IP cameras help plant operators keep solar power flowing.
Firelight Infrastructure and Great Circle Solar use Axis cameras to protect and manage large solar farms.

Organization:
Firelight Infrastructure Partners & Great Circle Solar Management Corporation

Location:
Toronto, Ontario, Canada

Industry segment:
Critical infrastructure

Application:
Plant security and monitoring

Axis partner:
UCIT Online Security

Mission
Firelight Infrastructure Partners, a Canadian infrastructure fund with $300 million in capital to invest in renewable energy projects, works with Great Circle Solar Management Corporation to finance, own and operate solar plants in Ontario. Each plant inhabits 100 acres of open ground outside of smaller population centres. This seclusion necessitates a real-time security and monitoring system that operates around-the-clock, yet is still cost effective.

Solution
Firelight and Great Circle considered many options, including on-site security personnel, a ring of motion detectors and pan-tilt-zoom and/or infrared cameras. The best solution came from UCIT Online Security, an Axis partner twice named Axis Integrator of the Year in Canada. UCIT Online Security recommended a combination of thermal imaging and HDTV-quality PTZ and fixed network cameras.

Existing analog cameras were migrated to the IP video system using Axis video encoders. This delivers three critical prerequisites: large coverage area, durability and reliability.

Result
UCIT Online Security provides year-round monitoring. Staff have a clear view of the grounds if an alarm is triggered by in-camera analytics or motion sensors, and can contact law enforcement and warn intruders using loudspeakers and controllable lighting. So far, though, the systems' greatest return on investment has been as a day-to-day management tool. Solar cells must be free of snow and dust to effectively convert sunlight to electricity, and Great Circle and Firelight personnel can monitor the condition of the panels remotely and in real time. Without the cameras, costly trips to these distant locations would be required.

AXIS COMMUNICATIONS

"The Axis/UCIT Online Security solution has exceeded our expectations. We started out looking for a basic security package, but we ended up with a tool that allows us to improve our operations. This has actually turned into a project management tool, with security being the secondary consideration."

Adam Reeds, Director, Firelight Infrastructure Partners.

Business opportunity

The province of Ontario is eliminating coal-fired electricity plants by 2014. To encourage private enterprises to invest in renewable energy, the province offers fixed-priced 20-year electricity contracts for providers of renewable energy. "This branches away from the typical utility model and means independent power producers can now succeed," said Adam Reeds, director, Firelight Infrastructure Partners. In partnership with Great Circle Solar Management, a portfolio of three 10-megawatt solar plants have been built or are under construction throughout central Ontario.

IP cameras power live monitoring

A remote monitoring system was needed to provide security and check the status of the far-flung plants. A number of options were considered, including guards, motion detectors and the use of infrared and/or pan/tilt/zoom cameras.

UCIT Online Security, the Axis partner chosen for the project, monitors live more than 4,000 outdoor cameras across Canada. The company specializes in short-term surveillance initiatives like construction sites but, by contrast, systems at the solar plants had to operate for 20-plus years. "We needed cameras that are durable and cover a lot of space," said UCIT Online Security President Erik Mikkelsen. "Many would recommend infrared cameras, but typical infrared illuminators burn out every three to five years, so over 20 years you would replace them multiple times. Also, with infrared illumination you can only see 20 to 40 meters at night."

Mikkelsen recommended using a mix of high-definition and thermal IP cameras. "The Axis thermal cameras [chosen] can see up to 1,100 meters in complete darkness. So we need fewer cameras, less cabling and a lot less maintenance."

All three sites leverage AXIS Q1921-E Thermal Network Cameras with varying lens options for outdoor detection, and then use a mix of AXIS Q6032-E PTZ Dome and 1080p HDTV-quality AXIS P1346-E Network Cameras for detailed recognition.

AXIS M3204 Fixed Dome Network Cameras were selected to secure building interiors, and existing analog cameras were digitized using AXIS 7214 Video Encoders. The entire system is controlled by UCIT's own Detexi VMS.

Day-to-day ROI

While security was the main driver, it is no longer the main use. "Theft and security have not been an issue to date," said Noel McDonald, Associate, Great Circle Solar. "In fact, the cameras have been most useful from an operational standpoint. For example, if snow covers the modules, they generate much less electricity. With the cameras, we can check the sites remotely and send out staff when necessary."

The system also has security covered. Mikkelsen said, "If motion sensors or in-camera analytics trigger an alarm and we see trespassers, we can use the PA system to announce that authorities have been notified and they should leave. If it's a work crew, we ask them to call our office and explain why they're there."

Video is recorded locally and archived for a minimum of two weeks. During an incident, UCIT Online Security begins live monitoring and recording at its Mississauga office. "We can provide high-quality evidence to investigators or an insurance company in an instant."

Reliable and durable

UCIT Online Security was Axis Integrator of the Year two years in a row, and the company is committed to Axis products. "The equipment is very reliable in terms of service and maintenance," Mikkelsen said. "We've tried other cameras, both less and more expensive, and we've found Axis to provide an excellent solution to meet our clients' needs."

And the ROI has been clear, Firelight's Reeds said. "The Axis solution exceeded our expectations. We started out looking for a basic security package, but we ended up with a tool that allows us to improve our operations."

"Axis is an innovator in the IP space. We use Axis equipment to provide a service that takes work and worry off the plates of our end users. We create systems that deliver peace of mind," says Erik Mikkelsen, President, UCIT Online Security.