400-ton generator stator setting on Goldhofer platform trailer shortly after being rolled off of a barge at the Port of Alexandria

A 10-month power plant project in Louisiana wraps up with Bigge Crane & Rigging hauling, lifting and placing more than 70 components with weights of up to almost 300 tons. **ACT** reports

From the ground up

Power plant construction has become big business for Bigge Crane & Rigging. The company was contracted to carryout all lifting and heavy transport operations on the construction of a new generating unit at Cleco Power's Rodemacher Plant, which is located on a 6,000-acre site in Lena near Boyce, LA.

As well as hauling and placing more than 70 heavy components with weights up to nearly 300 tons, Bigge designed innovative rigging to enable the boiler modules to be largely assembled on the ground, minimizing high-risk working at height for the main contractor.

Cleco Power announced plans for the construction of the new $1 billion solid-fuel generating unit using circulating fluidized-bed technology back in July 2005. Cleco wanted to diversify its fuel mix and lower electricity costs for its customers. It will be the third unit at Rodemacher.

Hauling boilers

Unit 1 is fueled by natural gas and low-sulfur fuel oil and can produce 440 megawatts of electricity. Unit 2 is fueled predominantly by coal from Wyoming and can produce 523 megawatts. Together, the

Hoisting tower traversing the elevated runway toward the stator setting location

two units produce a total of 963 megawatts. The third generating unit will be capable of producing 600 megawatts of electricity from two 300-megawatt boilers.

Work on the third unit began on site in February 2006 and is expected to be completed by the end of 2009.

Bigge began working on site in April 2007. The first phase included hauling the supercritical boiler modules. The modules, 32 feet wide and 56 feet long, were assembled at a remote location on the site and then hauled to the boiler for installation. Bigge used its self-propelled Goldhofer platform trailers arranged in a three-file configuration, 16 feet wide.

"The eccentric center of gravity of the boiler modules provided much more of a challenge than the actual size and weight of the components," explains Pete Ashton, vice president major projects at Bigge.

The next phase of Bigge's work involved lifting various boiler components, including the steam drums and boiler modules. Bigge first set the two 190-ton steam drums using a pair of strand jacks mounted on top of the boiler steelwork to lift the drums 165 feet to their final elevation.

Later, Bigge returned to lift the boiler modules. Again, strand jacks were mounted on top of the boiler building steel, with four strand jacks for each unit. The strands were connected to a lifting frame, designed and supplied by Bigge, and which was then used to support the boiler module as it was raised to its final elevation. The modules varied in weight from 175 tons to nearly 300 tons.

Ever challenging

The eccentric nature of the loads that had earlier posed a challenge during their transportation was no problem during the lifting. "That is because our strand jacks, manufactured by Hydrospex, are computer-controlled," says Ashton, "which means that the four jacks all work together and remain perfectly synchronized throughout the lift with absolute precision."

Bigge was also called on to deliver the generator to the site. The generator stator arrived by barge at the Port of Alexandria, about 20 miles away from Lena, LA in September 2007. With Hurricane Humberto gathering pace in the Gulf of Mexico, Bigge's crew braved torrential rains to roll the 380-ton stator off the barge and transported it about a mile to a rail siding, where it was loaded on schedule onto a heavy duty rail car that took it to site.

Back on site, Bigge received the stator at the site and offloaded it from the rail car using its new 700-ton capacity J&R Lift-n-Lock hydraulic gantry system. To expedite the schedule, the general contractor decided to install the terminal box on the bottom of the stator before rough setting, instead of after it was in the air. Though the box weighed only about 20 tons, being attached to one end of the stator mean that it shifted the center of gravity and added about 10 feet to the overall height of the unit.

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After transporting the bare stator from the rail siding to the hook, Bigge crews lifted the stator from the transporter and constructed temporary supports underneath the stator so that the terminal box could be installed without anyone working under a suspended load. After the box was attached, Bigge crews quickly adjusted the position of the rigging to ensure a level lift and began raising the stator assembly. The remainder of the lift went smoothly as the load traversed the runway and the stator was set in place.

Safety first

In the final phase of its project scope, Bigge furnished a slide system on which the condenser halves, each weighing about 425 tons, would be constructed outside of the building and then slid into place upon their completion. Although it is now quite common to construct the condenser sections outside of the power block and then roll or slide them into place, there was some initial concern that there may not be adequate clearance to do so on this project. Bigge's team was able to demonstrate that

its slide system's low-profile design allowed for more than enough clearance to complete the work as planned.

"The biggest challenge with this project," says Ashton, "was developing a method to lift the boiler modules. Each module arrived on site in six sections, which were then assembled into the larger modules at a remote area of the site. The general contractor's desire to set the boiler sections as pre-assembled modules represented a new approach to boiler construction and, as such, required a unique rigging solution."

It was decided early on that strand jacks supported on the boiler roof steel, rather than a large crawler crane, would be used to lift the boiler modules. Even if the modules could be handled with a crane, the rigging would be very complicated and would need to be unique for each module because they each had different centers of gravity. With the strand jacks, the rigging could be much simpler and identical for every module. As well as saving time and money, they also offered an added degree of safety.

Bigge's challenge, however, was to develop a rigging method that did not require the boiler fabricators to leave large openings in the modules for the strands and anchors to pass through in the setting operation. Recognizing that the weight of the modules was well below the lifting capacity of the four strand jacks that would be used to raise them, Bigge engineers came up with an optimized strand pattern that allowed the strands to pass through the boiler tubes without the need for any tubes to be moved.

Finnishing up

The next challenge was to develop a way to support the boiler modules from below during the lift. It was decided that a portion of the shipping steel for the individual sections of each module would be left in place to support the modules during assembly and transportation. Bigge's team designed a lifting frame that would engage that portion of the shipping steel so that the module could be lifted while being supported from below. The main support beams on either side of the frame were set on cribbing and spaced such that the transporter could pass between them and lower the module on to them.

After removing the trailer from under the load, cross beams were installed between the main beams. Finally, the strands were attached to the lifting anchors mounted on the main beams. The module was then lifted to its final elevation. After the weight of the module was transferred to the hangers, the remaining module shipping steel was cut loose from the module and lowered to the ground using the lift frame. act