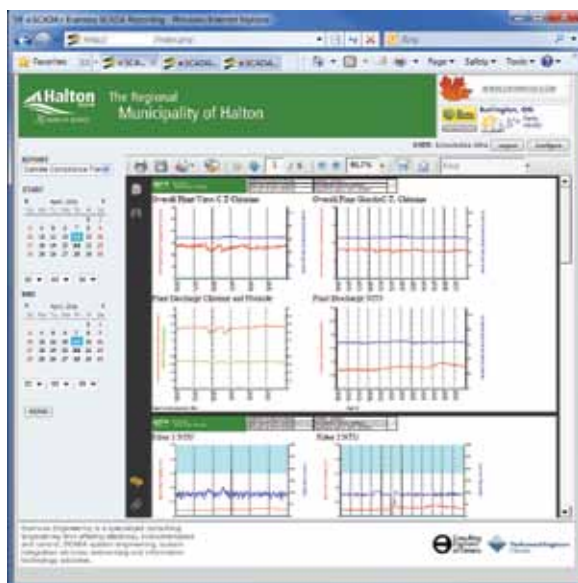# SCADA

THERE IS NO 'R' IN

By Tom DeLaura, Jason Low & Dennis Mutti

Open-source SCADA model allows for faster reporting

The e.SCADA.r open source package allows utilities to develop the exact reports they needs and frees up resources from internal SCADA teams.

ARTICLE SUMMARY

Challenge: Utilities were receiving large amounts of data from their SCADA systems and did not have the resources to maintain and synthesize it.

Solution: To analyze data more quickly with fewer resources, an open-source SCADA model was implemented.

Conclusion: The user-friendly aspects of open-source SCADA systems can streamline report generation and data management.

The monitoring and control of water utility processes is done with what the industry calls "SCADA systems." That acronym stands for "Supervisory Control and Data Acquisition." We do not see a letter, however, that describes what to do with all of that data once it has been acquired. SCADA systems provide an extension of our senses and the ability to enact control from afar, even automatically, but they do not easily help us do something useful with the huge amounts of data they so quickly can amass. Most of us fight with spreadsheets or charting tools to try and make sense of what the data should be telling us more clearly.

The "R" of reporting is not a part of the SCADA acronym, and this function continues to be a challenge for SCADA systems. Much of the data analysis is accomplished by reporting it out in some meaningful fashion. It might be a shift report, a regulatory compliance report, or a report that needed compilation in response to an ad-hoc request, usually in the haste of some emergency. Implementing effective reporting continues to be a challenge with SCADA systems.

A New Model

What we do with data once we have acquired it should help us perform our jobs better. Effective reporting and data analysis is difficult for many reasons, including wide variations in individual user requirements, lack of flexibility in reporting packages and the need for labor-intensive custom programming whenever a report needs to be created or even slightly changed.

As a radical departure from existing reporting software approaches, a new open source reporting package has gained traction in Ontario's water and wastewater sector and is now coming to the U.S. Because public water and wastewater utilities do not compete with each other, the open source business model has been a success. By emphasizing sharing and collaboration to build a reporting solution based on the needs of the user community, everyone wins. This article provides insight into this freely distributed reporting and analysis software package and how its open source nature is one of its major benefits.

