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Illegal Intruders Outfoxed by the FOX II and TIRIS Technology

It may be impossible to outfox James Bond and his cinematic successors who use brute force, gymnastic wall-scaling, and clever pyrotechniques to gain entrance to seemingly impenetrable castles. But then, that's Hollywood.

But outfoxing real-life day-to-day attempts at gaining entrance to site perimeters of manufacturers, commercial airlines, chemical plants, and other firms with physical complexes is a very real problem that confounds the security pundits constantly: How do you keep illegal intruders out without overwhelming your budget and burdening the very people you want to provide access to?

The Big Question

That's a question that Rohm and Haas, Texas, Inc., a chemical manufacturer near Houston, struggled with. In addition to guarding against unauthorized entry, the company had to be able to fully account for every employee at any one time because of the inherent danger and risks posed by the products it manufactures.

The issue was also a matter of regulatory acceptance. OSHA, the federal regulatory arm that oversees the administration industrial health, prefers that all employees of a chemical manufacturer be accountable at all times while on site.

The Rohm and Haas, Texas, Inc. plant has always had a safety dispatch control center, but the company wanted to ensure that in the case of an emergency every employee and visitor could be quickly and efficiently directed to the right exit. The company wanted to give personnel the ability cope with the situation no matter where they might be in the plant. Ideally, the company wanted to be able to press just one button to secure the safety of its people.

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To that ends, training and a good security work force covered the bases, but with a constant flow of visitors, Rohm and Haas, Texas, Inc. knew it had to find an even better way of ensuring the security for all without burdening them. Processing and checking paperwork of incoming visitors slowed everyone down. Inevitably, some "pals" were waived inside with less scrutiny than others, subjecting the system to some error and potential intruders.

Yet, Rohm and Haas, Texas, Inc. was hesitant about using automation. Security Director David Ghormley recalled, "It was a big risk for us to use automation. Lots of other changes ordained by different regulatory requirements were going on in the plant. Bringing in a new security system was an additional risk. We had already tried magnetic stripe, which lasted only six months. It required too much interaction."

The Answer: FOX II with TIRIS RFID

Rohm and Haas, Texas, Inc. found their answer in a new security system based on radio frequency identification (RFID) technology from Texas Instruments TIRIS. The FOX II security system, developed and manufactured by Security Electronic Systems, Inc. (SES), of Wichita, Kansas, provides total, unattended control over personnel entering and exiting a facility or complex. Without breaking pace, employees can enter and simply walk through a locked-entry turnstile. Once an authorized personnel gains entry, no one else can piggyback on the user's ID by re-using the badge again. Nor can two people squeeze in at the same time using only one badge. The system can also lock out anyone carrying firearms. An additional module prevents materials theft.

In a year since the system has been installed, employees have gained access one million times with no guard present. Rohm and Haas, Texas, Inc. has saved close to a quarter of a million dollars it normally would have spent on guards. And throughput has increased tremendously: Prior to installing the FOX II system, lines formed as guards checked each individual one nby one. Now, with FOX II, the sophisticated RFID technology permits between 70 and 80 employees to go through the turnstile in one minute.

Ghormley again: "When we introduced the Fox II and TIRIS transponder tags, we went from low security to high security overnight. It was so successful because it is easy to adopt. People

don't have to do anything!” What Rohm and Haas, Texas, Inc. experienced first-hand was one of the great advantages of RFID technology—it is transparent to users.

Speedy and Efficient

The system consists of a pod-like self-contained unit that in its entirety becomes part of the perimeter structure. Structures, such as fences, can be secured to the unit. Employees and other authorized personnel enter a tunnel that houses a floor-to-ceiling turnstile. Using RFID-based badges, authorized personnel can walk through the turnstile hands-free. In fact, the badge does not have to be removed in order to gain entrance. Each verifeid personnel gets a green light and a voice message to signal an authorized entry. Information about the entrance, exit, and flow of each authorized personnel is sent in real-time to the safety dispatch control center, which now manages the system and access authorization.

Because this is a real-time, online personnel ID and management system, changes to authorization can be made immediately. This is especially useful if an emergency occurs within the physical complex. For example, a fire might break out. Without turning off the system, firemen can be instantly authorized so that they can gain entrance quickly. Or an employee might fall and cannot be moved until EMS arrives. The system can be changed quickly to allow the emergency medical team rapid entrance and exit. Or for an employee identified as a problem employee, such as someone exhibiting violent behavior or suspected of theft, the ID badge can be immediately voided to bar entrance to the building or complex. Similarly, badges can be reauthorized immediately.

Rohm and Haas, Texas, Inc. installed an enhanced system available for internal plant security. This type of system is especially useful for complexes that have some areas with higher levels of security that restricts access to the general plant population. Using the same RFID technology and the same transponder-based badges, SES also sets up internal security for facilities that have different levels of access. The ID badges can be coded to recognize those who have access to higher security areas. Chemical manufacturers, for example, benefit from the ability of the TIRIS RFID technology to group employees based on the type of saety training they have received. Video surveillance cameras can also be included in the system to provide visual backup. Antennas and readers are mounted alongside all doors and entryways.

Because of the TIRIS RFID technology that the FOX II system uses, employees can be quickly located based on the last time the badge was read. Or, depending on the necessity, access to an area can be killed entirely. For example, if an usual number of visitors are expected, management may want to seal off certain areas for a limited time. The TIRIS RFID technology makes it easy to turn on and off access to key areas.

How the System Works

When a person enters the tunnel, infrared photoelectric beams signal the FOX Control Unit (FCU) that someone is present. In less than half a second, the FOX II system performs five key steps. First, the system verifies that only one person is in the tunnel. Next the system uses a radio signal to scan for the proper ID. Third, the system receives data from the TIRIS transponder in the user's badge. Then it checks the information against the database of authorized users. Finally, it unlocks the turnstile for one rotation if the ID is verified.

When transactions are stored on a host computer, data can be collected and patterns determined. In addition, badges can be categorized. FOX II provides event reports that include time and date stamps, tamper attempts, unauthorized entry attempts for badges that have been lost, terminated, or stolen, attempted passbacks, and power outages. For complete personnel management, the system can be enhanced by reporting to a host computer.

In case of emergencies, the system comes with a standard override. If a break in power is experienced, the system is automatically restored to operational status without any human intervention.

FOX II vs. Conventional Security Systems

Now compare the one-half second validation process that happens in a blink of the eye to one that is implemented by security guards. It's easy to see how the FOX II system using TIRIS technology not only makes the perimeter more secure but also less expensive. Based on security industry data, one perimeter access point that is guarded 24 hours a day requires 5.2 people to staff it. The FOX II system is on duty 24 hours a day, seven days a week, 365 days a year. Security guards are on 8-hour shifts, five days a week. When you factor in the cost of the security personnel salary and benefits, the FOX II pays for itself in less than seven months if only one security officer is replaced by one single-entry FOX II.

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Just as important, the FOX II is non-prejudicial-—entry is authorized only after verification. And in comparison to its human counterpart, the FOX II is error-free. The system can process thousands of personnel daily without encountering another human frailty—data overflow. Finally, the system provides an instant database on those entering the plant accessing that can provide a profile for each entry point useful to plant managers.

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