

Case Study

A large, dark-colored electric rope shovel is being lifted by two green Enerpac JS-500 jacks. The shovel is positioned vertically, and its massive size is emphasized by the surrounding industrial equipment and the yellow crane arm on the right. The background shows a rugged, mountainous landscape under a clear sky. The text "Enerpac's JS-500 Jack-up System Selected to Undeck Electric Rope Shovel in Copper Mine" is overlaid on the image.

Enerpac's JS-500 Jack-up System Selected to Undeck Electric Rope Shovel in Copper Mine

Elko Wire Rope, a privately-owned provider of manufactured rigging products in the mining industry, selected Enerpac's JS-500 Jack-up System to undeck an electric rope shovel at a copper mine site located in Southwestern USA. The entire upper works of the rope shovel needed to be lifted for an inspection on the bearings and have maintenance repairs performed. The machine weighs approximately 1,500 tons, requiring lifting with significant force and control.

Typically, the solution for this kind of lift is using custom long stroke cylinders or doing a staged lift, which gets the job solved, but not entirely. Elko was looking for a more sophisticated, next level solution to be able to provide to their mining customers for this particular application, as well as for other heavy lifting jobs.

Enerpac introduced their JS-500 Jack-up System to the Elko team as the solution and provided extensive information on how it would work for this particular application. After analyzing all the information and talking through the features, benefits, capabilities, and ease of implementation and mobilization in the field, Elko chose to invest in a new product and a new way with Enerpac. "It was a perfect match," said Mike Beres, Sales Director-Americas for Heavy Lifting Technology at Enerpac. "We have the product to do the lifting of the equipment and Elko has the capability for building the attachments to integrate to the equipment. They have extensive knowledge of tooling to adapt to the shovel."



The JS 500 Jack-up system has a lifting capacity of 2,000 metric tons.

"This will be the first time a shovel is undocked using Enerpac JS equipment," said Beres. "We have had animations and idea builders that we have shown customers, but only Elko has taken the leap with us for this application. We look forward to the partnership with Elko and what the future may bring."

The jack-up system is a custom developed multipoint lifting system. A typical system setup includes four jack-up units positioned under each corner of a load. A four-unit setup has a lifting capacity of 2,000 metric tons (500 tons per unit).

Enerpac's jack-up system is operated and controlled by a computer control unit known as SCC or Smart Cylinder Control. Each unit's lifting or lowering operations occur simultaneously with others connected; the SCC's synchronous technology keeps the load under control and within the level tolerance programmed. Load readouts for each JS unit are shown on the operator screen and are used to calculate where the center of gravity is within the stability triangle for the lift. "The smart



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cylinder control makes for a comfortable process,” said Corey Reynolds, Commercial Manager at Enerpac. “The customer gets a good understanding of what they are seeing on the computer screen and feel confident operating on their own.”

The hydraulics power units are embedded within each unit’s lifting frame. The large width of the system makes it stable and allows side loads that are superior to basic cylinder setups. Additionally, when the load is landed onto the tower, the load is held mechanically versus being held on hydraulic oil thereby increasing the safety of the operation.

The first part of the job required significant prep work to prepare the ground for the assembly of the jack-up system for the lift. The ground needed to be compacted and leveled to achieve a stable state without any seen settling to withstand the entire 60 days of the project operation. Once the pad prep was completed, the rope shovel was moved to the maintenance area to remove the dipper sticks, bucket and any unnecessary weights that do not need to be lifted and then returned to the pad to perform the lift. The process took 16 hours for the move.

The team then positioned two jacks under the counterweight in the rear and two under the main boom section. The alignment was checked very closely to make sure they were lifting under the correct parts to ensure no damage would take place. Elko also fabricated and welded lifting jigs to the front of the machine.

In addition to the JS-500 Jack-up system, Elko also used Enerpac’s EVO synchronous lift system under the car body to make small adjustments to the alignment of the center pin going through the center of the machine as they lifted the upper revolving deck. The lift depends on the accuracy of clearing the center pin.

“While the lift was being done the team monitored the level of the car body and upper revolving deck from inside the machine to confirm clearance around the pin and to make adjustments to the car body with the EVO system, all while



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they did the lift on the outside with the jack-up system,” said Reynolds. “This was a unique feature for shovel undecking that hasn’t been done before.”

“Once the revolving deck was high enough above the car body to clear the center pin, which was 25ft high, we were able to easily lower the deck down 15 feet and build a stage and reach the revolving deck without needing ladders. The flexibility to raise and lower makes maintenance operations more friendly and ergonomic.”

“The Enerpac JS-500 Jack-up System is truly an innovative solution to use for undecking,” said Neely Hammond, Manager at Elko Wire Rope. “The automation is smooth, safe and you have the ability to add barrels to the system to go as high as you need. Other products have set limits, and with this, we can go up 40-50 feet high. We are excited to continue lifting with different heights and weights on future projects.”

For more information on the Enerpac JS-Series Jack-Up System visit, www.enerpac.com.