Video Surveillance Integrated with SCADA

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OEM: *Power* **RICH** *System*©*–***Enterprise Edition**

The purpose of this paper is to explore the growing security requirements for critical infrastructure in SCADA industries and the capability of operators to efficiently, integrate video surveillance into their existing SCADA networks without hindering communications and bandwidth to the control center.

CONTROL MICROSYSTEMS

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Background

Video surveillance has been around for many years, but in order to monitor remote assets dedicated communications infrastructure for the video signal is required and the associated costs are normally very high. In the traditional SCADA industries, such as water/wastewater, oil & gas, and power, it is common for customers to have field controllers or Remote Telemetry Units (RTUs), which monitor the signals from the process instruments making it possible to piggyback video over the existing communications infrastructure.

Regulatory compliance is also increasing, forcing customers to add video capability to monitor critical infrastructure and provide operators with an additional dimension in managing these processes. The American Water Works Association (AWWA) and Water Environmental Federation (WEF) have developed a three-phased program to address physical infrastructure security and video camera/CCTV is an obvious solution.

Integrating Video with SCADA

When existing SCADA systems have communication infrastructure in place, such as radio networks, the video cameras can be connected to local video server software and send video images to the SCADA computer when abnormal conditions occur. This way the SCADA network is not used for continuous video stream and conserves bandwidth. When motion is detected an alarm is raised and the cameras record both image snapshots and video event clips during the period of motion. Video cameras can be setup with pan, tilt, and zoom (PTZ) controls so the operator can more efficiently investigate the alarm without having to physically be onsite.

The SCADA display below shows real-time data incorporated with video image of a pump station site.
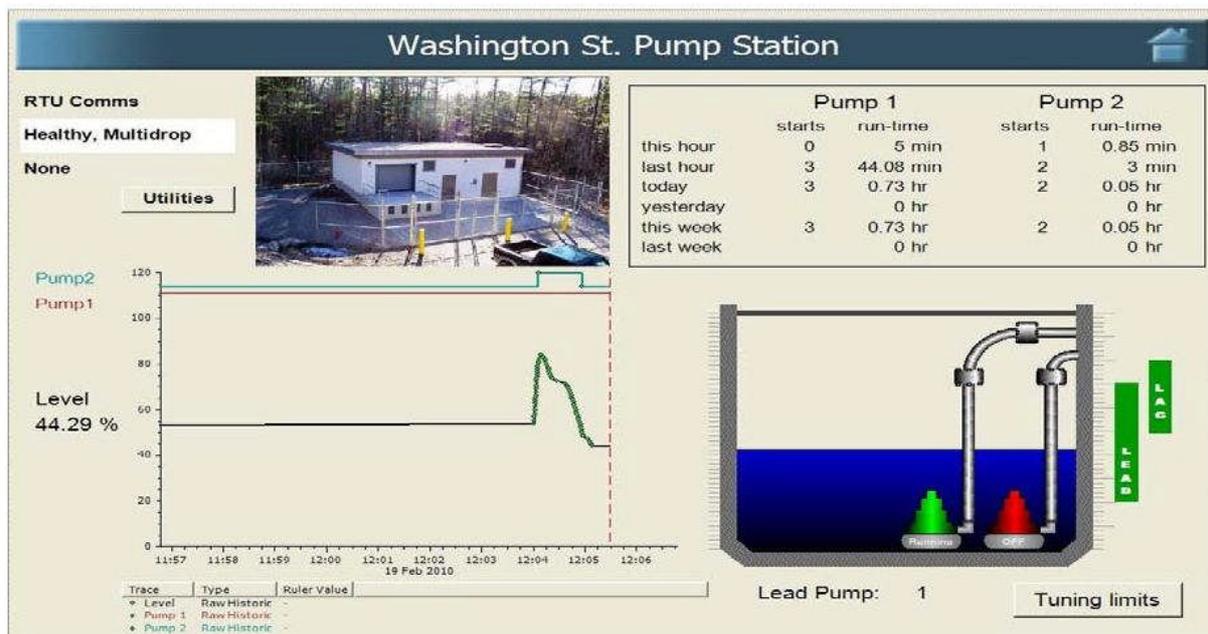
Control Microsystems has partnered with Longwatch, an industry leader in software to manage and integrate video with SCADA systems. The product combination provides a remote security solution allowing operations staff to monitor both the physical security of sites as well as the expected operation of the system.
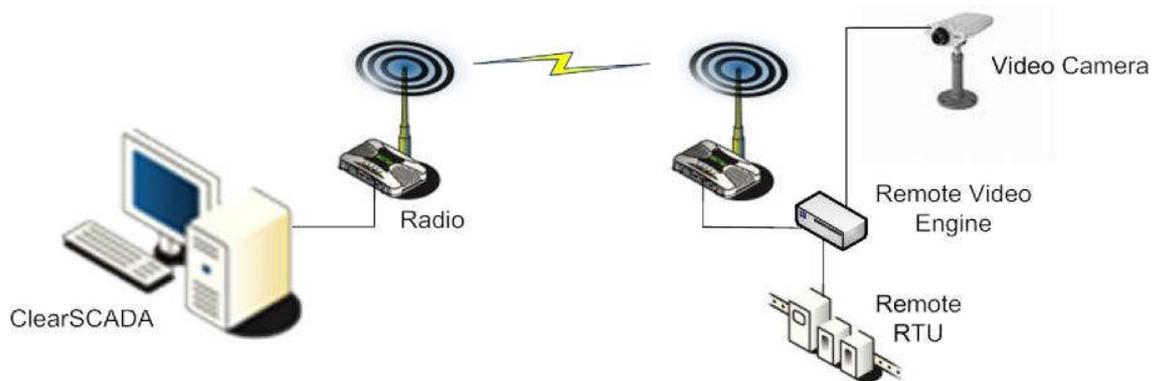
The image above shows a typical solution configured for ClearSCADA/ *Power* **RICH** *System*©**–Enterprise Edition**. The system is made with a number of key components:

