Maestro Digital Mine

Real time data means more time at the face.

CASE STUDY

Plexus PowerNet™

Your last mile solution
To the face.

NEWMONT GOLDCORP™

Plexus PowerNet™ Case Study at Newmont Goldcorp's Borden Mine: Enabling the Digital Mine Starts with Connectivity to the Face

Identifying the mining industry's rising demand for real-time data, Maestro Digital Mine works with mining companies around the world, such as Newmont Goldcorp, to address the challenges associated with traditional communication backbone solutions (broadband and fiber).

Newmont Goldcorp's Borden Mine became one of the first mines to integrate Maestro Digital Mine's Plexus PowerNet™, which addresses the challenges associated with extending fiber optic-based communication backbone solutions for "last mile" data applications.

Newmont Goldcorp's Borden Mine is located in Northern Canada, 11 kilometers northeast of Chapleau, Ontario. Newmont Goldcorp is the world's largest gold producer, and approximately 15% of its direct gold production comes from Northern Ontario, Canada. The battery powered all-electric underground mine is the first of its kind in Canada.

Newmont Goldcorp is a proven leader in implementing innovative solutions into their operating mines, partnering with like-minded technology suppliers such as Maestro Digital Mine to improve health and safety performance and reducing greenhouse gas (GHG) emissions. Borden Mine first started using Maestro's digital ventilation technology, the Vigilante AQS™ air quality stations, to measure environmental conditions for worker health and safety and to reduce installation infrastructure costs. With this initial success, Borden Mine soon became one of the first mines to integrate the Plexus PowerNet™ which addresses the challenges associated with extending fiber optic-based communication backbone solutions for "last mile" data applications. The Plexus PowerNet™ system quickly extends communication and end-point power using copper coaxial cable to the face.

Addressing the Challenge

The Borden Mine all-electric vehicle fleet sets the conditions for a safer workplace for employees, while resulting in a smaller environmental footprint. Newmont Goldcorp expects to begin commercial production at the mine in the second half of 2019. Borden Mine depends on real-time digital technology and intelligent controls, including tele-remote technology to maximize equipment use for continuous mining. Part of getting an underground

mine online for production means embedding and advancing critical communication infrastructure throughout the mine and towards the face. Borden Mine uses fiber optic cabling as far as the level entry or electrical sub-station as do most modern mines. While fiber optic cable provides high data rates and reliability, it also presents challenges to the underground mining industry. Extending delicate, fiber optic cable to the high traffic headings like the mining face where the data is essential is challenging. Fiber optic cable can get damaged easily causing production delays. Terminating fiber underground is difficult, time consuming and requires expensive specialized training and a clean environment, which is frequently the biggest contributing factor limiting the advance of connectivity. At Borden Mine, 144 strand fiber cable is run from the surface control centre to each level entry via the ramp and terminated in a fiber patch panel where a CISCO network switch is added. Borden Mine was constrained with communications from the network switch out to the face.

Borden Mine required a durable solution that could bring both data and power to the face of each mine level that is easy to install, advance and repair with robust components that could be transparently integrated to a regular IP based network. The decision to implement the Plexus PowerNet™ solution was made in December 7, 2017 and the technology was integrated into the design and construction phase of the mine.

The Way Forward: the last mile Solution

The Maestro Team jumped at the opportunity to partner on this landmark mine and coordinated with Newmont Goldcorp's Team at Borden Mine led by Patrick Gilbert, Electrical Manager and Paul Fortin, ITT Infrastructure Analyst, to bring their team up to speed on the technology and how to install and use the Plexus PowerNet nodes.

Patrick goes on to say, "One of the advantages of the Plexus PowerNet™ nodes is that they arrive with the durable back plates already pre-drilled and with all the required electrical connection fittings. So, we just bolt it to the wall and go! For example,

On surface at Borden Mine with Patrick Gilbert, Electrical Manager - Photo courtesy of Maestro

> *Patrick Gilbert, Goldcorp remarked, "Plexus is easy to install, easy to advance and easy to navigate the webpages. All of this can be done by our technicians including any emergency repairs."*

when you are in a jam at the face, you just go the source of the damage, cut the coaxial cable and put a new section of the rugged coax on with a splice and you are back at it. Back in business! No time delays. For the IT department, the Plexus PowerNet™ delivers a high speed, low latency, low jitter digital communication network."

