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ABSTRACT

This document outlines considerations in the selection of a cost-effective school-alarm system. Steps in the planning process include: conducting a district needs assessment; gathering input from all staff levels; consulting technical expertise; and selecting a security system that can be integrated with other site needs. It further describes the elements of an alarm system, the types of sensors and transmitters, installation methods, and specifications of the bidding process. Schools must also consider contracting issues, staffing responsibilities, cost, specifications for the bidding process, quality of the components, and staff authorization. (LMI)

SECURITY TOPICS

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As electronic wizardry continues to advance, improved technology and added features in alarm systems add up to enhanced protection.

That's good news for school districts, increasingly besieged with safety and security concerns. New ways to use alarms are increasingly in the forefront as part of the solution.

Yet alarm technology is only half of the equation for district administrators. The other half is finding the funds to purchase and maintain these systems. Schools faced with today's budget crises must cut costs everywhere, including security.

The answer for both problems lies in innovative, creative approaches to security that deliver a high level of protection at reduced cost. These systems are designed to keep costs down, while remaining viable and saleable to both the district administration and the community.

These advanced approaches not only result in an effective, cost-efficient system, but one that could well be self-funded.

This issue of Security Topics will introduce you to the alarm system planning process and provide examples of approaches that have worked for other districts.

From the time you realize you need a more effective alarm system, to having it installed, requires several steps, beginning with assessing the needs of the school district.

Ask yourself: what needs to be protected? Start by looking at local crime trends and the experience of other school districts. Compare that with your district.

Determine if you are trying to protect each school 100 percent, or if you just need to protect high risk areas, such as computer labs, science labs, music rooms and the administrative areas. Because most schools today have computers and audio visual equipment located throughout the campus, selective protection such as this becomes more difficult.

Some schools with limited budgets start out protecting basic facilities, then expand as more funding becomes available. While this usually costs more in the long run, it allows critical areas in each school to have protection and avoids the political problems that sometimes arise in protecting one school over another.

Designing an effective security system requires the input and involvement of all staff levels including district

security officials, facilities personnel, financial and fiscal managers, maintenance and operations officials, school administrators, teachers and ranking district officials.

As security consultants, we often meet with each principal in the district as we compile information for a needs assessment. We also talk with teachers, other personnel, students, parents and site committees. Gathering this information provides a perspective of need and helps pinpoint specific problems at each school. Knowing where past occurrences took place and areas that are most vulnerable at each site is especially important when designing a partial protection program.

Sometime during the planning process you should call in an alarm systems expert to lend technical expertise. With today's complex technology, alarm systems are constantly changing, making it difficult for district operations or maintenance people to maintain a high level of expertise. Because they have so many tasks to oversee, no one expects them to be current in all areas, especially one as complex as electronic security.

This expert could either represent an equipment manufacturer, an alarm company installer or be an independent security consultant. Each has their advantages and disadvantages, which you should examine carefully before making a choice. Base your decision on what you ultimately want in an alarm system. We, of course, are prejudiced toward consultants who are not affilliated with any particular product, only in designing the best system for your school.

When you begin looking at alarm systems, also consider how they might tie into other site needs. "Integration" has become the buzz word and a hot topic in the security industry today. It has to do with combining your alarm system with other systems and functions.

Other systems that combine well with security systems include these:

• Energy management systems (EMS) - In one Northern California district energy management started off as a small part of the security system. Eventually, costs for the combined system reached $5.5 million, but energy savings in seven years will pay for both systems. Meanwhile, the district receives the benefits of 100 percent energy management and security.

Additionally, the new system will generate more than $500,000 in positive cash flow over the next 10 years. Essentially, this multi million system will cost the school district nothing and produce cash that can be used for other security programs.

• Access control - Some school districts use photo identification cards for secondary school students, but use of access control systems in schools has been limited. Some systems control staff access to administrative facilities after school hours, including controlling alarm systems with access control cards.

• Closed-circuit television (CCTV) - These systems, like access control, do not enjoy widespread use in schools, but present some interesting possibilities in monitoring school facilities.

