DESIGN/BID/BUILD PROJECT DELIVERY METHOD

This implementation method consists of three distinct project phases; the design phase, the bid phase and the build phase. This method of project delivery is most common in utility and other public sector projects. The owner will typically be dealing with at least two persons or companies to deliver their completed SCADA system, but sometimes many more than two. There will always be an engineer or other design professional involved. Depending on if the owner decides to direct purchase the necessary equipment or let the contractor be responsible for equipment purchases as part of the contract, there can be either one or more additional entities that the owner will need to engage.

The design-bid-build method requires a set of plans and specifications to be created by an engineer or other design professional. Traditionally, these plans and specifications contain every detail of the proposed project, including the kind of SCADA Master, exact communications network specifications, general types of RTUs, PLCs, power supplies, which equipment sensors and controls will be installed and even *where* the sensors will be installed on the specific piece of equipment. This means that the designer needs to finalize every detail of the project before the project is put out for bids. After these detailed plans and specifications are completed, the owner chooses one of two routes: either purchasing all the equipment directly, then receiving multiple, qualified bids for installation (Figure 2.6.1-A), or more simply (and typically) receives bids from multiple, qualified contractors that include the equipment and the installation (Figure 2.6.1-B). Once the project is complete the owner must pay the contractor the bid amount, plus or minus the net amount of contract change orders. After the owner signs a contract for a bid-build project, they have minimal input in the remaining part of the project, unless there are any unforeseen obstacles or problems. These often result in "change orders", which tend to be costly and all parties try to avoid. Changes to the system can be made after project completion, but usually at a higher cost.

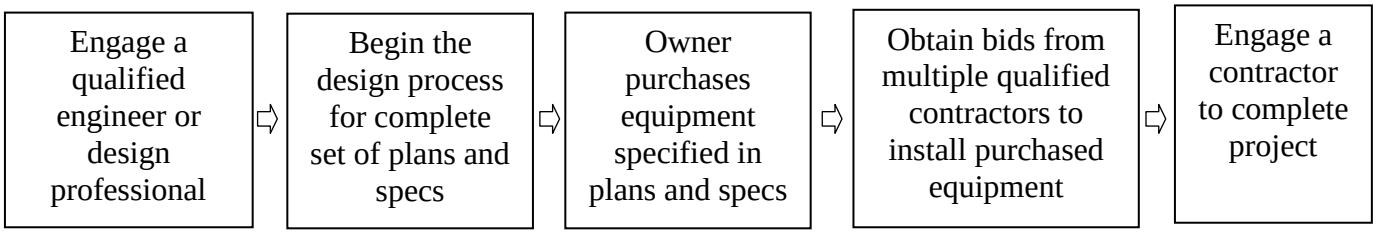

Figure 2.6.1-A – Design-Bid-Build, Owner Equipment Purchase

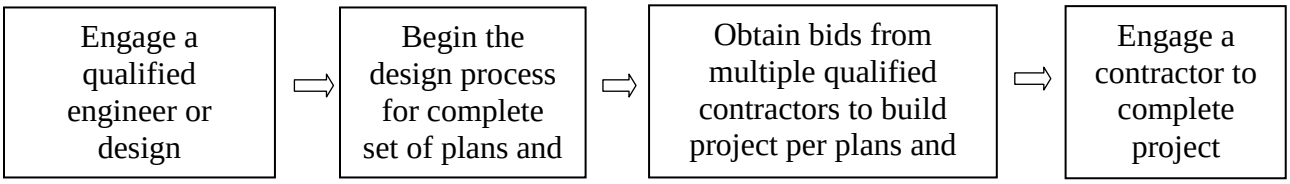

Figure 2.6.1-B – Design-Bid-Build, Typical

A small twist on the design-bid-build project delivery method is something known as issuing a "performance specification" (Figure 2.6.1-C). This method accomplishes the same end goal but in this case the engineer simply issues a ultimate project goal to be met. The engineer can even require certain equipment, but no detailed plans or specifications are produced in this process, thus transferring much of the project risk to the prospective contractor to deliver the required final product. Performance specification projects, though convenient for the design professional, often produce higher bids because the contractor understands the risk of project success has been transferred to them as the contractor and away from the design professional. It is much less probable to realize any change orders in a performance spec type of design-bid-build project, unless the conditions change or the owner initiates the change.

