Ten questions to ask before choosing SCADA software

When creating SCADA specifications, engineering firms must focus on meeting the immediate start-up and operational requirements of the SCADA system. This often means specifying products with which they are familiar. The engineer wants to ensure that the new system meets all start-up requirements at a reasonable price. It is often difficult to look past the immediate project and consider long range plans, cost of system maintenance, and keeping your SCADA application current with evolving technology.

It is up to you, the end user, to share these important considerations for your SCADA system during the planning process. The following questions may help you ensure that these decisions will optimize your long-term SCADA strategy.

1. **Will we be locked into one company's radios, PLCs, RTUs, and pump controllers?**

   The specified SCADA/HMI products should meet the immediate communications requirements of the current project. However, they may limit your long term choice of suppliers. Make sure your HMI includes an extensive library of standard and proprietary device drivers to maintain maximum flexibility. While OPC® and DDE® are potential options; they place another level of software between the HMI and the field device. Communications issues are less easily diagnosed and more subject to the whims of third party suppliers. If available, direct drivers are preferred.

   - Direct drivers = less problems = lower integration costs

2. **Will I need to rebuild my application every time I install a new operating system?**

   Software products will inevitably have newer versions to take advantage of evolving technologies in both hardware and software. Often these upgrades come at a huge cost, not only in terms of new software licenses but also because you may need to rebuild much of the existing application - sometimes from scratch. Make sure that your software choice has a history of supporting older versions, possibly even decades old!

3. **Will we need to upgrade our server-level computer hardware?**

   Unless the process you are monitoring is very large (over 100,000 tags), your HMI should be able to run efficiently on a standard PC rather than an expensive rack-mounted servers. Combined with server and historian redundancy, a Windows based system can provide a high level of system reliability at a fraction of the cost.

4. **Will Third Party components break each time I upgrade an operating system version?**

   While third party operational packages such as reporting and historizing are very appealing, they will pose compatibility issues when upgrading the OS. Additionally, maintaining multiple programs can become a headache. For example, synchronizing alarms between the HMI and external alarm dialer can be time consuming. Failure to duplicate entries can be catastrophic.

5. **Can I roll back in the event a configuration change has undesired results?**

   Configuration changes sometimes produce unexpected and unwanted results. This problem is exacerbated with frequent personnel changes and early retirements. Some SCADA products now contain some form of application version control that allows you to roll back or undo to a known good version of the application. To best protect your process, make sure your HMI's version control functionality can trace all changes by all users on all application development servers.

6. **How will the system back up historical data and application configuration?**

It is becoming increasingly inexpensive to add an additional desktop computer to a SCADA system. Conversely, the cost of a system going down and loss of control and data can be significant. Choose an HMI that takes full benefit of server redundancy. You will then have at least one up-to-date backup copy of your application and all your historical data. As an additional safeguard, incorporate some form of additional data backup such as an external tape drive, CD-RW, DVD-RW or external hard drive. This backup should include:

- Daily backup of differential historical data (e.g. files that have changed in the last 24 hours)
- Weekly backup of the present monthly historical databases and the application directory
- Application directory backup anytime the application changes

7. **How will the system handle automatic failover and server redundancy?**

Having established the benefits of server redundancy, make sure your HMI application automatically handles primary to backup server failover, ensuring seamless connection transfers for both thick clients and Internet clients. When servers are restored, data and I/O communications should automatically resynchronize. This may require the purchase of additional HMI/SCADA software licenses for your redundant servers. This ensures that:

- The safe monitoring & control of your system continues uninterrupted
- Staff continue to be notified about alarms
- Historical data are collected without interruption
- Historical data are backed up
- Application data are backed up

Note: It is highly recommended that redundant servers be located at separate locations from the primary servers in case one location is destroyed or becomes inaccessible.

8. **What options will I have to access the system remotely?**

A typical example of technology evolution is the growing presence of hand held devices in the operations world. Ideally, access to an application via mobile devices should be done by using tools embedded in the HMI. This will maintain security within the application and take advantage of features such encrypted access through the use of Secure Socket Layer (SSL) certificates. A program that supports secure VPN tunnels is even better!

9. **Will we be able to monitor the health of our computers and networks?**

To ensure that your PCs continue to provide reliable service, make sure that your HMI is able to monitor such resources as remaining hard drive capacity, memory utilization, and CPU usage. When these resources run low, will you be notified? Networked applications are dependent upon the IP connections between their HMI servers and clients. Choose software that allows you to easily monitor these connections by creating 'Network Status' tags that can be drawn on any application display. Configure alarms within the tags to notify you of broken connections.

10. **How will the application be secured?**

It is very easy for busy operators to sidestep security best practices in favor of convenience. Applications remain logged on indefinitely, or use passwords like 1234. Often a single password is used for an entire application.

Make sure that your software choice allows you to:

- Provide users with their own passwords with privileges specific to their responsibilities
- Log off when inactive for more than a few minutes
- Employ passwords that include numbers and both upper and lower case letters

Note: To remain effective, passwords should be changed periodically.