Typical elements of a security system include only two major groups of equipment for an effective alarm - the on-site hardware and the monitoring systems.

You will be most involved with the on-site hardware at each school. The monitoring equipment is housed at a central station, a 24-hour manned facility that receives and interprets alarm signals from each school. An alarm company can operate the central station by including the district into its umbrella of clients, or the district can own and operate its own central station.

The major component that makes up your protection system is the control panel. Most control panels use microprocessor based electronics, which allow a variety of programming changes, including configurations, added features and user access codes, without replacement or modification of the hardware.

Many control panels may be reprogrammed remotely, allowing reconfiguration of the software from the district maintenance office, alarm company or other distant site. This feature dramatically cuts service time and reduces system down time.

Typically, the control panel includes an emergency power supply to ensure continuous operation. The panel supervises this power supply and signals the central station if it becomes low.

Before choosing a control panel the rest of the system should be designed, interpreting the needs of the district sites. Select a control panel that meets those needs and the district's future expansion. Growth is a fact of life that must not be overlooked when selecting the control equipment. If you forecast future security needs in the initial planning, costly equipment upgrades can be avoided as growth dictates change.

Installing an alarm system in a school that previously had unrestricted access after hours can cause concern and frustration among teachers and other personnel. Most districts want alarm systems to preserve and enhance the learning environment, not to restrict teachers who often work long hours on their own time. So careful planning must take place to ensure that the system meets the needs of both the district and its personnel.

While an alarm system is comprised of many elements, the system user 's satisfaction is keyed to how it turns on and off. Choosing the correct device or method will either create or relieve anxiety over use of the alarm. Here are some options:

• Key controlled - out-dated and rarely used.

• Digital keypad - uses a numerical code to arm and disarm the alarm system. Some panels have the capability of multiple user codes, which allow a record of who armed or disarmed the system at what time. That information is logged into the memory of the control panel for later retrieval, or is transmitted to the central station. Transmitting information to the central station allows a number of different management reports to be available. Some sophisticated control panels coupled with digital keypads can restrict the day and time that access codes are valid, giving the district greater control over after hour access.

• Access control card - controls the alarm as well as allowing access through controlled entrances. Like the keypad, this method can be capable of leaving a trail of information for later retrieval.

• Remote communication - allows the alarm to be armed or disarmed from a remote site, such as the central station. This system helps personnel who are unfamiliar with the system, or who use it infrequently. All they need to do is call the central station and the alarms will be armed or disarmed remotely. Usually the caller must use a prearranged code for identification to have the system disarmed. The alarm can be programmed to automatically rearm itself after a specified amount of time.

This method is also useful for recurring events, such as community use of a multi-purpose room. For example, you could program the alarm system to automatically disarm a selected area every Tuesday evening for a 7 p.m. event.

The first line of defense against intruders is usually sensors on perimeter doors. These magnetic sensors are available in a variety of configurations, including surface and recess mounting. Care should be given to the type you select, because sensors are exposed to the most use and abuse.

Motion detectors are popular for protecting the interior of school buildings. While a wide variety are available, the two most commonly used are passive infrared and dual technology detectors.

Passive infrared (PIR) senses body heat to detect intruders. PIRs are designed to reduce false alarms from a variety of sources. One caution, however, is that in warmer climates you must use a high quality sensor that contains temperature compensation circuits to avoid the unit from becoming less effective as the ambient temperature in a room grows warmer.

For example, in the summer when an unoccupied classroom reaches 100 degrees or better, the range of detection may be diminished without a properly designed sensor.

Dual technology detectors, which are becoming increasingly popular in school settings, combines two forms of detection, usually passive infrared and microwave. Both sensors must trip to sound an alarm, which eliminates the potential for many false alarms. These sensors are more expensive than single technology sensors, but are a good investment in reducing the potential for false alarms.

Both types of sensors are available in a variety of detection patterns to provide optimum protection in classrooms, long corridors and other areas in educational facilities.

A third class of sensor used commonly in schools is the audio detector, with two primary types. One detects glass breakage, while the other uses a microphone linked to the central control panel.

