

MONGOLIA

Crane Technology Will Slash Mineshaft Pre-Sink Time

The world's fifth largest mine, Oyu Tolgoi in Mongolia, will use advanced techniques enabled by pioneering crane design to fast-track the pre-sink phase at Shaft 6.

The time needed will be dramatically reduced by a Condra portal crane that combines a very rapid lift speed with optimised cross travel to waiting dump trucks.

Pre-sinking is expected to be completed in less than a quarter of the time considered the norm – four months instead of the usual eighteen.

The Condra portal is radically different from the level-luffing type of crane traditionally used for pre-sinking. Instead, a high-speed, high-lift main hoist removes excavated spoil vertically, by kibble, through an opening in the centre of a drilling stage positioned by two separate stage-winders mounted on the same portal frame.

Lift speed is an impressive 1 metre per second – fifteen times faster than the 4 metres per minute found in standard mine workshop applications.

South Africa-based Condra researched its advanced portal design during 2013 for incorporation in a prototype machine used at a new diamond mining shaft the following year.

In addition to an innovative frame design and dramatically increased lift speed on the main hoist, the portal crane also incorporated improved drives, gearboxes and safety devices, better cabin access and enhanced operation by remote control.

Oyu Tolgoi Shaft 6 will have two of these Condra portal machines.

During the pre-sink phase, they will stand over the mouths of the main and auxiliary rescue shafts, and remain in place until the shafts have been drilled, blasted, supported, cleaned and lined with concrete.

Oyu Tolgoi is a combined open pit and underground mining project located some 550km south of Mongolia's capital, Ulaanbataar, within the Gobi Desert. The mine, still under development by Rio Tinto, began producing copper and gold concentrate in 2013. It is the largest mining project in Mongolia's history.

Condra began manufacture of the first of the portals for Oyu Tolgoi in early July, when the long-lead assemblies order was received.

The main order was received on July 24th.

Oyu Tolgoi's pre-sink cranes will be bigger and faster than the diamond mining machine, and will feature improved electronics.

Importantly, lifting speed of the 160kW 15-ton main hoist on the new portals will double to 60 metres per minute.

The portal frame itself will comprise a 14-metre high, 12-metre span extended by 3,2-metre cantilevers on both sides to allow excavated spoil to be moved to dump trucks using roads adjacent to the shaft. Stairwells will replace the cat ladders of the diamond mine portal.

Below-ground lift height will be 100 metres, and the complete machine will weigh 88 tons.

Completion of both cranes, the design of which makes provision for disassembly and containerisation, is scheduled for early November this year.

They will be shipped to Mongolia via China.

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PHOTOGRAPHS SHOW (two views):

The pre-sink portal crane custom designed and manufactured by
Condra for a diamond mine in 2014

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