THE PROJECT

Growing to meet future energy needs, a new pulverized coal-fired unit is currently being built at the existing generating station in eastern Trimble County, a 2,127 acre site near Bedford, Kentucky. Upon completion, Trimble County Two (TC2) will put into service a 750 MW advanced supercritical, pulverized coal-fired unit with world-class environmental controls. The current timeline puts this new generating plant, TC2, on schedule for commercial service in 2010. Once online, TC2 will be the cleanest and most efficient coal-fired unit in Kentucky.

Louisville Gas and Electric Company (LG&E) selected Bechtel Power Corp., a division of one of the world’s premier engineering, construction and project management firms, to design and build TC2, the second generating unit at the company’s Trimble County facility. Since its founding in 1898, Bechtel has worked on more than 22,000 projects in 140 countries, including hundreds of power generation facilities.

The myriad weld challenges on this project prompted Bechtel to select Gulco’s Pipe Kat Orbital Welder. Factors contributing to this decision include safety, reduction of labour, increased production, greatly increased travel speed of the weld and its customizability. Ease of use, ease of training, reliability and accessibility to the weld were also significant considerations.

THE CHALLENGE

Given the scope of this expansion and the type of weld demands, conducting business the conventional way simply wasn’t going to cut it. Increased on-site challenges called for a more customizable tool. The range of orbital welding applications made possible with Gulco’s Pipe Kat proved it to be Bechtel’s ‘go to’ tool for the TC2 expansion project. Now able to automate those tasks that formerly would have been accomplished manually contributed greatly to the project’s ability to remain on schedule and to meet budgetary constraints.

The L90 pipe chosen for this particular expansion at TC2 required several inches of wall thickness which, ordinarily, would have meant time consuming welds (using a manual stick welding process). Instead, a technique was developed whereby the pipe would be welded with automatic orbital welders. Given their experience with it, Bechtel prefers Flux Cored Arc Welding and today, the Pipe Kat is one of the few commercially available units using this process. As well, the Pipe Kat works with most conventional power sources. It’s capable of welds on pipes ranging in size from 10-24 inches, and typical wall thicknesses in the 3-4 inch range.

Speed, economic feasibility and quality welds are the crucial demands.

THE PARAMETERS

- Travel speed: 6.2 - 7.0 IPM
- Arc Voltage: 24 - 25V
- Amperage: 180 - 190A
- Torch Angle: 5° - 10° Push
- Oscillation Speed: 40IPM
- Side Dwells: 0.1 - 0.25
**THE SOLUTION**

Automated orbital welding systems actually enhance an operator's ability to make controlled, repeatable, high-quality welds. Manual welding on the other hand is slower and subject to human error. Using the welding automation means the labor force at TC2 produces a greater number of welds in less time. With this kind of orbital welding equipment, heat input can be controlled and limited, no matter which operator produces the weld. This way, you can be assured that your welding procedure will be executed precisely.

Make no mistake, when it comes to orbital welding, while many of the variables are now controlled and there's a greater degree of accuracy, the operator's role remains a significant one. Inputting the settings, preparing the tube ends, centering the components to be welded in the fixture block, mating the weld head to the fixture block, initiating purge and shielding gases and signaling the machine to begin the welding process all falls to the operator.

When the operator starts the weld, an electrode housed inside the weld head rotates in a precise orbit around the tube. This highly controlled process ensures that high-quality welds can be produced on a consistent, repeatable basis. The orbital welding system automatically starts and completes the weld, regulating arc current, travel speed, and other variables to provide a successful weld.

**THE RESULTS**

Bechtel's Don Kriesche said, “The quality of the weld, the 37 ½ degree conventional bend and flux cored arc welding process that helps us save on labour costs demonstrates that the Pipe Kat is, hands down, the way to go on a project of this type. Our schedule is tight so throughout the process you need control which a conventional weld doesn't necessarily produce. And, we found that training on the Pipe Kat takes much less time than on other comparative units.”

“The Pipe Kat helps us eliminate expenses you just don't have to have on a job of this magnitude. Even one bad weld will cost us in materials. The Pipe Kat produces more welds with fewer people and allowed us to use half of the man hours we otherwise would have. While this was our first time using the Pipe Kat on site, it certainly won't be our last,” declares Kriesche.

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