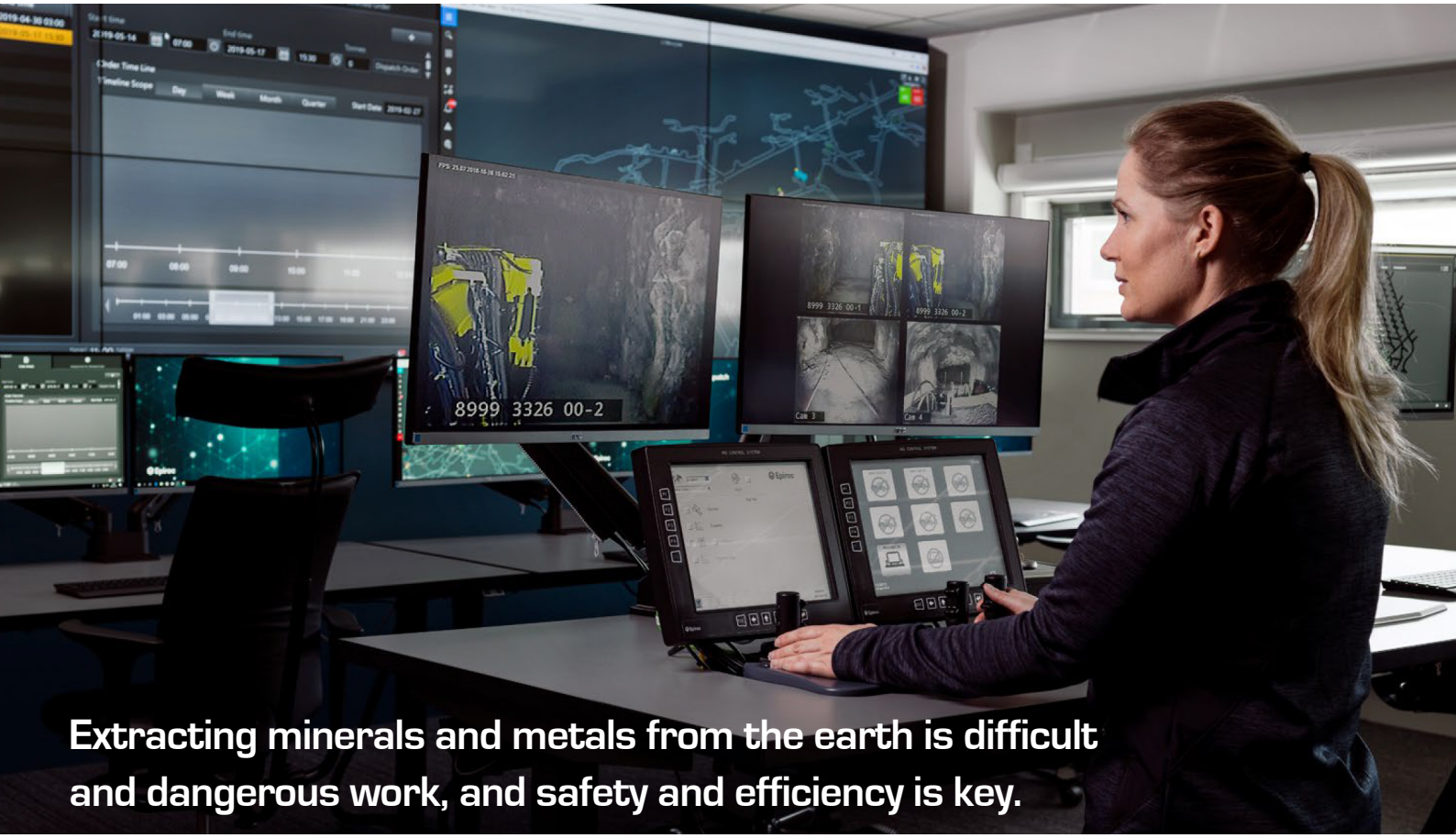
360VISION TECHNOLOGY

A leading global mining company choose Predator PTZ cameras for difficult and dangerous mining applications

Case Study: Mining



Extracting minerals and metals from the earth is difficult and dangerous work, and safety and efficiency is key.

One leading global mining company develops and provides innovative and safe equipment, such as drill rigs, rock excavation and construction equipment, and tools for surface and underground applications, to many of the world's biggest mining operations.