The first, typically mounted on the ceiling, is electronically tuned to sound an alarm if it hears various types of glass breaking.

The second audio detector is a microphone connected to the control panel, which contains circuitry that generates an alarm when a pre-set threshold of sound is reached. These sounds are not limited to breaking glass, but will detect other sounds that may occur during a burglary. Not only does this system generate an alarm signal to the central station, it also allows the operator to listen through microphones to sounds coming from the site.

While monitoring alarm signals is a chief role of the central station, determining how the signals will be transmitted is a function of system design. The options are the same, no matter if the service is contracted to a vendor or in a district-operated central station.

The most common method of transmitting alarm signals is with a digital communicator. Typically built into the control panel, digital communicators use an existing telephone line when an alarm is sensed and electronically transmits to the alarm-receiving computer at the central control station.

Once the connection is made, the two devices interrogate each other and the digital communicator reports the site location, type and location within the facility of the alarm. The central station computer interprets this information and displays it to the central station operator.

Digital communicators have several advantages. Because they use standard and existing telephone lines, you needn't pay an on-going fee for a communications link. The dial-up network is extremely reliable, with automatic routing around circuit problems, should they occur.

Additionally, if you want to change central stations it is a simple matter to reprogram the digital communicator to the new station.

Disadvantages revolve around one of its advantages - the use of standard phone lines. If the lines are cut, or fail, the alarm cannot transmit to the central station. While that may appear as a weakness, rarely are telephone lines cut in low to medium exposure premises, such as schools.

If your district needs a more secure signalling path, then use a dedicated, or multiplex telephone circuit. This system connects a hard wire link to the central station. If the line is cut or experiences a technical failure it signals the central station. However, the cost to maintain a direct line could run into several hundred dollars per month. Moreover, since telephone companies are eliminating their hard copper circuits in favor of fiber optics and other technologies, it may be impossible to get a dedicated line.

A multiplex line, on the other hand, provides a high level of security, and is more affordable. The multiplex is a high security party line with a number of alarm systems using the same circuit to transmit to the central station.

Circuitry built into a transmitter at each site and receiving equipment at the central station polls each site every few seconds to ensure that the telephone link is secure and that no alarms have occurred since the last poll. Because this is a separate communications link, the telephone company charges an additional fee. Moreover, the equipment at each site is more expensive because of the addition of a multiplex transmitter. Unlike the digital communicator, a multiplex transmitter is not included in most alarm control panels today.

Radio signals present still another possibility for transmitting alarms to the central station. Compared to other technologies, radio is relatively new to the alarm industry. In most instances radio backs up the digital communicator if the line is cut.

Radio transmitters range from a simple slave unit that transmits to the central station, to more sophisticated, two-way systems that can arm or disarm the system or perform other remote controlled functions by relay.

Some school districts, such as in West Palm Beach, make extensive use of radios in their security programs. It takes a close examination from both a fiscal and operational standpoint to determine if this technology is right for your district.

Another design decision that will affect the kind of equipment you choose is whether the alarm will sound at the school or just silently alert the central station.

Silent alarms give responding police or security forces a better opportunity to apprehend the criminal, but also contribute to more false alarms. Someone who has authority to enter a building or classroom may unknowingly trip the alarm, and thus cannot take steps to abort a police response.

Conversely, audible alarms minimize theft and vandalism. A sounding alarm dramatically cuts short the amount of time a burglar or vandal spends inside a school facility. To maintain good community relations, however, the alarm should sound for a brief period of time and then reset. Most control panels have this capability built-in.

As the possibility for violence in schools increases, district officials are looking more toward electronic devices to ensure the safety of students and teachers, alike. Some schools are upgrading to voice communications systems, while others are installing personal protection alarms.

Teachers can wear miniature radio transmitters that summon help discreetly by simply pressing a button. A signal is transmitted to the office pinpointing who needs help and where they are. Another approach is to mount panic buttons in each classroom. Though less expensive than radio transmitters, the false alarm rate is significantly higher because these buttons are accessible to students, as well.

