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Systems

Volume 1, Issue 2

GETTING STARTED RIGHT

As the new fiscal year opens, many of you have either received or are anticipating receipt of funding for security installation projects. After months of planning and a substantial investment in the development of system design documents, the project now shifts to a new phase. Very few installation phase activities are as important as the project kick-off meeting.

Immediately upon execution of the contract, a meeting should be scheduled with all interested parties to discuss all aspects of the project. Items to consider include:

• **Attendees:** The attendance list is very important. From the contractor's side the project manager and the lead technician must attend. Depending on the size of the project, the contractor's senior management should be present. The list gets longer for the owner. Certainly, the owner's project manager must attend. Additionally, the following functions should be included:

1. **Facilities Manager:** The contractor needs to know who to contact for facility related questions, issues, and repairs.

2. **Safety Manager:** The contractor's activities will be monitored for compliance with appropriate safety requirements. The point of contact for these issues needs to be clearly identified.

3. **Utility Manager:** What are

the requirements for obtaining a lockout permit? What is the procedure for getting a new service drop? Is a trenching permit required for exterior projects? There needs to be a clear point of contact for these issues.

4. **Accounts Payable:** This one is obvious. Contractors need to get paid.

• **Agenda:** This is the time to review with the contractor all of the requirements in the project specifications (which now form a large part of his contract).

1. **Scope:** Make sure the actual work to be performed is understood.

2. **Equipment Requirements:** Review any special or crucial equipment-related requirements.

3. **Work Day Restrictions:** Some organizations restrict work hours to something other than 8 to 5. An escort may be required (and in some case clearances) to enter certain areas. Make sure these restrictions are clear.

4. **Testing:** Your specifications should include a requirement to test the installed system. (If they don't, don't bother with the kick-off meeting.) Make sure the contractor understands that the testing will be point by point, documented in writing and successful completion will be required before final payment is authorized.

• **Conduct of Project:** Establish how you expect the project to proceed.

1. **Schedule:** Require that a schedule be prepared for the project. Realize that a number of factors, many within your control, can impact the contractor's ability to keep to the schedule. Require the schedule to be updated weekly.

2. **Project Meetings:** Require weekly project meetings. Review progress made during the past week and ask the contractor to discuss (in detail) activities for the upcoming week. Comparing actual with previously projected progress is an excellent way to spot trouble maybe even before the contractor notices.

3. **Changes:** Changes are a fact of life. A project without changes is a project with latent troubles. Require the contractor to submit all requests for changes in writing. You must in turn respond in writing. Establish the process.

4. **Documentation:** Keep excellent records, schedule now to visit the project area weekly and record the work being done and changes from the last review.

5. **Develop a Team:** Develop a team with each member shouldering assigned responsibilities. Compliment when deserved and only criticize when it can be helpful. Deal with issues openly, quickly and decisively.

Remember, you, not the contractor, have to live with the results.

THE LONG AND WINDING ROAD

On page one, we talked about a crucial aspect of starting a security installation project, namely the project kickoff meeting. Now that the initial contractual and procedural aspects of the project have been defined in the project kickoff meeting, the real work begins. Here is what you can expect:

1. It will not go as planned. You are equipped with the most powerful project planning tools ever available. Your lawyers have concocted the most water tight contract ever envisioned. You have spent considerable time and resources developing a system design that will serve your defined requirements for the foreseeable future. In spite of all of this, changes will be necessary. Equipment will be delayed in shipment. Necessary facility related work will be bogged down because of a heavy schedule by the maintenance department. None of this represents failure on your part or incompetency on the part of the contractor. The key is to be flexible and keep the goal in sight.

2. Questions will arise. *I don't know why we didn't think of this before...* will be a phrase uttered more than once. As the system takes physical shape, things will become apparent that were not before. Benefit from the insight and

do what it takes to make the system better.

3. Everyone will become a security consultant. Everybody that walks by will have a better idea or present a foolproof way to *beat the system*. Keep the basic functional requirements in mind. Will the system accomplish the agreed upon functions? Is there really a vulnerability? If so, fix it. If not, push on.

At the risk of being redundant, it is important during this phase to exercise good project management skills.

1. Insist on weekly project meetings. They are never convenient and never seem important until problems arise. It is much easier to head off problems than to solve them after they have occurred with a multitude of ramifications such as project delay, budget problems, staff inconvenience and maybe even a trip to the boss's office.

2. Insist on an up to date schedule. The contractor should come to each weekly meeting with an updated schedule reflecting current project conditions. Compare the new schedule with the old. Discuss slippages, learn from accelerations.

3. Keep billing current. Encourage the contractor to bill on a periodic basis. This not only allows billing problems to

be discovered and resolved at an early date, it keeps your accounts current.

4. Do the job surveys. Survey the job on a periodic basis, probably weekly. Compare the current status to last week's status to gauge progress. Check actual work completed against the schedule. Discuss discrepancies at the weekly meeting.

5. Take pictures. Take copious pictures of the progressing project. Either buy a camera that puts the date on the picture or mark the pictures after you get them developed. (Better yet, get a digital camera and forget about developing film). The pictures could help resolve project disputes or answer questions about actual system installation at a later date.

6. Fulfill your responsibilities. Almost every project requires the owner to perform functions crucial to success. This may range from providing power to a particular area to assigning an IP address to a panel. Plan ahead and make sure these types of tasks are finished well before required by the contractor.

7. Build a team. A truly successful project does not happen with only one partner. Make sure every one involved is moving toward a common goal and is assisting every other team member to get there.

