

Contractor's Licenses and SCADA Projects

White Paper

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Introduction

In the course of most SCADA projects the question of contractor's licenses required for the participants in the construction phase of the project must be addressed. This white paper describes the organizations that are usually involved in the construction phase of a typical supervisory control and data acquisition (SCADA) system project and the teams that bid/propose on these projects.

Definitions

The following definitions have been specifically tailored for SCADA system projects.

Bidder/Proposer

An organization submitting a bid or proposal on a project. Usually a "bid" process refers to selection based on price, versus a "proposal" process where selection may be based on factors other than price, although price may also be a consideration.

Prime Contractor

The successful bidder/proposer on a project that will enter into a contract with the client/owner, provide bid bonds, performance bonds, issue certificate of warranty, and be contractually responsible for the entire project.

Subcontractor

An organization that enters into a contract with the Prime Contractor to provide certain services on the project.

Integration

The implementation of the functional specification prepared by the engineer to create a complete and working system. The engineer specifies system performance

Within this paper, there are specific references to SCADA systems on water distribution systems; however, the discussion is generally applicable to other SCADA systems.

requirements and provides guidance regarding selection of equipment, material, and software while the integrator selects the specific equipment to be used on the project and creates the actual system based on these criteria.

Integrator

An organization specializing in the integration of SCADA systems. The integrator usually purchases all of the major SCADA system components, including master station equipment (computer, monitors, printers, network equipment, etc.), remote terminal units (RTUs), software, etc. Typically, the integrator will also fabricate the RTUs if they are not “off-the-shelf” components and will perform all required programming. Finally, the integrator will usually be responsible for all system testing, preparation and submission of detailed submittals including operation and maintenance (O&M) manuals, and training of the client. Usually, the integrator will install the master station equipment, and will provide the RTUs, antennas, and associated components for installation by others.

Installation Contractor

An organization specializing in the installation of the field components associated with a SCADA system, that is, instruments, raceway systems (conduit, wire, boxes, etc.), incidental electrical (lighting, receptacles, etc.) grounding system, antenna masts/towers and in most cases the integrator-furnished antennas (and associated components) and remote terminal units (RTUs). The installation contractor will typically purchase the equipment that it will install, with the exception of the RTUs and antennas (and associated components).

Factory Acceptance Test (FAT)

A series of tests performed in the integrator’s facility prior to shipment of equipment to the field to substantiate that the system performs in accordance with the specifications.

Site Acceptance Test (SAT)

A series of tests performed in the field before the system is turned over to the client/owner to substantiate that the system performs in accordance with the specifications.

Availability Testing

A test to determine the availability of the system over a period of time after it has been turned over to the client/owner. Availability is the ratio of uptime to uptime plus downtime.

Implementation

The prime contractor (successful bidder/proposer) for this type of project is typically one of the following:

1. A system integrator, where the system integrator performs all aspects of the project (integration of the system as well as field installation).
2. A system integrator, where the system integrator performs the integration of the system, and subcontracts the field installation work to an installation contractor (the installation contractor is a subcontractor to the integrator).
3. An installation contractor, where the installation contractor performs the field installation work, and subcontracts the integration of the system to an integrator (the integrator is a subcontractor to the installation contractor).
4. A legal joint venture between an integrator and installation contractor, where the system integrator performs the integration of the system and the installation contractor performs the field installation work.

The structure of the team is often dependent on the licensing requirements of the state or locality in which the project is bid. Most integrators prefer to be the bidder/proposer and prime contractor on the project, but states often require the bidder/proposer and prime contractor to hold state-specific contractor's license(s). Not all integrators hold these licenses. In these cases, time permitting, the integrator may obtain the necessary licenses. Otherwise, an integrator will usually team with (be a subcontractor to) an installation contractor that already holds the necessary license(s). Unless there is an existing relationship with an installation contractor in the area, or one that holds the necessary license(s) for that area, integrators usually team with an electrical contractor in the area that has controls, instrumentation, and communications experience, and preferably one that has past work experience with the client.

Some states require that the prime contractor hold certain contractor’s license(s) regardless of the amount of work on the project for which the license is required. Other states consider it sufficient for the prime contractor to hire subcontractors that hold the necessary licenses for the licensed work on the project, particularly since many states consider the installation of equipment associated with a SCADA master station as “equipment procurement”, for which no licenses are required, rather than “construction” (as the master station equipment simply “plugs” together).

On a water distribution SCADA system, the “licensed” work is typically limited to the following: Installation of the field components associated with a SCADA system, that is, instruments, raceway systems (conduit, wire, boxes, etc.), grounding system, antenna masts/towers and antennas, and remote terminal units (RTUs). For instrumentation work involving piping, a mechanical or plumbing license may be required. For tower foundation and other civil work, a general contractor's license may be required. Otherwise, an electrical contractor’s license is usually all that is required for the remainder of the work (and may in fact cover the instrumentation and associated piping work as “incidental work”).

For those states in which the determination is based on the amount (construction cost) of “licensed” work on the project, the following information regarding the percentage of work on a “typical” water distribution project may be helpful. It should be noted, however, that the actual percentages might vary from project to project.

Field Installation Work (Electrical)	7%
Field Installation Work (Mechanical/Plumbing)	1%
Field Installation Work (Civil/General)	2%
“Licensed” Work Subtotal	10%
Integration / SCADA Equipment (Including Instruments)	90%
Total	100%

Licensing rules vary from state to state and are subject to change without notice. As such, a specific determination should be obtained for each and every project well ahead of the procurement phase of the project.

For more information on this or related SCADA engineering topics, please feel free to contact Timberline Engineering, Inc. as noted below:

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