The Business Case
For
Proactive Monitoring and Administration
Of
SCADA System Infrastructures

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Traditionally, operating companies have maintained an in-house group of people dedicated to the on-going support of their SCADA systems. These people knew the company's operations and had the time to learn the particular SCADA system(s) in use. Their operations and technical knowledge provided solid support to keep these mission critical systems going. As companies down-sized, the in-house support staff was repeatedly trimmed to the point that now many SCADA system users have only one or two people with the responsibility to maintain their SCADA system(s). This is a daunting task given the size, complexity, frequent changes, number of external interfaces, and shorter life spans of today's SCADA systems. Yesterday's SCADA system support group had to keep relatively static systems going. Today's SCADA system manager has to keep very dynamic systems going while ensuring adequate planning for needed upgrades and replacements.

How can a SCADA system manager hope to do this with little or no technical support staff? Several options are available, including one or more of the following:

- Dedicated In-House SCADA support,
- Corporate In-House IT,
- SCADA vendor,
- Individual contractor,
- Company providing contract support, or
- Out-Source SCADA support.

Let us examine the strengths and weaknesses of each of these. Please refer to Table 1.

A dedicated in-house SCADA support group provides the best response time to problems. They are already on-site and ready to go. Their quality of service is excellent because they know the systems so well. Cost is the main weakness of the

dedicated in-house SCADA support group. This is the main reason so few exist today. Their service is good at reliably and consistently solving problems. Hidden risks for this type of support include technical obsolescence because the group spends years supporting increasingly out-of-date systems. When the time arrives to acquire and support new systems, the in-house SCADA support group often lacks the skills necessary. The dedicated in-house SCADA support group is good at working proactively to prevent crises because they know the systems well and monitor the operation daily. It can also be very difficult to recruit qualified people for this type of position.

The corporate in-house IT group is less responsive than a dedicated SCADA support group but still a viable option. Their quality is also a bit less than a dedicated group, but still generally acceptable. Their cost, although less than a dedicated group, is still prohibitive for most companies. It just requires too much time and money to keep enough IT people adequately trained on the SCADA systems. The IT group's consistency and reliability suffer because they cannot stay as in-touch with the system as is necessary to maintain quality and consistency. Hidden risks are similar to the dedicated in-house SCADA support group. They are much less likely to be proactive because, by the very nature of the service they provide to the corporation, they are called in to solve specific problems as they occur.

The SCADA system vendor is often viewed as the best source for SCADA system support because of their in-depth knowledge of the SCADA product. However, in practice, this knowledge does not make up for other weaknesses in providing service. The SCADA system vendor's response time is usually very poor. Their staff is already assigned to projects with looming deadlines and milestones. SCADA system users often must endure lengthy waits until someone is available. The quality of service provided by the SCADA system vendor is often lacking due to a harried effort to solve the problem so the person working on it can get back to their other assignments. The assigned person often knows little about the specific systems. The rates charged for support work by the SCADA system vendor make it an expensive alternative, and consistency and reliability of service are very low because it is outside their normal work flow. They break someone free when they can and tell them to "just fix it." This is not conducive to consistent or reliable results. The SCADA system vendor has significant hidden risks due to the small number of people familiar with older versions of its products. Supporting older systems is such a small part of its business that it is difficult to keep people knowledgeable about systems in the field. The SCADA system vendor also rates low in being proactive. They typically have no on-going exposure to the systems in the field and thus can do little to prevent problems.

The response time of a contractor, either individual or company, is usually just acceptable. Their quality of service can be good because they have a long-term relationship with the SCADA system user. They tend to be expensive because they need to spend considerable time and energy to get up to speed on the particular systems and problems. Their consistency and reliability are also often just acceptable because the range of expertise and discipline in following procedures varies

considerably. The hidden risks are great because all the expertise resides in particular individuals, while no generally available store of information about the specific systems is maintained. Since they are just called in to fight fires, that is all they tend to do. Little or no effort is made at being proactive.

Out-sourcing the SCADA system support can provide excellent response time. Support is one of their core business activities and they are prepared to provide prompt service. Out-sourcing requires a long-term commitment by both parties. Because of this long-term commitment, the company providing the SCADA system support has a vested interest in acquiring and maintaining a high degree of expertise, as well as an extensive database of information about the specific systems under contract. The database is instrumental in providing quality service because the support staff has detailed information readily available about the systems in question. Lower cost is also one of the advantages of out-sourcing. Many users share the time and expense of maintaining a technically competent support staff. The database containing system information, in conjunction with proactive monitoring tools, allows very cost-effective support. To provide efficient and effective support, the out-sourcing support company has detailed procedures to ensure consistent and reliable service. As better methods are developed, they are incorporated into the revised procedures so the entire support staff will benefit. The hidden risks of out-sourcing SCADA system support are lower because the company providing the service maintains the high degree of expertise and extensive database of information about the systems so it is less dependent on any specific individual.

One of the biggest strengths of out-sourcing SCADA system support is the proactive nature of this support. This is a function of system monitoring tools, which are beginning to appear. These tools provide detailed information about the health and robustness of the target SCADA systems. Long-term trends can be observed and dealt with. Statistical methods allow early detection of potential crises. Because the tools are automated, the cost remains reasonable.

Out-sourced SCADA support is not without its risks. First, the concept of formalized support for SCADA systems is new, and few vendors offer a service that is backed up with documented and repeatable processes and procedures. Next, no out-sourced service can maintain the awareness of daily operational issues and details that is possible with an on-site, in-house team. Finally, the out-sourced solution is at risk if all customers have problems at the same time. This situation can occur during large-scale natural disasters, such as hurricanes and earthquakes. It is prudent to understand these risks and know the plans and procedures that have been put in place by the out-source support vendor to deal with such situations.

Table 1
Comparison of Different Types of SCADA Support Service

Service Types / Support Values	In-House		SCADA Vendor	Contractor		Out-Sourced
	Dedicated	IT Group		Individual	Company	
Response Time	High	Medium	Low	Medium	Medium	High
Quality	High	Medium	Low	Medium	Medium	High
Affordability	Low	Low	Low	Medium	Medium	High
Repeatable/ Predictable	High	Medium	Low	Medium	Medium	High
Hidden Risks	High	Medium	Medium	High	Medium	Medium
Proactive	High	Medium	Low	Low	Medium	High

Definition of Terms:

Response Time: The time it takes to start resolving the problem once the problem has been reported.

Quality: The problem will be fixed correctly with no adverse impact on other areas.

Affordability: The total cost of retaining the type of service.

Repeatable/Predictable: Consistent and reliable approach to solving and preventing problems.

Hidden Risks: Unexpected problems and difficulties in getting support.

Proactive: Actively monitoring for potential problem areas so they can be prevented or their impact minimized.

SCADA system support out-sourcing may offer an alternative to traditional methods of support. One might be surprised to learn about some of the tools and techniques used to make these services effective and economically viable. Operating companies may decide to “test the water” by using a support service to augment its existing support staff, or as a backup to its support staff. Finally, since the market for this type of service is relatively new, the opportunity exists to influence the products and services now entering the market place.