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**ENTELEC 2000  
SCADA Outsourcing – A Business Case  
Abstract**

By Gerald E. Snow  
UTSI International Corporation

The community of SCADA users is showing significant interest in the concept of SCADA Outsourcing. The supplier owns the control room hardware and software, and provides these products along with services, maintenance, and 24 hr x 7 day support to the user, for a monthly service fee. Companies today outsource such functions as IT, their communications carrier, LAN management and consulting, as well as business functions such as employment searches, legal services, accounting, payroll, etc. Outsourcing provides the operating company direct access to, and dependable service from, focused, technical and knowledgeable talent for this very critical segment of their operation. This enables the client to focus on their core business, such as the transportation of gas or liquids via pipeline, or the distribution of electricity.

Outsourcing shifts the costs involved with updating and maintaining a SCADA system from a capital expenditure to monthly operating expenses. This can have significant financial advantages to the client company. Additionally, it is difficult to recruit, train, and retain personnel with specific in-depth knowledge of the internal workings of a particular SCADA system. Perhaps the most compelling feature of SCADA Outsourcing is the mitigating of risk. The client will not have to be concerned with the cost and effort involved in upgrades, system maintenance and downtime, personnel issues, etc. This paper focuses on these issues, and develops a business case for operating companies to consider in determining if outsourcing their SCADA system makes technical and financial sense.

# **ENTELEC 2000 SCADA Outsourcing – A Business Case**

By Gerald E. Snow  
UTSI International Corporation

## **Introduction**

The community of SCADA users is showing significant interest in the concept of SCADA Outsourcing. Under an outsourcing arrangement, the outsourcing firm owns the control room hardware and software licenses and provides these products along with services, maintenance, and 24 hr x 7 day x 52 week per year support to the user, for a monthly service fee. Outsourcing is not a lease or a financing method. It is a service which offloads ownership responsibility to an experienced third party for a monthly fee. SCADA and ancillary product licensing are transferred to the custody of the outsourcing firm. The outsourcing firm maintains and upgrades the system, pays ongoing upgrade and support fees, hardware maintenance, third-party vendor fees, insurance, and any other related costs during the term of the agreement. Upon completion of the term, the system may be transferred back to the client by mutually agreed upon terms, or the agreement may be renewed for another term.

Companies today outsource such functions as their communications carrier, corporate IT services, as well as business functions such as employment searches, legal services, accounting, 401K investment services, payroll, etc. Outsourcing provides the operating company direct access to and dependable service from focused, technical and knowledgeable talent for very critical segments of its operation. This enables the client to focus on their core business, such as the transportation of gas or liquids via pipeline, or the distribution of electricity, and to avoid the headaches of administration of ancillary functions. Consider the fact that the vast majority of operating companies outsource their communications carrier. It is absurd to think of a gas pipeline launching a satellite to carry their communications. Companies outsource these necessary functions to capable and dependable third parties who specialize in them as a cost effective and reliable service. Benefits include lower total operating costs, the addition of expertise and experience, reduced risk, and the ability to focus on core business, not ancillary support structure requirements.

## **Technical Considerations**

Outsourcing can benefit the operating company in many ways, including decreased system downtime, smoother operations with more efficient and reliable systems, and proactive systems maintenance. The tangible product of the outsourcing firm is SCADA functionality, which includes data acquisition, control capabilities, historical archive, as well as interfaces to GUIs, IT systems, and third-party products. This outsourcing

service can be extended to include other functions, as mutually agreed upon by the parties.

Reliable service is paramount to success in this venture. As the SCADA server and interface system are now the responsibility of, and in fact owned by, the outsourcing firm, 24 hour x 7 day x 52 week per year support of these functions is mandated. The client must continue to receive a dependable stream of data and control capabilities. The outsourcing firm is required to maintain the server and ancillary systems that supply this connectivity.

During the term of the agreement, the operating company should expect the outsourcing firm to provide the following:

- Hardware support, maintenance, and upgrade path,
- Software support, maintenance, and upgrade path (including SCADA software, OS, and layered products),
- Third-party interface support,
- Vendor support and maintenance (paid by the outsourcing firm),
- Insurance, and
- Services as agreed upon by the parties.

