

BY RANDALL R. NASON



EYE in the SKY

The efficiency and cost effectiveness of a closed circuit television system is largely determined by the skillful selection, implementation and integration of all components of the system.

Of all the technological tools available to plant security staff, none are as versatile as the closed circuit television (CCTV) system. Used properly, the CCTV system can cost-effectively and efficiently leverage your existing labor resources seeing where you cannot be. However, based on our experience in providing security consulting and audit services across a broad spectrum of industries, the CCTV system can be poorly conceived and implemented, representing a significant cost center without proportional benefit. Therefore, it is important to understand the proper framework for effective utilization of a CCTV system and do it right the first time.

The rapid increase in CCTV camera capabilities and the somewhat dramatic decrease in cost have caused the expanded use of CCTV systems to augment security at food sites. At its simplest level, a CCTV system consists of four components: cameras, monitoring workstations, recording devices, and data transmission media. While all are essential, the usefulness of the system is largely determined by the proper selection and location of the cameras.

It is therefore important in configuring a CCTV system that clear requirements defining the purpose of each camera be developed. In other words, insist that each camera in the system meets a very specific security-related need and provides action-directed information. This not only makes the security management function more efficient but it also ensures that security-related expenditures are based on defined criteria leading to an enhanced security posture. For example, many organizations wisely install

CCTV cameras to record the passage of individuals, both employees and visitors, through the plant entrance doors. The function of that camera could be defined as: *To provide a clear view of all individuals entering the main plant entrance on a 24/7 basis.*

Conversely, there is often a tendency to install CCTV cameras to view the visitor parking lot. The purpose cited for these types of camera locations tend to fall into the *just want to know* category. Since most CCTV systems are not continuously monitored, the value of these types of camera locations

is less than others with specific functional goals.

Since the foundational reason to implement a CCTV system is to *see where you cannot be*, the first step in designing a site CCTV system is to make a list of areas that represent a security concern to site management and where you might locate security staff if those resources were economically available. These locations typically include:

- ④ **Site Entrances:** It is important to know what vehicles are coming and going from your site. A video record of all site ingress/egress activity can be useful in many areas such as to investigate an event and to verify deliveries and shipments. Depending on the perceived need, multiple CCTV cameras can be used to capture a picture of the car, the driver, and the license plate.

- ④ **Plant Entrances:** Similarly, it is useful to know who is coming and going from your facilities. Depending on the specific configurations of your facility entrances, CCTV cameras can be used to capture clear views of individuals entering and exiting the building.

- ④ **Process Areas:** Your process/manufacturing areas may be the most critical locations in the plant from a food security perspective. Strategically positioning CCTV cameras at the entrances to these areas allows you to view in real time or review on a historical basis individuals that came and went from these areas.

- ④ **Storage Areas:** Many raw ingredient storage areas are only visited by plant staff at certain times of the day. CCTV cameras can provide a video record of the activities in these critical areas.

- ④ **Bulk Unloading Stations:** These locations, sometimes located at the perimeter of the plant, are a recognized point of potential raw ingredient tampering and contamination. In many cases, there is insufficient plant security staff to be present during all bulk unloading operations. A properly specified and located CCTV camera can provide a video record of these operations for review as necessary.

- ④ **Laboratories:** Laboratories typically contain key records and certain chemical reagents that could be used to contaminate a food process. A CCTV camera can again provide a clear video record of activities in this area for review as necessary.

- ④ **Plant Offices:** The protection of your proprietary information is essential to the long term health of the organization. This type of information is concentrated in the plant offices. Strategically located CCTV cameras can provide a record for review as necessary.

- ④ **Electronically Controlled Doors:** In many instances, an electronic entry control system will be used to control access into many of the critical areas mentioned above. A security industry best practice is to have a video record of all activities at each controlled door. This can be accomplished by providing a signal output from the access control system that initiates recording of the camera viewing the controlled door. Integration of this type can be used to initiate video recording only upon detection of specific activities associated with the controlled door such as authorized opening, unauthorized opening, or an individual exceeding a preset number of invalid entry requests at the door.

In order to support CCTV camera operation, each selected camera location will need power and signal transmission cabling available. Depending on the camera equipment specified, there are a number of options.

- ④ **Power:** Depending on the camera specified, power requirements range from 120 volts AC to various DC voltages. With the finalization of IEEE standard 802.3af, power can be provided to networked CCTV cameras over the network cable. This power over Ethernet (POE) approach allows the network data transmission cable to also serve as the power distribution cable.

- ④ **Data Transmission Media:** The legacy data transmission media is the coaxial cable, identical in structure but probably not in size, to the local cable drop at your house. This type of media is appropriate for camera to signal processing equipment distances not exceeding approximately 750 feet. Because it is metallic, coaxial cable is also susceptible to electromagnetic



Food Plant Security

interference resulting in degradation of the video signal. Fiber optic cable is also widely used as it can be used over much longer distances than coaxial cable and is not susceptible to electromagnetic interference. However, the current trend is clearly toward digital networked cameras which use Category 5 or higher cable to transmit the digital signal over the IP based network. As briefly mentioned above, the recent adoption of 802.3af and the subsequent availability of POE devices will drive the further expansion of networked digital CCTV systems.

Lighting is also necessary for proper

Lighting is necessary for proper camera operation; however, the performance specifications of currently available cameras have greatly reduced the required lighting levels.

camera operation; however, the performance specifications of currently available cameras have greatly reduced the required lighting levels. Depending on the particular camera model selected, usable color video can be obtained at light levels which would be considered almost dark to the human eye. Light level surveys at the planned camera locations can provide the necessary ambient data so that an appropriate camera can be selected.

Most modern CCTV systems are digital systems using an IP based network as the transmission media. The CCTV monitors then become the personal computer workstation accessing the IP-addressable system components such as cameras and networked storage devices through a web browser.

The final component is the storage device. Current practice is the use of digital video recorders (DVRs) which are multiple camera input hard drive storage units. The CCTV signal is received by the DVR, converted to digital format if necessary, and then written to the hard drive. Most DVRs are sized to handle approximately 30 days of recorded video, although this number is largely a function of the risk profile of the organization. DVRs can be located in controlled equipment closets close to the camera loca-

tions. Specific video information can then be retrieved as needed, easing somewhat the system bandwidth requirements. Larger systems incorporate networked video storage (NVS) devices which are essentially network video servers used as the central repository of recorded video information subsequent to an archive action.

The efficiency and cost effectiveness of a CCTV system is largely determined by the skillful selection, implementation, and integration of all components of the system. While it all starts at the camera and that part must be chosen correctly, the remainder of the system must be properly matched to ensure best value security risk reduction. Integration with a site electronic entry control system enhances the value of the system by providing electronic indicators of security events that result in recorded video of the initiating event. **AIB**

The author is corporate vice president and manager of the Security Consulting Group of C.H. Guernsey & Company, Oklahoma City, Okla. His experience includes a broad spectrum of the security profession including threat assessment, vulnerability analysis and site surveys through complete system design and construction management. Nason's current and recent projects focus on critical infrastructure protection.

WE WRITE PRESCRIPTIONS

Visit Us At www.aibonline.org

AIB Registration & Orders:
800/242-2534 or 800/633-5137, 785/537-4750.

- On-Line Training
- Correspondence Courses
- CD Roms
- Books
- Videos

