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Master minds

Sarens installed the world's largest fixed ship loader at the Convent Marine Terminal in Louisiana.

Providing strategic access to seaborne markets for coal and other industrial materials, the SunCoke Energy Partners' Convent Marine Terminal (CMT) in Convent, LA is one of the largest export terminals on the U.S Gulf Coast. Since acquiring the facility in 2015, SunCoke has invested \$20 million to modernize and expand operations with the addition of the largest shiploader ever constructed.

SunCoke enlisted Sarens' engineering team to plan and perform the challenging job of erecting the massive shiploader at CMT. Located on a jetty that is inaccessible to heavy machinery by land, the Sarens engineering team developed a lift plan that included the use of a 300 by 100-foot barge to float the largest and heaviest crawler crane ever used on a barge for this type of operation in North America, the company said.

To successfully accomplish this, the engineers needed to account for the weight of the crane and the redistribution of the material's weight by extensive ballasting throughout the rigging and lifting process as the shiploader pieces were placed on the platform.

The shiploader arrived at the CMT site by barge in 10 pieces; the heaviest of the pieces weighed 450 tons. To perform these

incredible lifts, the Sarens team selected a Terex CC 6800 crawler crane from its fleet along with a superlift wagon and ballast system. The crane was outfitted with the Sarens SARspin rigging system to help level the load through the use of four hydraulic cylinders.

Sarens' Terex CC 6800 crawler crane was transported from overseas directly to the barge in the port of Chalmette, LA., where a team was waiting to assemble the crane on the barge. This took eight days. Using a SSL configuration with a 72-meter long main boom, the crane was outfitted with a 500-ton hook block with 2 x 10 lines and two runner lines, a superlift wagon with 450 tons of weight. Additionally, to ensure proper load distribution of the weight of the crane and the material being lifted on the barge, load spreading mats were used. To reduce the ground-bearing pressure even more, a special setup reducing the crane's counterweight to 170 tons and the central ballast left off completely to help better distribute the weight on the barge.

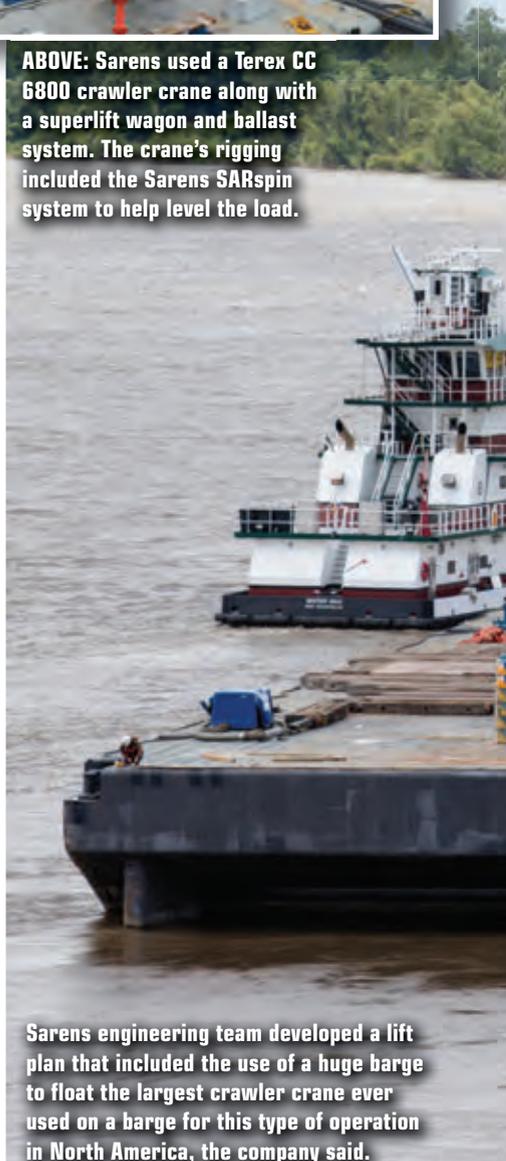
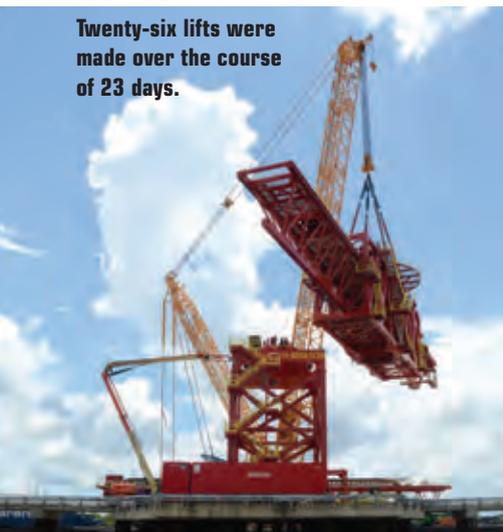
After assembling the crane, the barge with all of Sarens' equipment was then transferred to the CMT site. The shiploader structure also arrived via two barges from a port in Tampa, FL.

Onsite, the barge with the crane was positioned next to the shiploader platform and tied off to the jetty using mooring winches that would allow crews to reposition the barge during the erection process. The barges with materials were then positioned on the other side of crane's barge. The water current/velocity on the Mississippi River is very high with high fluctuations and fairly unpredictable changes. Furthermore, the site is located in a turn in the river, creating a push of the barge away from the jetty. A proper mooring arrangement using hydraulically driven winches was used to stabilize and position the barge for each lift.