As you continue to analyze your security needs, you should determine which support service will be contracted out and which will be performed inhouse. Your first consideration is installation.

Some districts contract for that service because they lack the maintenance personnel to install a district-wide system in a reasonable amount of time. On the other hand, districts can become proficient in security systems by

doing it itself.

A Southern California school district contracted for a new system, then wound up completing the project after the installer went out of business. Today this district installs, maintains and monitors all its systems. Installing new systems helps create inhouse staff that is capable of maintaining, expanding and reconfiguring the system when changes are required.

Typically, the district staff maintains security systems, once they are installed. So if an outside contractor installs the system, be sure the bid includes teaching district staff how to trouble-shoot and repair its components. A well-trained inhouse staff can save the district money. For example, they will learn that control panels contain sophisticated zoning capability, which makes it easy to locate and replace a defective sensor. The staff will also learn to stock spare parts so that repairs can be made quickly and efficiently without interrupting alarm protection.

Monitoring the alarms is an area that requires the most thought, and usually results in the most debate. Most districts contract those duties to an alarm company, but a growing number are establishing inhouse central stations. Monitoring district alarms is a growing and on-going expense.

The cost of staffing a 24-hour, seven-day-a-week central station is substantial, in addition to the initial cost of acquiring the monitoring equipment. The cost issue can be examined in an unemotional, analytical manner, but other issues are a bit more thorny.

For example, alarm companies monitor a variety of customer alarms, often numbering in the thousands, making it difficult to give the same level of service an inhouse district central station provides. Because the district station deals only with school sites, staff becomes familiar with personnel, operating schedules, special events and other activities that affect alarm system operation.

Familiarity helps to substantially reduce false alarms because district personnel in the central station have the discretion in dispatching that an alarm company lacks, primarily for liability reasons.

You may consider a number of approaches to monitoring alarms. For example, we have developed hybrid programs for districts that combine in-house and contract services. This gives the district flexibility and saves money.

For another district we suggested a wholesale central station that supplies monitoring services to smaller alarm companies that cannot afford to operate their own central station. The district paid a fraction of the monitoring fee that an alarm company would normally collect and received a high level of service.

Another approach is to pool the resources of several districts. One district operates the central station and monitors the other districts' alarms under a cost sharing arrangement. Several districts actually turn a profit monitoring other district's alarms.

Once you have decided the type of alarm system you need and who will monitor it, you must next decide who will respond when an alarm sounds. The ideal situation is to have district police or a properly equipped security department respond. No one knows your district or its schools better.

On the other hand, districts without police or a security department simply call police. But unless the responding officers are familiar with the school they may find it difficult to locate the source of the alarm, even with accurate zoning information.

Often, police response to an alarm lacks high priority in many communities, leading to delays. Moreover, false alarm fines become a concern when local police respond.

One approach is to hire a contract security company to investigate alarms. Some districts have found this an effective way to virtually eliminate false alarm fines; guards responding are more familiar with the campus than local police. Fees vary for this service, and may range from a monthly service fee or by the response.

Many districts use a call-out system to dispatch a custodian to the school to meet police, direct them to the alarm site and provide police with access. But this method could be expensive, since bargaining unit agreements may dictate minimum pay or other terms that may exceed the cost of a false alarm fine or private guard response.

False alarms are a source of aggravation and friction between alarm companies, police and you as the representative of the school district. They are the embodiment of the little boy who cried wolf too often. If you like lively discussions, try talking about false alarms with an alarm company representative or your local police.

Police and alarm companies even square off over the definition of a false alarm. Unless forced entry is apparent, police usually label it a false alarm. Alarm companies, on the other hand, say that the alarm was only doing what it was meant to do - scare off the burglar.

The same budgetary crisis that has befallen school districts is also affecting municipalities. False alarm fines are a new way of generating municipal income. Cities that have not had false alarm fines in the past are now aggressively implementing them.