It is completely incumbent upon the outsourcing firm to maintain a stable system. For that reason, the outsourcing firm will play a key role in determining when, or if, upgrades and enhancements are required. Having said that, it is important to keep the system as current as is practically possible. A system that is too many revisions removed from the current SCADA vendor release is difficult to support. Conversely, it is impractical to apply every software release without reason. Both parties must agree on a reasonable and sound upgrade policy.

The SCADA systems, as well as backup systems and historical archives, can be located anywhere acceptable to the parties. Present communications technologies permit a wide variety of solutions which benefit both the client and the outsourcing firm. Contracting for the outsourcing firm to provide facilities to host the system has additional benefits to the client. It is prudent to require the outsourcing firm to provide system hosting which provides the following:

- Secure physical access to the systems,
- Secure remote access to the systems, both user and supervisory levels,
- Multi-carrier communications access (wired and fiber, satellite, microwave, etc.),
- Weather “tolerant” facilities with backup power, telecommunications, and other functions, and
- Remote backup systems geographically removed from the primary.

Even if the client prefers to have the primary system in its local facility, it is prudent to consider locating the backup system in the outsourcing firm facility. Easy access to the

physical systems (or at least to the backup system) for maintenance is of significant benefit to the outsourcing firm and to the client.

An outsourcing program can bring personnel with the latest experience to work on the client application. It is very difficult to recruit, train, motivate, and retain in-house SCADA experts. Outsourcing provides this expertise on a 24 hr x 7 day x 52 week per year basis. This would be expensive for the client to maintain, and difficult to motivate and retain. External resources can bring fresh ideas, experience from other applications, and add value to the client implementation. After commissioning, the ongoing maintenance requires a different expertise from the outsourcing firm. Outsourcing firms can apply engineers with a wide variety of expertise and experience to the various tasks required on the client system. Different skill sets can be applied to consulting, implementing, troubleshooting, interface and systems programming, graphics development, database management, etc. These skill sets are available when needed, and the client is not burdened with the cost of these resources when they are not required. With governmental regulations becoming more stringent in environmental and human safety concerns, it is prudent to permit industry recognized experts to maintain these mission critical SCADA systems. Outsourcing firms are a great source of objective consulting. They can advise the client on the best technology available for the application. Additionally, the not-invented-here development problem is not a factor because the entire system is outsourced. Interdepartmental friction is reduced, and the outsourcing firm becomes an asset of the company management.

## **Financial Considerations**

Outsourcing shifts the costs involved with updating and maintaining a SCADA system from a capital expenditure to monthly operating expenses. This can have significant financial advantages to the client company. Service fees are often more attractive than capital outlays. These fees are fixed costs which can be budgeted, versus the varied costs associated with a client owned and maintained system. This reduced financial risk is a very attractive attribute of outsourcing. There are significant (and varied) costs associated with a SCADA system, such as the following costs:

- Equipment,
- Software,
- Personnel, and
- Training.

Implementation costs include:

- Consulting,
- Contracting and purchasing,
- Installation and commissioning,

- Upgrading, and
- Migration to future SCADA platforms.

Often times, the costs associated with consulting, purchasing, implementing and commissioning, or upgrading of a SCADA system are rolled into the outsourcing agreement. This provides a long-term distribution of costs, which can be significant. Additionally, vendor license support fees, hardware support, insurance, and other fees are generally included in an outsourcing agreement. Since the SCADA systems and historical archives can be located anywhere acceptable to the parties, the outsourcing firm can contract for “high reliability” facilities, communications links, and personnel in a cost effective manner. It is worth considering the financial advantages of contracting this aspect of the operation as well.

I have noticed that sometimes circumstances arise which require that both parties revisit the terms of the agreement. Pipelines may be added, or split from, the operating company system, company management changes, or other unforeseen events occur. A good outsourcing agreement provides for such eventualities so that the parties can modify the agreement to their mutual satisfaction.

