire and conduit for the job, but all the terminations, access systems, installations and hookups have typically been done by the security-system contractor."

So where is this relationship headed? One theory suggests sharing duties between two companies that have contracted to work together; another asserts the ease of finding all duties under one company's umbrella. Considering the various possibilities for the future, Spitler lists some of the likely scenarios.

"Right now, the big question is where is this convergence between the electrical contractor and the security-system integrator is going to come in. There are some scenarios that could continue where the electrical contractor pulls all the wiring and then stops," Spitler said. "It could be the electrical contractors pull all the wire and hang the equipment, like the readers on the wall, and put the electrical strikes in the doors, etc., and then the security-system integrator does the final connections and system programming. Or, the electrical contractors who are savvy could learn how to become full installers, and handle putting in the hardware and the software and getting everything programmed and operational. There really are so many options available."

Heightened technology

Since the events of Sept. 11, 2001, many companies that wish to increase security aren't satisfied with just burglar and fire-alarm systems. They are seeking systems that require heightened technology for installation and operation, such as retina or fingerprint scans, sensors, closed-circuit television, smart cards with encoded data, touch-screen monitor interfaces and wireless data-transmission systems that operate by remote control.

"Technology is moving into smart technology with smart cards and multiauthentication technology, such as the use of a biometric and a card," Spitler said. "Technology is becoming more diverse, and the diversity of the technology is even requiring a different skill set on the part of the security-system integrator because there are new software components.

Though everything is software-driven, she added, most electrical contractors could pick up a card reader or biometric device that came with a decent installation manual and understand how to mount the device.

"The big question is, 'What do you do to make it operational?'" she said. "Does the electrical contractor have a staff computer-savvy enough to understand how to make a device operational, as well as to understand how to work with a client who may not understand the principles of access control? Electrical contractors are good at explaining what electrical components are required in order to make systems operational, but they also have to be able to move into the role of explaining to clients about access control."

Outlook for electrical contractors

One question is whether the security industry will come to rely on the electrical contractor to become software-savvy or remain content to have the security-system integrator provide the benefit of one-stop shopping.

This issue has been reduced to which company will provide the necessary after-sale system maintenance. "Once electrical is installed in a building and operational, how many people need an electrician?" Spitler asked. "Once electrical is working, it usually doesn't break. Security is different because the security system integrators provide the after-sale service. They are typically very software-savvy in terms of how to program the access control software. Electricians, on the other hand, have been known to get the job done, but they don't come back to service it after the fact, and they are not typically thought of as software-savvy."

The electrical contractor's future in access-control systems has become a matter of how far he or she wants to go in learning the actual ardware/software side of the business and in offering the after-sale support and maintenance.

Within the electrical contracting industry, the consensus seems to be if contractors want to move into full-service, full-support roles within the access-control industry, they must employ staff members who know the software. The electrical contractor's future in access-control systems has become a matter of how far he or she wants to go in learning the actual hardware/software side of the business and in offering the after-sale support and maintenance. This may be a customer's major factor in deciding, though many may consider doing part of the work with the electrical contractor and the rest with the security contractor.

There are additional aspects to consider based on the location of the project. In strong union towns, many security-system integrators who work on larger new construction projects subcontract to the on-site electrical contractor. On new construction, union regulations play a big part in what happens, giving the electrical contractors an advantage because the security system integrator is limited and cannot perform a large portion of the job.

Ultimately, a security solution should enable a business to operate faster, safer and on a profitable level. This means electrical contractors and security-system integrators should remember that communications, controls and client needs—when combined—provide the customer with an effective security solution they feel secure with. **EC**

By Brenda Silva

'MIGHTY MAC'

MACKINAC BRIDGE RECEIVES ELECTRICAL UPGRADE

AT A COST ALMOST EQUAL TO ITS ORIGINAL CONSTRUCTION, the Mackinac Bridge received an extensive upgrade to its existing electrical systems, with the bridge's massive size presenting only one of the challenges to the project.

Located in Mackinaw City, Mich., the Mackinac Bridge, known as "Mighty Mac" and "Big Mac," connects the upper and lower peninsulas of Michigan over the five-mile-wide Straits of Mackinac, where Lake Michigan and Lake Huron meet. The bridge was originally constructed between 1954 and 1957 at a cost of $3.5 million, in response to demand for a faster and more convenient way to traverse the two peninsulas other than via ferry, the quickest option available at the time.

When constructed, the project employed as many as 3,500 men, with five eventually losing their lives on the job site by the bridge's completion. In comparison, the electrical upgrade employed 11 men, none of whom died during the course of the project, which was completed in less than three years.

Initial apprehensions

The scope of the Mackinac Bridge electrical upgrade encompassed a variety of duties for J. Ranck Electric Inc.'s Sault Ste. Marie, Mich., branch office. In addition to replacing the seven primary substations across the bridge, the upgrade included the installation of additional street lighting, the replacement of all bridge lighting, and the removal and installation of many miles of cable and wire throughout the bridge.

"The main challenge on a job like this is the height, because everywhere you looked, you had height to deal with," said William

Gets a Makeover

Crews from J. Ranck Electric install navigation lighting (above left) and a new primary substation (below), as part of a three-year upgrade project that took the company to new heights.

Faunt, project manager and estimator at J. Ranck Electric. He also noted that safety conditions differed from when the bridge was originally constructed."You didn't have flat land or ground to start from, and a lot of the project was underneath the bridge, where you had to use a lift and various types of apparatus to get from point A to point B."

Faunt said although all crew members were inside wiremen and had worked at extreme heights before, this project was an entirely new experience for many of them because of the specific hazards of marine construction.

