Sandvik leaders on what's next for surface drilling automation

Executives stress process, safety and data as keys to mining's autonomous drilling future

By Munira Rajkotwalla

Sandvik's automation team describes the future of surface drilling as less a race to deploy machines on scale, and more of a careful process of aligning technology with mining realities.

Speaking with *Mining Magazine*, Sandvik's surface drilling and automation product leaders emphasised that scalability, interoperability and process change will be the decisive factors in successful automation deployment.

Severi Eerola, product line manager for AutoMine Surface Drilling, shared that the company has "a product offering for autonomous drilling that is very scalable, from onboard automation to different types of operation setups."

"One of the differentiators to the competition is that we have the same automation solution, AutoMine, that can host both the boom drills and the blast hole drills in the same system."

DIFFERENT STAGES OF READINESS

The idea that automation must fit mines at different stages of readiness echoed throughout the conversation.

While a large, established site might be ready to manage a fleet of 15 rigs from a control room, a smaller or newer operation could start with one automated drill running under line-of-sight control.

"The scalability to bigger fleets is one of our key differentiators



Sandvik surface drills powered by AutoMine
Photo: Sandvik

compared to the competition," Eerola said.

Hardware and software commonality across the company's surface portfolio also plays a central role.

"All the automation solutions are available on all of our iSeries drills," said Atif Khan, senior manager for Automation in Rotary Drilling division. "That also translate[s] over to our new electric series drills too. There's no difference."

SHARED KNOWLEDGE

Khan noted that software development at Sandvik spans both underground and surface divisions.

"We use a common platform so that when our machines hit the field at the customer site, they have a very similar look and feel. Once we've developed this interface with AutoMine for one of the drills, it automatically becomes available across all of the different rotary drill models as well," he said.

The scalable automation architecture Sandvik describes is tied to what it calls the iDrill platform.

On the platform, integrated automated drill functions allow the operator to initiate complex sequences with a single command, while precision navigation systems guide the rig according to a digital drill plan.

TECHNOLOGY AND PROCESSES

The company's AutoCycle function can carry out the full drilling process, including hole-to-hole tramming, without operator involvement, freeing personnel to manage additional rigs or focus on exceptions.

Path planning tools and Sandvik obstacle detection systems enhance safety and productivity, particularly in larger fleets where multiple machines operate in close proximity.

"Now that we've been there for some years, it's easily evident that it's actually less about technology and more about processes."

Many customers are taking a "step approach," he added, operating mixed fleets of manned and unmanned rigs.

DRILLING AND BLASTING

The technology itself is not the main obstacle, Khan said. "It's less about technology right now, even though for years and years, it was always a demand that the whole drill and blast must be automated at least."

This interaction is particularly important when integrating drilling and blasting cycles.

"Even if we automate the drilling, there's also the blasting side," Khan said. "We're working with blasting companies as well, to see how both parties can automate that together."

GLOBAL DEMAND

While automation has often been associated with large Australian mines, Eerola argued that the demand is now global.

"Australia has been leading [automation], but it's now happening in many of the regions," he noted.

Customer motivations vary. Some want to reduce the number of people in the pit for safety reasons. Others face shortages of skilled drill operators.

For productivity, Eerola said, the gains often come in the long term.

"Sometimes deploying automation drops the productivity in the beginning. But in the long term, it clearly increases."

WORKFORCE FLEXIBILITY

Beyond direct productivity, Sandvik also framed its automation in terms of workforce flexibility and operator welfare.

In control room configurations, a single operator can supervise several rigs without being exposed to the dust, vibration and noise of the bench.

Features such as FleetFlex allow control of any rig from any station, even across different geographic locations, enabling mines to draw on talent that may not be able or willing to work on-site.

In an official presentation, the company pointed to case studies where operators in a city-based office manage rigs hundreds of kilometres away, seamlessly handing over control between shifts or during breaks to maintain continuous drilling.

CUSTOMER DATA

Data management is another pillar. Anu Niittynen, product line manager for Digital Solutions, described how Sandvik collects and shares operational data.

"We collect basic productivity data. This data can be shared either to the cloud, to the local servers or to third parties."

Practical benefits come when data is actively monitored. Sandvik mentioned the case of a customer experiencing higher tool consumption than expected.

Remote monitoring identified configuration changes that were causing the issue, adjusting the settings improve tool use significantly.

Another customer used measurement-while-drilling data and identified additional raw materials, improving excavation productivity.

The company is clear about data ownership. "We always see it as the customer's system. It's customers' data, and they have full access to it," said Eerola.

INTEROPERABILITY KEY

Interoperability is a growing topic of interest for customers, the executives said.

While AutoMine currently operates only with Sandvik's own iSeries drills, Eerola noted the company's acquisition of Universal Field Robots in Australia as a route to integrating equipment from other OEMs on a case-by-case basis.

He also pointed to the need for industry-wide frameworks. "There's a great demand for greater interoperability before all these systems can easily happen," he said.

CULTURE IN FLUX

Safety, the executives stressed, is a key principle in Sandvik's design. But technical safeguards are only part of it.

"Autonomous operation requires a lot of training and learning, not only for the operators, but for the other people that are affected by deployment," Eerola said, citing simulators and e-learning packages as tools to speed change management.

Asked how soon fully autonomous drill-and-blast operations might be achieved, Khan was cautious.

"This is not something we'll be able to solve in six months or even a year. This is something that takes continuous R&D and continuous iteration."

He said key milestones would involve deeper collaboration between drilling and blasting teams, agreement on data standards, and long-term partnerships with customers willing to test and refine systems.

For now, Sandvik sees the most practical path in hybrid operations which mix manual and automated rigs, scaling autonomy as processes mature.

The great thing is that the offering is so flexible and scalable that it can adapt to customers' different targets and requirements," Niittynen said.

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