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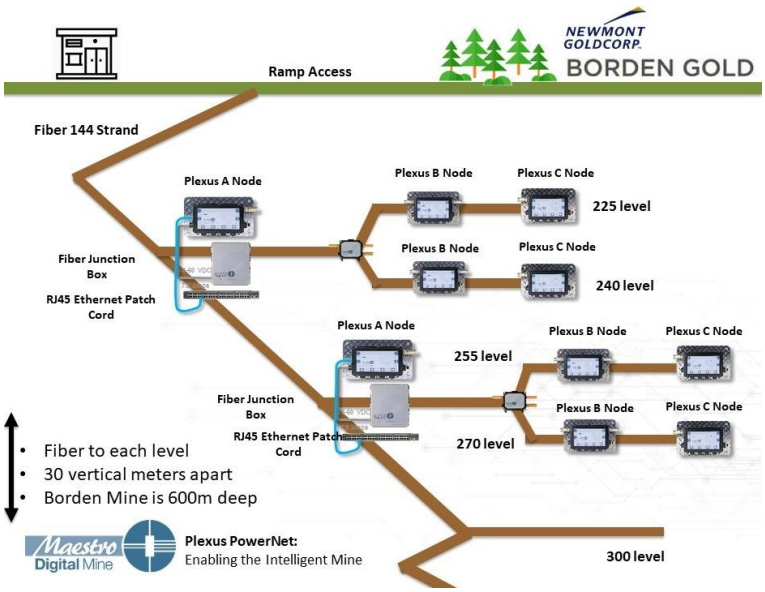
Outcomes

Newmont Goldcorp now uses the Plexus PowerNet™ in conjunction with CISCO access points to extend their network from the fiber patch panel to the internal workings. Their primary and most demanding application was to run Sandvik's – AutoMine® Lift-Haul-Dump (LHD) tele-remote application. Tele-remote applications increase safety by removing the miners from their most dangerous jobs and at the same time allows the LHD to return to the face immediately after a blast thereby increasing vehicle up-time as well as productivity. Borden Mine understood that without a reliable and high bandwidth connection, any automation project will fail. The Plexus PowerNet™ provided all of this and more.

The Plexus PowerNet™ nodes allowed Borden Mine to connect multiple devices such as high definition PoE+ (Power-over-Ethernet) cameras, Maestro's Vigilante AQS™ Air Quality Station, Tele-Op Laser Safety Barriers and Underground Fleet Telemetry at each level.

Newmont Goldcorp's Borden Mine continues to expand the Plexus PowerNet™ on each new level to provide a solid communication network in time for full production. Patrick Gilbert reflects, "The Plexus is a proven technology at Borden Mine, it works! We are at a critical time in our production schedule and the simplicity of the Plexus PowerNet™ is working well with the team and will play an important role for monitoring the activity and keeping our workers safe at the face."

Plexus PowerNet™ delivers a high speed, low latency digital communication network that provides PoE+ power to Wireless Access Points (WAPs), cameras and any other IP based device. The system eliminates the need for costly outside fiber optic contractors and can be installed and maintained by any internal tradesperson. Maestro is honoured to be collaborating with Newmont Goldcorp. Our clients come first; we believe in leaving no one stranded as we assist with integrating our digital solutions into operating mines in this digital age of mining, Industry 4.0!



The Plexus PowerNet™ is currently installed and being expanded at 22 mines in Canada, USA, Spain, South Africa, Mexico and Finland. Our current clients have compared other gigabit network solutions and concluded that CAPEX can be decreased in the area of 40-60% without any compromise of network speed or capability. The Plexus PowerNet™ can be used in mines with or without a fiber optic network. The Plexus has been designed for the quickest "last mile" of communication.

Plexus PowerNet™

The first gigabit network providing both data and power using coaxial cable.

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