Security Products

As Good as Gold

Electrical utilities combat copper theft with enterprise-wide video analytics

By Steve Birkmeier Jul 01, 2009

Preventative efforts are taken in every aspect of daily life—from emergency preparedness to purchasing insurance to installing home security systems. On a larger scale, physical security executives use mitigation programs to avoid hazards or disasters, which could affect the safety of their employees or disrupt services to their customers.

One mitigation technique for utilities is the supervision and protection of their facilities and resources. Security personnel and surveillance systems are often put in place to monitor restricted property and central facilities.

A typical CCTV surveillance system may record a theft or break-in, but by the time the video is viewed, the intruder has probably gotten away. Fortunately, there is a security product that can deliver the right combination of real-time detection and verified response required to address the situation in a proactive manner.

Intelligent video systems use a proprietary algorithm to identify abnormalities within a digital image, such as movement within a controlled space. They detect events based on the size, speed and time of objects within a predefined zone of interest. This allows the system to count and recognize objects, people and situations. Intelligent video uses video analytics technology to provide true object orientation and recognition, and to alert security personnel to changes within the space while ignoring nonessential information.

Raised Awareness

The last few years have witnessed a swell in the cases of copper theft as global demand for the resource sent the price for scrap to $4 per pound. Among the hardest hit victims have been electrical utility substations because of the large amounts of copper wire they use for electrical grounding and transmission. Also, the facilities are often remotely located and theft is difficult to monitor.

In addition to the cost of replacing the copper, the utilities must contend with the possible loss of power to customers and damage to transformers, which can cost millions of dollars to repair or replace. In some cases, the thieves are brazen enough to steal copper from working power lines and stations and, in the process, thousands of customers are left without power.

Many electrical utilities turned to intelligent video solutions. Motion sensors could detect and alert upon movement in an area, and standard video security could record a break-in for potential evidence. However, these two technologies cannot work together to provide realtime information to stop thieves in the act.

Video could be deployed with pixel-based motion-detection, but false alarms quickly become a nuisance, reducing the usefulness of the CCTV system.

IVS and its analytic technology enable a utility to set up virtual perimeters around the fence of its substation facility, as well as within it. Depending on bandwidth, any number of locations can be monitored without having to dedicate operator attention to all of the areas simultaneously.

If a dog wanders past the perimeter, for example, the system holds steady. If a man approaches, however, the system detects the size and orientation immediately and triggers an event. If the threat is deemed credible by alerted personnel, text messages and digital snapshots can be distributed with event details, and notification can be sent via cell phones and other handheld devices.

While many security measures are being used to reduce the problem of copper theft, intelligent video delivers the right combination of real-time detection and verified response required to provide a practical, efficient resolution to these dangerous thefts. That is why Arteco saw the need to educate utility executives about how IVS helps the problem—which is increasing costs for utility companies and ultimately the consumers— and lead the campaign to prevent it.

Arteco has worked since late 2006 to build awareness of the effectiveness of intelligent video in the utility industry. In 2007, the company launched a utility outreach program that included presentations at the ASIS Security Conference, as well as multiple webinars through various private and public venues to help educate both integrators and end users to understand how real-time video detection can be used to reduce copper theft incidents.

In 2008, Arteco was asked to address the Security Industry Association’s State and Local Policy Working Group concerning the alarming increase in copper thefts nationwide and its impact on the security industry. Arteco also has worked with various transportation, electrical and water utilities to install IVS as a proactive security measure.

Although copper prices have stabilized under the current economic climate and incidents of copper theft are down, the issue brought to light the success of using video analytics as a proactive security measure. What began as a solution to the specific problem of reducing the effects of copper theft on the utility industry has transformed into an organizational-wide security tool that increases the overall benefits received from video security.

A Multifaceted Solution

Utility companies now see the benefits that a real-time detection system with video verification can have across the corporate infrastructure. This realization comes with the understanding that every camera that is installed throughout the organization has a purpose. As a result, utilities that installed IVS technology to combat copper theft are now realizing many new benefits of intelligent video throughout their global video security environment.

Substation security is just one piece of the puzzle when it comes to the global security needs of major electrical utilities. Equipment depots, vehicle storage facilities, dam facilities and corporate headquarters are all locations that can benefit from the same real-time detection and alert capabilities offered by IVS

technology.

Organizations also are finding that video analytics plays a meaningful role in centralized video management from both a personnel and network resource perspective. These customers also are realizing that video analytics can have a cross-departmental value for internal departments outside of the security realm.

Managing Resources

On a personnel level, resources must be managed to ensure that cameras are being sufficiently monitored and security events are handled effectively in a timely matter. No other technology increases the effectiveness of security personnel while reducing required resources like intelligent video. First, it alerts personnel to incidents with multiple audible and visual signals when an event is taking place. This allows security operators to perform multiple tasks while monitoring the output of the cameras. In this way, the technology acts as a force multiplier, allowing fewer guards to monitor the output from many more cameras than could be achieved with standard video security.

Cameras also can be prioritized based on how many events take place at a given location over a specific period of time. For example, events from all of the cameras can be exported to a datamining program for statistical purposes. Security executives can determine which locations have the most incidents and when incidents are most likely to occur and allocate their personnel resources accordingly. They also can use the data to track the efficiency of their monitoring staff. Time-stamped data logs also follow which members of the monitoring staff acknowledged security events and the time-lapse between an event taking place and the time of acknowledgement.

Deploying video analytics systems also can help management effectively utilize network resources. The whole concept of intelligent video is built upon the idea that the system alerts personnel when events take place. This fact also is a crucial component when it comes to reducing the bandwidth consumption of an enterprise-wide video security installation. Video is a network-heavy element. Although innovation in compression methods continues to make video more network-efficient, these advances can be offset because the number of cameras installed at a location continues to increase.

Deploying video analytics allows utilities to reduce bandwidth consumption by only streaming live video when potential security events take place. Security personnel can be signed into multiple cameras across multiple locations waiting for security events to “pop” live video onto their screen to acknowledge an event. Limiting video to event-based streaming dramatically reduces bandwidth consumption when no events are taking place.

Cross-departmental Functionality

IVS technology also improves cross-departmental functionality. For example, field engineers who are not involved with security but are responsible for managing the production and output of different facilities throughout the organization can now have remote access to the cameras at specific locations. These managers have different user rights that do not allow them to view or acknowledge security events, but they do have access to live video at the site to gather operational data. Having cross-departmental relevance helps the budgeting process and, in many cases, can even help share the cost of procuring video analytics technology across multiple departments.

Intelligent video solutions are helping electrical utilities increase overall security by providing real-time actionable information when events take place. Utilities that first looked at the technology to help fight the problem have realized the benefits of having video analytics installed on an enterprise level.

About the Author

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