SYSTEM INSTALLATION: FINISHING THE JOB

After several months of weekly project meetings, schedule reviews (and changes), workarounds and change orders, the project is finished.

Not quite.

Notification from the installation contractor that the project is finished really means is that you have at least one more step to go: performance verification testing.

Disparaging comments aside, this is the home stretch. Everything is installed and has at least gone through a cursory check by the integrator.

This is your last chance to ensure that the system meets your functional requirements as defined in the specifications.

There are a few ground rules that need to be followed.

1. Performance Requirements:

Test the system to the performance requirements. These will be defined in the specifications or the project description.

2. Have a Plan: Develop a written procedure whereby the testing will be conducted. For example, know how you will test a magnetic switch on a card reader controlled

door. How will the card reader function be tested? On larger projects with multiple integrated systems, we often require the integrator to develop the procedures along our guidelines. On smaller projects, the process can be much simpler.

3. Test End to End: Provide a system stimulus (i.e., an alarm condition) and verify that the system responds properly. Proper end-to-end functioning is a good indication that all the pieces in the middle are working properly.

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ally takes two to do testing efficiently: one person in the field monitoring the alarm initiation events and the other at the console verifying results.

5. Record the Results: This may seem overly cumbersome, but a written record of actual system performance is invaluable. When your boss exercises his/her quality control prerogative, you can show him/her the results. If in the future a portion of the system is found not to be working, you may be able to determine when that portion of the system failed and why.

Let me illustrate. A procedure for testing a magnetic switch on a card reader controlled door might look something like this:

1. Test a magnetic switch.

A) Ensure that the door is in its normally closed state and that all egress devices are clear and not active.

B) Open the door without the benefit of a valid card read. This may require using a key to unlock the latch or by placing an obstruction between the latch and strike that prevents the latch from engaging.

C) When the door is opened, a door forced^d alarm should be generated at the host terminal.

D) Return the door to its normally closed state.

The user can usually customize the actual text of the alarm message. The text should include a definitive description of the alarm type as well as a unique description of the location of the alarm (i.e., *door 41, west wing*).

No doubt that acceptance testing can be a little tedious; however think about the benefits.

- This is a great way to familiarize the security staff with the configuration and operation of the new system.
- If any problems are found, they will

also learn the rudiments of system troubleshooting.

- The console operators during the test will get practice in handling the wide variety of system conditions that can be generated through field stimulus.

The test procedures can also be used in the future to ensure the system continues to operate according to the original requirements. Schedule periodic tests after system acceptance (We would recommend every six months) or have the roving third shift security officer test selected components on a six-month rotation.

Once the performance verification testing is complete, the system should undergo a *burn-in* or endurance test.

It takes a little effort but the end result is that you have a system that meets *your* requirements.

Now the project is finished.

The label applied to the alarm (*door forced*) may vary with the software manufacturer.

DIGITAL VIDEO RECORDING

It is hard to think of a product that has had a more profound affect on CCTV design and operation than digital video recorders (DVR's). Frankly, it is hard to keep up with the evolution of these devices, but here are a few items that have been crucial in previous design efforts.

- **Decide on a video sampling rate:** How many pictures a second do you need (not want). The options here vary from real time (continuous) video to less than one frame a second (jerky video). Although everyone wants the former, most can cost justify something approaching the latter. It all depends on your application. If you want to identify the person that just threw a brick through the window, one to two frames per second may be adequate. If your requirements

are more demanding, like actually seeing the hand reach out and grab the item and place it in his pocket, ten frames a second may not be unreasonable.

- **Decide on a storage capacity time:** In general, DVR's write to an internal hard drive. Once the hard drive is full, at least two things can happen:

1. The DVR will begin to overwrite the oldest data with the newest data.

2. The DVR will offload some of the data to a long term storage media such as a tape, CD, or DVD.

The size of the hard drive determines the interval between any of the above events. Actually determining the capacity (in time) of a DVR hard drive is difficult. It depends how the unit records events.

1. Does the unit record continuously or is recording triggered by an external event

such as a motion detector or a video motion detection algorithm?

2. Some units record a base frame and then record changes (updates) to that base. If there is a lot of activity in the field of view, more information will be recorded.

Actual field experience is necessary to determine the expected time-storage capacity of a DVR.

- **Go for simultaneous recording and archiving capability:** Select a unit that continues to record while it is writing to the long term storage media.

- **Be able to use the system:** Having just completed a side by side field evaluation of several units, this is the item that stands out. The technology is great; accessing the data from a PC turned out to be problematic in some cases. Before you

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commit to a long term decision, spend some time with your favorite choices to see which ones can be easily used by your staff.

- ***Make sure they can handle a power loss:*** The units must be backed up by a UPS. Some units recover perfectly from outages; others have a hard time. In normal applications, devices like these should have dedicated UPS's (\$150); it doesn't hurt to check how they respond to a loss of power, just in case.

- ***Think about the compression algorithm:*** Some formats preserve the information in the original video signal while others do not. Also, some DVR units require proprietary software for playback. There have been some instances where the authority having jurisdiction was unwilling to allow the proprietary software to be installed on their computers.

- ***Watermarking:*** This is where issues get somewhat uncertain. Some manufacturers use watermarking to indicate authenticity. The admissibility in court of digitally recorded images is still being established. A recent speaker on this subject cited the traditional chain of evidence procedures as crucially important. Close coordination with corporate legal counsel is important on this issue.

It is clear that DVR technology will quickly replace video cassette recorders for CCTV recording. Prices will continue to decrease while reliability and features increase. Ease of access over network connections make them ideal for remote monitoring by investigative staff.