Finally, maintaining a SCADA system is not the primary business of a transmission or distribution entity, rather a necessary and expensive overhead. Outsourcing allows the client to focus on their core business, such as the transportation of gas or liquids via pipeline, or the distribution of electricity. The above argument makes a valid case for outsourcing. However, financial analysis is only a part of the business case.

## **Practical Considerations**

Outsourcing is an appropriate solution in a variety of situations. One of the most opportune times is when the client is considering hardware or software upgrades. Consider outsourcing as an alternative when adding new SCADA systems, or changing SCADA system vendors, or perhaps when the client is adding responsibility for a new pipeline, or splitting off a pipeline to another operating company. However, a major hardware or software change is not necessary to consider outsourcing. The client may transfer ownership responsibility to the outsourcing firm at any time. The client would transfer ownership of current assets (software licenses, hardware systems, etc.) to the outsourcing firm only for the period of the agreement. The outsourcing firm is responsible for keeping the system up-to-date, making necessary improvements and enhancements, and then transferring ownership responsibility back to the client at the end of the term.

Staffing issues often act as a catalyst for the operating company to consider outsourcing. People with in-depth knowledge necessary to the SCADA operation may be promoted or transferred within the company, or possibly leave the company over a period of time. This creates a void that is difficult to fill. Outsourcing firms supply staffing to support the application, and the client is shielded from this issue.

Outsourcing solutions can help bridge the gap between application specific real-time control systems, and corporate IT networks. Working closely with the operating company, the outsourcing firm can help meet the growing need to supply specific information to individuals in the corporation. The outsourcing firm should play an active role in system management and corporate integration throughout the term of the agreement.

Today's high performance SCADA systems provide the features, processing power, and security necessary to serve the needs of multiple smaller outsourced clients. This enables the extensive cost of a redundant state-of-the-art system to be shared among several clients who may not be able to afford a system individually. The clients can share the costs of the communications overhead, enabling them to be used as efficiently and economically as possible. Independent clients can be assured of secure data and dependable control functions. They can also have the benefits of an experienced outsourcing firm staff, for a monthly fee that fits within their budget. The outsourcing firm can provide a wide range of services to the client, such as database management, graphics development, report generation, etc. Vendors can negotiate the communications interface, provide help desk services, and supply a host of other services to enable the client to operate an efficient and powerful SCADA system.

Perhaps the most compelling feature of SCADA Outsourcing is mitigating risk. The client will not have to be concerned with the cost and effort involved in upgrades, system maintenance and downtime, personnel issues, etc.

### **Additional Considerations**

In considering the validity of outsourcing, an operating company must justify this approach versus conventional implementation. Some immediate objections come to mind, and are listed below:

- 1) We already have in-house staff.

Outsourcing would free them to apply their skill sets to other areas of the organization. This avoids burnout that too often leads to good employees leaving. It would also free them to advance within the company.

- 2) It is too costly.

Outsourcing is one of the least costly alternatives of hosting a SCADA system. This is especially true when one considers the following cost of:

- Maintaining multi-disciplined expertise,
- Upgrading and maintaining the system and related infrastructure,
- Retaining independent analysis and consulting services,

- Staffing for 24 hr x 7 day x 52 week coverage,
- Providing training and seminars necessary to keep viable SCADA skills, and
- Funding the increasing costs of personnel (salary, benefits, etc.).

In the present tight labor market, it is difficult for most companies to acquire and retain talented employees. At UTSI International Corporation, labor costs have increased significantly in a single year (1998 to 1999). Combine this with the open-ended costs of licenses, maintenance fees, upgrades to the software and hardware, and it is apparent that the costs of a quality SCADA system are significant. Therefore, it makes good fiscal and practical sense to outsource this service to a qualified vendor.

## **Conclusion**

In considering the validity of outsourcing, an operating company must justify this approach versus conventional implementation and management. It must make sense, both financially and strategically. Exchanging a variable, difficult to forecast, capital expenditure, for a fixed cost monthly service is certainly attractive in its own right. The addition of a broad range of experienced personnel, a reliable and state-of-the-art SCADA system, and reduced risk make outsourcing an option well worth considering.