"It was a first-time experience for all of them, and they were understandably apprehensive with regard to the height issue. But once they were tied off, they seemed more at ease," he said. "Even though they have worked at extreme heights before, it was nothing like on the bridge, where there is nothing between you and the water for 300 or 400 feet."

Helping to quell any fears was foreman Leonard "Ducky" Nelson, who was a young apprentice on the 1950s' bridge project. Faunt suggested that both Nelson's presence and prior knowledge of the bridge helped give the crew an extended perspective of the bridge's history.

"Our foreman's experience was definitely a help, although when they built the bridge, safety was not as critical as it is now. They did a lot of things that we could not do anymore, like walking the steel without a line on," Faunt said. "But it was definitely a help for him to be there because he knew how things were done in the past, which made his presence very beneficial to us."

Faunt added, "This was our first bridge project, and everybody is very happy, and, of course, one of the things that made everyone happy was that we didn't have any near misses with accidents. That was one of the best things about this project, that we were able to go through the whole thing and we never had one tragedy or even close miss."

PHOTOS OURTESY OF THE MACKINAC BRIDGE AUTHORITY AND THE MICHIGAN DEPARTMENT OF TRANSPORTATION

Mackinac Bridge Facts

Lengths:

Total length of bridge with approaches: 5 miles (26,372 feet)
Total length of steel superstructure: 19,243 feet
Length of Suspension bridge (including anchorages): 8,614 feet
Length of Main span (between main towers): 3,800 feet

Heights and Depths:

Main towers above water: 552 feet
Maximum depth of water at mid-span: 295 feet
Maximum depth of tower piers below water: 210 feet
Height of roadway above water at mid-span: 199 feet
Under clearance at mid-span for ships: 155 feet

Cables:

Total length of wire in main cables: 42,000 miles
Number of wires in each cable: 12,580
Weight of cables: 11,840 tons
Diameter of main cables: 24.5 inches
Diameter of each wire: 0.196 inches

With the electrical upgrade complete, J. Ranck Electric is working on another project with the Mackinac Bridge Authority that focuses on security throughout the bridge itself.

What the project entailed

Costing just under $3 million, the electrical systems upgrade project began in April 1999 and was finished in November 2001, a full six months under the three-year deadline. Weather conditions forced Faunt and his crew to work on the bridge between the months of April and November only.

"For this project, we replaced all seven substations under the bridge at both ends, which required new 5 kV cable that we had to replace all across the bridge," Faunt said. "We also replaced all the lighting on the bridge, as well as the cable lighting, the lights up on top, and all the cable that fed those lights and the receptacles.

"We installed four 100-foot light towers (480V) at the toll booth on the north end of the bridge, where two were already existing," he added. "On the bridge itself, we installed 183 streetlights that were each 40 feet tall. Then on the towers, we replaced all the aerial, navigation, aircraft warning and floodlights."

While each aspect of the electrical upgrade presented challenges, Faunt asserted once again that height was the biggest obstacle, especially with the tower lighting.

"The aerial lights are the vertical ones going up and down the cable (five-conductor cable); the navigational lights (480V) are at the bottom of the tower; the floodlights light the towers themselves; and the aircraft warning lights are the two lights on the top of each tower," he said. "We replaced all of these lights and the cable required for them, and at each stage, we had to be constantly be aware of the height and our safety."

Faunt explained how the tower lighting was accomplished through the use of a ladder within the towers themselves.

"We also replaced all of the receptacles up and down through the tower, and those towers are a long way up," he said. "I think there were about 15 receptacles (120V) on each side, for 30 receptacles in each tower, from the base to the top. The guys working on the receptacles had to climb a ladder to get to top of the tower."

One situation that stands out in Faunt's mind was the problem of installing the aircraft warning lights at the top of each tower, because of the size of the lighting itself.

"The aviation lights were so big that they did not fit through the area the guys were climbing up in, which was the equivalent to a manhole placed at every 20 feet of the ladder, all the way up to the top. So the lights had to be broken down to be carried through, and then reassembled once the guys reached the top," he said. "To put it in perspective, at the top of the ladder, there is 500 feet between the guys and the water, and 350 feet between the guys and the deck, which is the same as 23 or 24 stories."

Charlie McKechnie, lead journeyman on the project, added that the one thing he will remember most is the vision of eight men walking single file on the steel, carrying cable on their shoulders while on their way to pull vertical aerial cables.

Additional hazards

In addition to numerous lighting replacements, the J. Ranck crew also installed a foghorn, a platform and two generators as part of the upgrade.

"Right in the middle of the bridge, there is a foghorn, and it is electronically controlled for shipping; we installed the foghorn and a new platform for it," Faunt said. "The generators were brand-new generators, relatively small, maybe 100 kW, which control signs that, prior to the bridge, tell truckers what the wind velocity is and how fast they are supposed to go.

"We also removed and replaced 14 miles of 5 kV cable, and 80 miles of low-voltage wire," he added. "The cable was all pulled horizontally for feeding the substations, fed from both north and south. The 80 miles of wire was installed both vertically and horizontally, although most of it was installed horizontally. In reality, the only vertical cable we replaced was up and down the towers."

While Faunt and his crew were busy at work, the Michigan Department of Transportation and the Mackinac Bridge Authority helped by securing lane closures, as the bridge could not be shut down completely.

"For us to be able to work, they had to have lane closures. So they always closed a lane for us to be able to go over the side," Faunt said. "We weren't able just to go out and do whatever we wanted, we had to have the lane closures in order to be able to look underneath to decide how we were going to pull wire."

However, as is the case with today's impatient society, McKechnie remembers that even the lane closures did not stop, or even slow down traffic while the crew worked nearby. Perhaps, now that all is said and done, it was not the bridge's height but automobiles and trucks that posed the greatest threat to the men's safety. **EC**