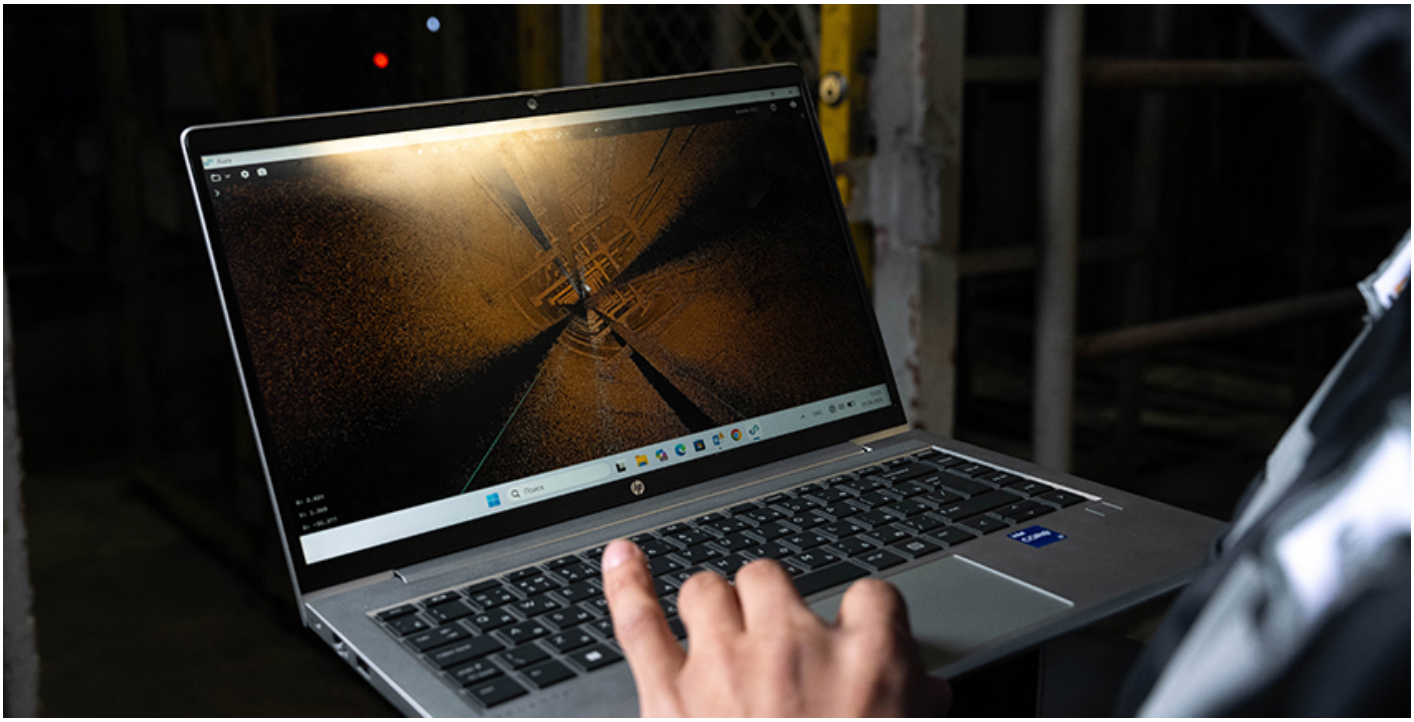
Eurasian Resources Group Is Developing a Digital Twin of One of the World’s Largest Chrome Ore Mines



Eurasian Resources Group (ERG), a leading metals and mining company, is developing a digital twin of one of its key underground infrastructure assets. As part of the project, TNC Kazchrome JSC has for the first time carried out high-precision laser scanning in-house on a kilometre-long skip shaft at a depth of more than 600 metres at the Bolashak mine of the Donskoy Ore Mining and Processing Plant (Donskoy GOK). The new technology will help identify potential hazards at an early stage, improve operational safety, and support more accurate planning for the operation and maintenance of mine infrastructure.

The Bolashak mine was commissioned in 2024. This is one of ERG’s largest investment projects, with more than KZT 877.6 billion invested in its construction. The mine has a design capacity of 7.5 million tonnes of chrome ore per year.

The skip shaft is essentially the main means of transport at the mine. It is used to transport personnel into and out of the mine and to hoist ore and rock to the surface. The condition of the shaft has a direct impact on the safety of personnel and the continuity of production.

Previously, the company engaged third-party contractors to inspect the shaft. The work is now being carried out by the plant’s own geotechnical team. As part of the survey, specialists have performed laser scanning of the 1,047-metre-long shaft to a depth of 627 metres. Modern equipment has enabled them to capture millions of measurements and build a detailed 3D model of the site without halting production.

The resulting data make it possible to monitor the shaft geometry with a high degree of precision, track the condition of its structures and detect even minor deviations that could eventually affect the operation of the hoisting system.

“Digital technologies have become an integral part of mining operations. We can now obtain not just a snapshot of an asset but a digital model that can be used to analyse its condition, predict changes and make decisions based on accurate data. This has a direct impact on operational safety and the reliability of mine infrastructure,” commented Koptileu Shukirbayev, Chief Geotechnical Engineer at Donskoy GOK.

The specialist added that the digital twin developed by the company would enable it to shift from responding to issues after they arise to predicting them. Engineers will have a tool for identifying potential hazards at an early stage, planning maintenance more accurately, and preventing unplanned equipment shutdowns.

So far, the survey has been completed along one side of the skip shaft. The next stage will involve scanning the opposite side. Once the work is complete, the company will have a full digital twin of the asset, providing a basis for further monitoring and analysis of its condition.