For some of the most difficult and dangerous mining applications, extracting raw materials like iron ore, chromium, zinc, gold, silver, lead and copper, drilling machines are operated remotely. The 'driver' sits in a control room and pilots their drilling equipment using sophisticated hardware and software. For its customers with mining operations in countries including Sweden, Ireland, Canada, Chile, Peru, and Finland, the mining equipment company relies on ruggedised, robust cameras to provide real-time control of mining equipment, for both safety reasons and to provide increased productivity.

For the past few years, the cameras they have used for this crucial role have been specially customised Predator Hybrid Ultra cameras from British manufacturer 360 Vision Technology.

A spokesperson for the mining company, the Team and Product Manager at its Automation subsidiary, explains further. "We utilise the Predator PTZ cameras for the benefit of the tele-remote operator, enabling them to receive visual feedback and guidance while controlling the drilling process. The cameras allow the operator to move the drill to the correct position and ensure everything is ok during drilling. If something goes wrong, the operator can engage an emergency stop button from the control room."

The first 360 Vision cameras were utilised in late 2019 and early 2020, the spokesperson says...

"We pioneered this tele-remote drill setup more than a decade ago," he continues. "Back then we were using a different brand of cameras, encoders and decoders. But these were discontinued with no suitable replacement available. In our quest for an alternative, we reached out to 360 Vision Technology.

"They helped us to get their Predator camera fully backwards compatible with our old system. Additionally, with their Hybrid version we are also prepared for the future, allowing us to transition into using IP camera technology."

The cameras are placed on the front left and right-hand sides of the machine cabin, in order to cover the front and sides of the equipment. The camera positions were chosen to provide the operator with the same viewing angles as if they were inside the machine cabin. Operators are typically highly experienced, having trained on and used similar machines in less difficult conditions, where they are able to operate the machine from within the conventional cabin position.

But even 360 Vision's industry-leading ruggedised cameras were challenged by the extremely harsh mining environments which the drilling equipment faces. There are extremes of low and high temperatures, excessive vibration and sudden shocks, as well as unexpected incidents such as being confronted with high pressure water jets bursting forth from within the rock and earth.

"It's an incredibly difficult environment for any camera, even one as famously robust as the Predator," the spokesperson said. "It tends to make cameras wear out due to the constant vibrations. This became even more noticeable as more and more of our customers began investing in automated mines, with operators working from a remote control station in an office – with the need for video feedback – rather than from inside the machine cabin. As a result, with more cameras shipped out, we were seeing more cameras fail due to vibration wear and water ingress.

"To address that, we have been working closely with 360 Vision Technology's R&D team to redesign the Predator camera body, to make it more robust and waterproof. That custom Predator model has now been verified by an accredited third-party laboratory as being able to withstand a machine lifetime of vibrations. That new version of the camera will be extremely beneficial to us."

Personnel install the cameras on machines in the mining equipment company's production facilities, and they are then operated by end customers on their sites. Most of these are monitored and controlled in control rooms far from the actual machines themselves, using specialist hardware and software equipment developed by the mining equipment company. On some sites an analogue monitor and a Pelco control keyboard is used inside the machine cabin.

"Currently video is transmitted via coaxial cable to an encoder, and from the encoder an IP signal, both Wi-Fi and LTE, is sent to the control room," the spokesperson explains. "In future we plan to run Predator cameras direct via IP, removing the need for the coaxial signal conversion, in order to provide better picture quality."

A typical setup will use two Predator cameras and a number of static cameras for each drilling machine. As well as enabling personnel to operate machines from a safe distance, in a controlled environment, a further benefit of this setup is that operators are able to control multiple machines, increasing operational efficiency.

Mark Rees. Managing Director at 360 Vision says the working relationship with their mining equipment partner has been an exceptionally close one and extremely rewarding.

"Our relationship with them has epitomised our company ethos, to leverage the feedback from our customers and more importantly, to understand the challenges they have when we evolve our ruggedised product portfolio. This partnership has certainly challenged the ruggedised aspect of our products! But with excellent collaboration and the work of our UK-based R&D team, we have not only produced a reliable alternative to their historic choice of product, but one that provides additional longevity and ROI."

"In addition, our Hybrid option provides our client with the ability to maintain an analogue solution now but with the ability to update immediately to IP HD at any later stage. There are very few environments as tough on cameras as the vibrations you get from drilling equipment, so I think our work on this project is a true demonstration of the ruggedness of our ruggedised solutions!"

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