Self Service

In the open source model, software is distributed free of charge to anyone who wants to use it. At this point in time, e.SCADA.r (the name of the open source package) has a number of features that are being increasingly applied at water and wastewater plants. These include ad-hoc reporting, multi-pen trend charts, daily reports for online sign-off, operational reporting, specialized reporting for regulatory purposes, alarm/event log analysis, and statistical alarms and reporting. The software also can generate reports in the form of Web pages, PDFs, printouts and Excel spreadsheets—all with the theme of providing self service so that users can get the data they need without having to depend on SCADA programing resources or IT assistance for access. Reports can be configured to be automatically printed and also can be e-mailed to individuals or groups on a scheduled basis. Users who want additional features have the option of creating them in-house or utilizing outside assistance. Thus, new reporting features can be added whenever they are needed. Once a new feature is added to the open source code, it is made available to all other users at no additional cost. Installation and configuration of the software is straightforward and can be done independently by the end user or with assistance, available along with training and ongoing support, if desired.
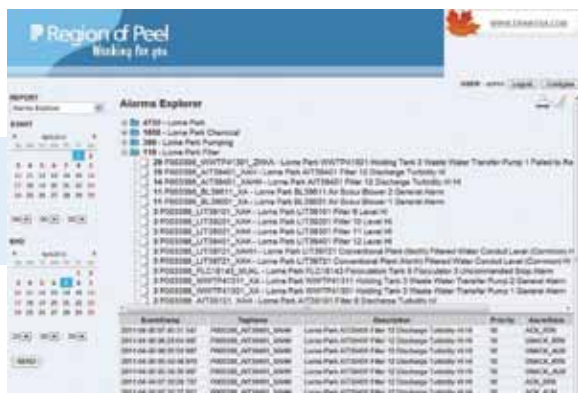
This is a key benefit to smaller utilities because they can get a full-featured reporting tool with just the cost of invested time. The software gives larger municipalities the flexibility to easily make use of and enhance the specialized features they need. The software also is unrestricted by per seat licensing, which allows utilities the flexibility to deploy it for whichever user group needs it. It has proven to be an effective tool for reducing the labor-intensive data requests with which many SCADA groups have to contend.

Its Web-based graphical interface makes the tool easy to use. Users interact with the tool using a Web browser with no custom programming required. Setting up the software generally takes about half a day; after that, it is entirely user-configurable using a Web browser. Data is retrieved from the SCADA system's existing historian server and reports are configured by users using the Web-based graphical interface.

Once a report is configured by a user, the "recipe" for creating that report is automatically stored so that it can be called up at a later point in time. Saved report recipes then can be copied and/or adjusted to make new report definitions by using the same Web-based graphical interface. Because the process data comes from the SCADA system's existing historian server, there is no need to configure or maintain a duplicate reporting database, thus maintaining a single data set and ensuring no errors occur from replicating the original data values. Reports can be targeted to individuals, groups or classes of interested parties, and created either on demand or by schedules.

Product at Work

The region of Halton, Ontario, Canada, was one of the first municipal water utilities to use the tool. The utility had a large collection of Excel spreadsheet-based reports that were difficult to use and labor-intensive to maintain, so it turned to the open software approach. The software's user-oriented, self-serve nature meant users could develop the exact reports they wanted and the region could free up resources from its internal SCADA team.

The city of Hamilton is responsible for adding alarm and event log analyzer features to the open-reporting tool.

Halton has called the tool "very valuable" in its ability to quickly configure and change reports and trends and then send those and other reports to any remote device (hand-held, tablet, smart phone, etc.). Staff now can see operating data from start to finish; therefore, it has created a pro-active approach to operations that has not only allowed faster analysis of situations, but actually prevents adverse incidents from happening.

The city of Hamilton, Ontario, Canada, is another user of the software. In this case, the city required a tool for analyzing its alarm and event logs. With multiple water and wastewater treatment plants, numerous sewage lift stations and water pumping stations—not to mention, water towers and other automated parts of its infrastructure—providing tools for analyzing alarm and event logs was critical for the city's operations and maintenance departments.

Not seeing a commercial product that met its criteria, the city worked to add this feature to the open-reporting tool, which now is used on a daily basis by the city and integrated into its HMI software. Thanks to this initiative, the alarm and event log analysis tool now is available to other water utilities as part of the package.

In addition to Halton and Hamilton, a number of other public utilities are using the open source software for reporting. The entire theme is one of collaboration and sharing. Two user group meetings allowed users to share their experiences and come up with ideas about the features and enhancements they would like added. Future user group meetings will take place twice a year.

The e.SCADA.r open source package is a software project that continues to evolve. What began three years ago as an easy-to-use Web-based reporting tool for a water util-ity in southern Ontario needed has grown into an easy-to-use customizable reporting tool in use by water and wastewater utilities across Ontario, thanks to its open source software model and a keen group of early adopters. **WWD**

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