ABOVE: Sarens used a Terex CC 6800 crawler crane along with a superlift wagon and ballast system. The crane's rigging included the Sarens SARspin system to help level the load.

Twenty-six lifts were made over the course of 23 days.



Sarens engineering team developed a lift plan that included the use of a huge barge to float the largest crawler crane ever used on a barge for this type of operation in North America, the company said.



As the crane lifted each piece, water had to be pumped in on the other side of the barge to balance the additional weight.

Lift execution

“To execute a project of this magnitude and complexity was challenging,” said Steven Sarens, director of Sarens’ Houston operations. “Anytime we’re performing a lift from a barge, it’s important for everyone to be 100 percent focused and concentrated. An adequate

preparation and consequently following the step-by-step procedures are key when performing these complex operations. The process involves more than just lifting and swinging material into place; operating a large crane on a barge is a slow and delicate process that requires adequate coordination.”

A total of 26 lifts were made over the course of 23 days, including three towers and three boom sections. To begin each lift, the crane was walked over to the material facing side of the barge, and the initial pick was executed. As the crane lifted each piece, water had to be pumped in on the other side of the barge to balance the additional weight. From there the crane would begin swinging the material around. The crew would have to stop frequently to add more water until a full 90 degrees was achieved. Once the material was aligned with the crane’s barge, the operator slowly walked the crane over to the shiploader side. Again, water needed to be pumped to the other side to balance the shifting weight of the crane and the material. Finally, when the crane was in position, the full 180-degree swing was completed. The process usually took between 2 to 3 hours, depending on the size and weight of each piece being lifted.

The crane’s ballast wagon helped to keep the crane and material balanced on the barge, as well. The wagon was strategically positioned throughout the lifting process to keep weight evenly distributed on both tracks.

“The SARspin saves a lot of time on jobs – especially one like this,” explained Sarens. “During the assembly process, a correct positioning of each load, whether it being perfectly level or under a certain angle, facilitates the process. This type of rigging equipment lets the crane operator make fine adjustments through a wireless remote control at any time during the lift.”

The flexible setup also helped the Sarens team better adapt to changing weather patterns and water velocities.



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“From the equipment we used to the way we set everything up, we knew we needed to have the ability to make adjustments during each lift,” said Sarens. “We developed an excellent plan and did a good job of making onsite adjustments.”

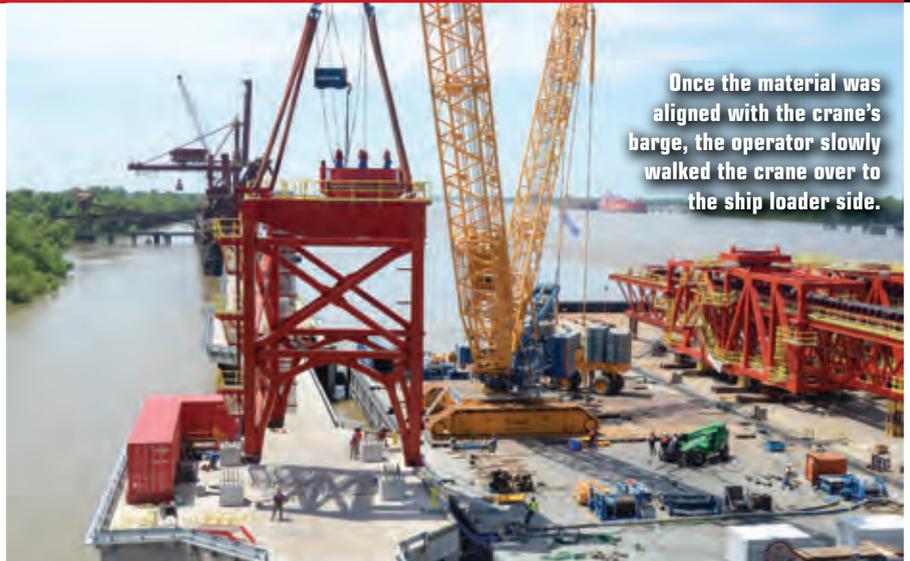
Sarens had 12 workers on the project. When the crane wasn't swinging, the team was assembling pieces of the shiploader and constructing a conveyor system.

Additional CMT projects

The Sarens team has been working on several projects at SunCoke's CMT location over the past several years. They have installed stacker reclaimers and are in the process of replacing the existing conveyor system for another ship loader – a project that also calls for the use of a crane on a barge.

Erecting the world's largest shiploader using the largest heavy crawler crane ever installed on a barge in North America is no easy task. It took the expertise of Sarens' worldwide team to make a job like this one go smoothly, Sarens said.

Sarens, a Belgium-based family owned company, has been providing heavy lift, engineered transport and specialized



Once the material was aligned with the crane's barge, the operator slowly walked the crane over to the ship loader side.

rigging services for more than 60 years. Today the company, which operates in 60 countries on six continents, has more than 4,500 employees whose motto is “Nothing too heavy, nothing too high.”

SunCoke Energy Partners is a publicly traded master limited partnership that manufactures high-quality coke used in the blast furnace production of steel and provides export and domestic coal handling services to the coke, coal,

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