A California school district was upgrading its alarm system from 14 percent protection to 100 percent. Based on past fines, that upgrade would likely have resulted in increased false alarms with penalties exceeding $30,000 a year, illustrating that fines should be considered in the overall program cost.

However, the credibility loss in an alarm system is more serious than monetary losses. Too many false alarms can strain your relationship with police, who should be your ally in combating crime.

So consider the impact false alarms have on your budget and your credibility as part of your preliminary investigations. Once you've completed your research and analysis, you must then reduce those needs into specifications for the bidding process.

Typically four types of specifications are used. They are called descriptive, performance, reference standard or proprietary. We as security consultants prefer the latter.

Proprietary specs call out a specific device by manufacturer's name and model number, along with substitution of approved equals. This gives consultants the greatest opportunity to ensure the quality and functionality of the system.

District bidding documents provide a guide for the new system, but alarm systems and monitoring specs have a few unique points of their own. For example, the installation techniques, such as concealed wiring and the use of conduit for exposed wiring, prevents vandalism and tampering.

Moreover, because security equipment is a favored target of mischievous students and vandals, other precautions in the specifications also are necessary, such as requiring concealed sensors, recessed mounted motion detectors, mesh ball guards, and tamper resistent screws.

Furthermore, most alarm companies won't sign a standard district contract or be governed by the typical language of a purchase order. The contractual requirements of the alarm company's insurance carrier usually precludes the company from executing contracts without specific exclupitory language that limits the alarm company's exposure to liability. This factor requires consideration and negotiation with your vendor.

A final consideration of your new alarm system is the quality of its components. System hardware is almost

universally Underwriters Laboratories or UL approved. All devices, hardware and wire you have specified should be UL listed. Additionally, UL lists alarm installations and central stations.

High-risk sites, such as a jewelry stores, are required to install UL certificated security systems. On the other hand, schools are not required to have security systems that meet those standards. But you may wish to specify that the central station that monitors your alarms be UL listed. That will ensure you that the facility meets rigorous standards including construction, fire safety, back-up power and staffing.

As mentioned earlier, training is a vital aspect of your new security system. Be sure that adequate training is specified in your bid documents.

All personnel authorized to have after-hour access should receive initial training. Lacking that, false alarms will undermine the credibility of your new system. Either thoroughly trained district personnel or an alarm company representative should provide training at individual sites.

Authorized staff should also receive written instruction, preferably wallet-size, because it could be months between learning about the system and finding the need to operate it. The caveat to providing written instructions is that the person will likely write down the combination to the alarm system so not to forget it. So be sure and leave all logos and other identifying marks off the instruction card. You must also establish a program of follow up training, which may be either periodic or in response to a rash of false alarms.

Maintenance and installation provides another aspect of training. If you are buying equipment to establish your own central station, it will likely include monitoring software. Here, too, you should receive complete training in the initial set up and use of the system.

Because most companies offering alarm monitoring software offer support and upgrades you should specify those items in your bid documents. The support agreement should be between you and the software supplier, without the alarm dealer in the middle.

Most school systems have some sort of alarm protection now. It may be a collection of alarms from local vendors protecting key areas on a variety of campuses. If you have decided to upgrade, it's best you take an overall look at your security system as though you were starting from scratch. This is an ideal time to evaluate your entire security program and the alarms that are part of that effort.

Electronic technology is more than sophisticated gadgetry. It is your key to improved safety throughout your school district, while potentially paying its own way.

ABOUT THE AUTHOR

Steve Kaufer, CPP, is a Senior Consultant with Inter/Action Associates, with more than 19 years in the private security industry. He is the author of the "SAFE: Security Action for Education" audio cassette program and "99 Tips for Safe Schools." Steve Kaufer is a member of the Association of School Business Officials International, Council for Educational Facility Planners International and the National Association of School Safety and Law Enforcement Officers. He is among a select group, numbering less than 3,300, who have earned the designation as a Certified Protection Professional (CPP) by the American Society for Industrial Security. Steve Kaufer meets the rigorous educational, professional and ethical standards of the International Association of Professional Security Consultants and is a member of that group and serves on its Board of Directors.

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