- Cameras supporting pan, tilt, and zoom.
- The Longwatch video engine is at each site to manage and buffer the real-time video.
- *Power* **RICH** *System*©**–Enterprise Edition** host computer with Video Control software for video archiving and alarm management.

Field based cameras constantly record high-resolution video at the remote site and when an abnormal condition occurs an 'event clip', which is typically lower resolution to accommodate the communications network limitations, is sent back to the control centre based on predetermined triggers. The high-resolution video remains at the remote site and is stored within the remote video engine appliance. This mechanism provides buffering in case the communications to the remote site is unavailable.

Further to this, communications between the remote site and control room can utilize existing infrastructure. It is not necessary to install dedicated IP links for video as video information can be transmitted to the host computer on the same links already existing for SCADA data. Where system communications utilize slow links such as 9600-baud serial radios, video data can still be transmitted back to the central computer.

Power **RICH** *System*©**–Enterprise Edition** interfaces to the Video Control software using industry standard OPC. Therefore, points/tags can be configured to monitor for alarms, such as motion detection, used for PTZ control to move the cameras to pre-set positions, and to monitor parameters, such as communications bandwidth, video bit rates, etc. Once an alarm is detected, the operations staff can view the historical video clips and alarm information stored in the Video Control software.

This provides the ability for video information captured from the remote site to be compared to

control process information in the same period, allowing operators to see if physical issues are related to process disturbances.

Conclusion

Surveillance of remote assets using video technology provides greater visibility of real-time conditions. When these assets are related to critical infrastructure, such as drinking water, pipelines, electrical substations, etc., and where governments around the world have mandated increased monitoring, video surveillance is a natural and efficient solution. The Longwatch and ClearSCADA/ *Power* **RICH** *System*© –**Enterprise Edition** combination provides all the functionality to meet these requirements while minimizing costs and implementation time by utilizing existing SCADA networks.

About the Author, edited by Dr Jay Park

Eric Schwantler has over 20 years of experience in the SCADA industry, including 15 years dedicated to the development, promotion, and sales of SCADA management software. As the ClearSCADA Product Manager for Control Microsystems, Eric is responsible for managing the product message, key sales opportunities, and channel development.

Jay has worked in the computer and controls industry for more than 35 years. At ABB, he has been responsible for the three Power Monitor and Control, SCADA systems, marketed by ABB and the *Power* **RICH** *System* [All Windows higher than XP]) marketed by BCI Technologies. Jay has a Ph.D. in Engineering Management and is Product Manager for BCI Technologies, PRS division.

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