

SCADA Network & Data Redundancy at Guelph Water: Ensuring Security of Supply for Operations and Compliance

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OWWA Program Tracks: Automation

Short Abstract for Program (50 words)

SCADA systems are vital for both operations and regulatory compliance. Due to requirements outlined in O.Reg. 170, SCADA systems must meet very high uptime requirements, including logging data every 5 minutes. This talk provides insight into how Guelph Water added network redundancy and data-logging redundancy to its SCADA system.

Long Abstract (250 Words)

In drinking water utilities, SCADA (supervisory control and data acquisition) systems play a vital role for both operations and compliance. SCADA enables operators to remotely view, monitor, and control water facilities. For regulatory compliance, SCADA systems log critical process parameters, including meeting the 5 minute data-logging interval for chlorine residuals per O.Reg. 170.

Realizing the importance of its drinking water SCADA system, particularly the compliance risks and staffing impacts when the SCADA system is not available, Guelph Water embarked on a project in late-2016 to add redundancy to its SCADA system.

The presentation begins with a discussion of various network technologies, including why Guelph Water chose a SCADA network solution consisting of a primary dedicated fibre optic network that is backed up by a secondary encrypted wireless (cellular) backup network. The use of BGP (border gateway protocol) will be explained, as it allows a site to automatically switch to the backup network within 45 seconds of a fibre outage (and automatically return back once the fibre connection is restored).

For data-logging, Guelph Water considered a number of technologies before selecting a three level data-logging system. The pros/cons of various data-logging approaches will be covered, followed by a review of the setup that Guelph uses. Of note is the use of store/forward data-loggers that tightly integrate with historians, a backup historian, and DNP3 protocol (which has built-in store/forward data-logging) to form effective data redundancy solution.

The talk will conclude with a summary of best practices for implementing network and data-logging redundancy.

Learning Objective 1

Learn about options available to implementing redundant SCADA network connections.

Learning Objective 2

Understand the challenges involved with implementing a redundant network solution that will automatically switch to a backup network in the event of an outage.

Learning Objective 3

Learn about best practices when it comes to implementing redundant data logging technologies.

About the Authors



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