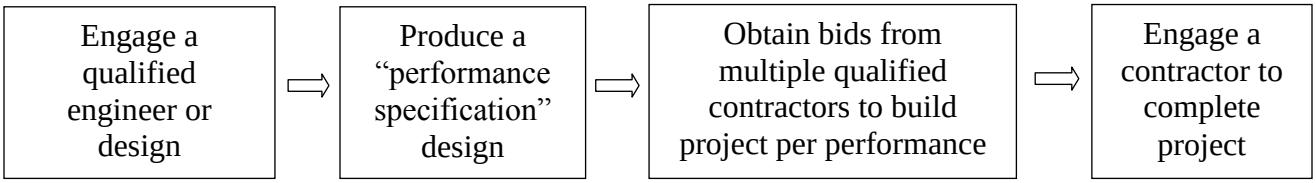

Figure 2.6.1-C – Design-Bid-Build, Performance Specification

Considerations for Potential Equipment Suppliers, Engineers and Contractors

Very often, the utility will have an existing relationship with an engineering or design consultant. This person/company may actually have the in-house talent necessary to design the entire SCADA system to meet needs. If they do not have the necessary talent in-house, then they probably have a relationship with a fellow consultant/company that has the necessary skill sets and capacity.

Designing a practical and reliable SCADA system requires a great deal of expertise and time. There is physical installation, power supplies, communications network, network connections, and then the even more difficult phases of configuration and data basing. It can be a daunting task, especially for most engineers that do not necessarily specialize in these projects. It is very important that the design professional you select has the depth of expertise necessary for the job.

Below are several items that should be considered in selecting a specific engineer or design professional:

- **Quality Standard Certifications:** Many engineers, design professionals, and equipment manufacturers adhere to procedures certified by industry standards organizations, such as ISO 9000 or the telecommunications-specific TL 9000 standard.
- **Experience and Client Testimonials:** As with any business-to-business professional service, you should check carefully for your engineer's or design professional's reputation. Find out how long they or their company has been in business, see if it can offer testimonials from its clients-and check with their clients to get a real sense of how they rate the company's services.
- **Vendor Partnerships:** Depending on your situation, pre-existing vendor partnerships may or may not be of concern to you. However, be aware of any existing partnerships so you can be aware that you may be "driven" to a certain platform or product line. Just because you are outsourcing the project design, you should still retain control. Check

what vendors the engineer prefers or works with. You should be still able to specify the vendor and equipment you want.

- **Compare Prices, But Don't Be Cheap:** The costs of using an engineer or design professional is usually justified by the quality of the plans and specifications. The quality of the plans and specs is measured by the number of change orders and if the final SCADA system performs as intended. Look for the best value, but always keep quality high on your list.

If you elect to pursue the SCADA project using the EFI delivery method, many of these same criteria can be used, but keep in mind that although EFIs will have a broad knowledge base, they will very likely maintain only a few vendor partnerships and those partnership will be where much of their expertise is focused. Below are some additional values that an EFI will bring to the SCADA project.

- **Product Knowledge:** You may already know quite a bit about the equipment you use, but you have not had the time to research everything about it. And when you are adding new types of equipment to your system, you can never be quite sure how your old and new equipment will work together. You can turn to old equipment vendors for assistance, but while they can tell you a lot about their own equipment, they likely will not know how their older equipment may interact with equipment from other manufacturers. EFIs usually have broad knowledge of different types of equipment used throughout the industry, and they have deep experience of integrating different equipment during installation. That experience and expertise is difficult to reproduce or obtain elsewhere.
- **Outsourcing Time and Trouble:** You may have been given the responsibility for a system deployment, but that does not mean you have the time, the resources, or the staff to oversee every detail of the project-especially if managing the deployment is an extra job that has been added to your everyday duties. If this is your situation, you may have a classic business case where outsourcing the work will get the job done faster, more efficiently, and even less expensively than trying to do the work entirely in-house or with a traditional design-bid-build method.
- **Project Management:** Deployments often take longer than planned, especially if you are working with new equipment. There is a lot to learn to execute a successful implementation, and it is easy to make beginner's mistakes that can extend time and budget. The project management experience of an EFI provider can be of real value here. These are companies with years of experience overseeing telemetry deployments, and they have highly developed systems for ensuring projects are completed on schedule and as planned.

Does this added value justify using an EFI provider for your project? Ask these questions:

1. Does the deployment project require extra training for your installation technicians?
2. Do you have the time to manage the entire project yourself?
3. Do you have the experience to anticipate and prevent problems and delays with your implementation?

4. If an EFI project delivery cannot meet your schedule or quality requirements, cheaper and faster is not necessarily better.
5. Do you have an established data management plan, or does this need to be part of the overall project?
6. Do you have ability to analyze the data acquired by the SCADA system?
7. Do you have a plan or the ability to use the new data in an intelligent manner in order to perform advanced planning and management in your system?

Operator Acceptance

Operator involvement and acceptance is extremely important. Operations staff can be involved from the beginning of the development phase. Operators are more likely to accept technology if they feel the final system is reflective of their suggestions and responsive to their needs.