



Reviving a giant

IMAGE SOURCE: MANITOWOC COMPANY, INC.

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- Maniowoc's EnCORE program has fully refurbished a Maniowoc 4600 lattice-boom crawler crane for the Angra 3 nuclear reactor project in Rio de Janeiro.
- The refurbishment involved 12 experts from Brazil and the U.S. over 22 months, replacing over 600 critical components due to severe corrosion.
- The crane's unique ringer configuration allows it to lift heavy parts from long distances, making it more cost-effective than renting a higher-capacity crane.
- The EnCORE team also updated the crane's operating system and installed a modern load monitoring system for efficient operation.

- The Manitowoc 4600 has been a significant part of the Angra Nuclear Power Plant's history, previously used for constructing Angra 2 and now set to build Angra 3.
- Angra 3 will significantly boost nuclear energy production in Brazil, generating 60% of Rio de Janeiro's electricity consumption.

Thanks to **Manitowoc's** EnCORE program, an iconic Manitowoc 4600 lattice-boom crawler crane is back in action. After a dedicated refurbishment by a team of experts from Brazil and the U.S., the crane is ready to build Angra 3—the third and final reactor at the Angra Nuclear Power Plant in Rio de Janeiro.

Manitowoc's EnCORE team has fully renovated a Manitowoc 4600 lattice-boom crawler crane in Angra dos Reis, Rio de Janeiro. Purchased by the Brazilian state company Eletronuclear in 1982, the crane was used to construct Angra 2, the country's second nuclear plant. Now, the remanufactured crane's new mission is to build Angra 3, the third and last reactor at the Angra Nuclear Power Plant (NPP).

The refurbishment took 22 months and involved 12 EnCORE experts from Brazil and the United States. Ricardo Cunha, product support manager at Manitowoc in Brazil, explained that the crane was kept idle outdoors for almost six years and suffered severe corrosion damage from direct exposure to rain, extreme heat, and salty sea winds.

"As we disassembled the equipment, we needed to replace parts of the structure and more than 600 critical components, including motors, pumps, valves, and sensors. Some of these parts were not easy to find — it is a unique crane that was mounted in a ringer configuration. There are not many others like it in the world," Cunha said.



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The uniqueness of the Manitowoc 4600 is exactly what made Eletronuclear opt for a complete refurbishment instead of purchasing a replacement crane. The crane's main boom is positioned on the ringer, supporting the counterweight. The configuration ensures greater lifting capacity in larger operating radii when compared with other similar cranes. The crane will erect parts weighing up to 80 t at a height of 42 m and a radius of up to 60 m.

"Because of the ringer configuration, the 600 t-capacity Manitowoc 4600 crane can lift very heavy metal parts used to construct the plant's reactor from a long distance. If they had opted for new mobile equipment, they would have to use a crane with much higher capacity to carry out the same task," Cunha explained.

Bruno Bertini, head of the electromechanical assembly department at Eletronuclear, explains that his team completed a cost analysis and concluded that renting a crane of higher capacity would have cost much more

than refurbishing their 4600.

“The savings from rebuilding the 4600, compared to renting another crane, were crucial. Additionally, having Manitowoc, the manufacturer, lead this project gave us the reassurance to go for a complete and certified renovation,” Bertini said. “We knew that it would be a big challenge, but throughout the process we saw Manitowoc’s commitment to the quality of the service provided.”

In addition to replacing parts and components, the EnCORE team has updated the crane’s operating system and installed a modern load monitoring system, providing the operator with crucial information to work efficiently.



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Vital part of the project

For 40 years, the Manitowoc 4600 lattice-boom crane has been part of the landscape at the Central Nuclear Almirante Álvaro Alberto complex, where the three Angra plants are located. After building Angra 2, in 2000, the crane was assigned to build the third reactor. In 2011, the crane received a few upgrades and continued working on the site until 2015, when construction was halted. Project planning resumed in 2021 and Eletronuclear contacted the Manitowoc team to refurbish the 4600 crane as a vital part of resuming the construction project.

“This is the largest and oldest machine in our yard. It is part of the history of Angra NPP. We often receive nostalgic messages from former operators asking about the crane’s renovation and when it will work again. It is fantastic to see it fully renovated, ready to return to work,” Bertini said.

Brazil’s two nuclear reactors, Angra 1 and Angra 2, generate about 2% of the country’s electricity. With Angra 3, nuclear energy will generate the equivalent of 60% of consumption in the state of Rio de Janeiro.

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CRANES

CRAWLER CRANES