Controlling Plant Electric Costs

By Doug Post

Design-build is a project delivery method focused on meeting the clients' project needs. An integrated design-build approach ties these disciplines together, focusing on optimizing your overall project.

The goal is to align in-house engineering, construction, instrumentation and automation services with your business success, and control your plant's electrical construction costs. A summary of a typical processing plant is described in the chart on page 41.

Consider implementing the following design-build principles in the areas of highest impact.

Principle #1: Time and dollar impact of schedule. A project should never start without knowing the value of a lost day of productivity. Knowing this, the design-build team can synchronize their services to appropriately shorten project schedules and minimize construction-staffing peaks.

Principle #2: Constructible design. In-house construction and engineering means front-end project planning and design is influenced by a broader experience base. Field construction professionals ensure the design considers ease of installation. The construction plan can be developed before crews are on-site and changes get expensive.

Principle #3: Wiring methods

The right design-build team can quickly assess the cost, timing, performance and flexibility associated with various wiring methods, such as conduit, cable tray, underground methods, bus duct, etc.

Principle #4: Electric room and transformers. Electric rooms are optimally located, sized and arranged to ensure space for expansion and installation speed. Motor lead lengths are minimized to control costs and ensure good starting performance.

Principle #5: Performance-based plant or company standards. Nothing stifles innovation in design-build more than entrenched, detailed standards. It's better to have the design-build team develop standards and specifications that are performance-based, brief and flexible.

Principle #6: Increased construction productivity. Prefabricating portions of the installation in the shop allows some construction to be done earlier than it can be done on-site. The team can identify opportunities to begin the electrical installation early.

Principle #7: Improved vendor coordination. The team is involved in the specification, procurement, installation and start-up of equipment, with more opportunity to work closely with equipment vendors and add value to the project. The vendor becomes a project team member.

Principle #8: Plant start-up. A single source of service speeds up your plant's start-up by minimizing coordination and start-up delays. ■

Item (Labor and Material)	Percent of Cost
Wire, cable and raceway	55%
Switchgear, transformers and MCCs	24%
Special systems	10%
Lighting and grounding	7%
Miscellaneous	4%

Note: Labor makes up 46% of the total costs; materials make up 54%.

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