

Infinet solutions supports mining beyond the Arctic Circle at the Nornickel quarry



The effective operation of a mining enterprise anywhere in the modern world is impossible without the use of modern computer technologies and automated process control methods. Mining above the arctic circle, where temperatures can reach -65°C , presented mining and metallurgical company **Nornickel** (until 2016 **Norilsk Nickel**) with a unique set of problems.

To improve its vital operational processes, it enlisted the help of **Infinet Wireless** to establish a mobile network. To ensure the effective distribution of equipment along supply routes, load control, prompt adjustment of the production process, and tracking possible violations, Infinet's solutions

were deployed to ensure the processes, crucial for the optimization of quarry work and for increasing productivity, were reliant on the best-in-class networking solutions.

Critical requirements

Nornickel has been working in the field of deposit digitalization for a long time. To manage transport and drilling rigs, monitor the main and auxiliary equipment, control the volume and quality of ore, the company has been using the Quarry automated control system (ACS) from **VIST group** (part of **Zyfra mining**).

Due to the hazardous nature of the work, malfunctions in the wireless network are

unacceptable, even in these harsh climatic conditions where the weather might affect a connection. For the real time operation of the Quarry automated control system, Nor Nickel needed a reliable solution for wireless broadband data transmission, including the one between moving objects.

Their supplier, the **Dateline Group of Companies** was given the task of finding the optimal solution for organizing wireless communications in the quarry. The connection integrator had to choose equipment that would meet high requirements for productivity, connection quality and, at the same time, high reliability. Dateline's engineers considered various competitors' products and solutions. However, they chose Infinet Wireless' solutions due to the smooth operation offered, even at extremely low temperatures, and Infinet's optimal algorithm for organizing communications between moving objects. Furthermore, Infinet offered full compliance with technical requirements, and the simplicity and ease of network deployment of the company's products .

Testing the water

Testing in the Arctic quarry was carried out using two sectors of the base stations of the InfiLINK R5000 family with integrated antennas ([Mmxtb](#)) operating in the 5 GHz frequency range. Two subscriber sets ([Lmntc](#)) with

connected antennas with a circular radiation pattern were installed on a moving object. [InfiMUX](#) switches were used at the base station and at the mobile object. The network was running on the Motorola Medium Independent Network Transport (MiNT) protocol in Time-division multiple access (TDMA) mode.

While testing and performing the preliminary setup of the equipment, some problems were encountered. For example, the frequency range, which had been initially agreed with the customer, was congested. In response, Infinet devices were rapidly transferred to free parts of the spectrum to allow for the installation to continue. Overall, despite the harsh conditions of the polar night, the entire installation process took only three hours.

Looking forward

As a result of the successful testing of the proposed algorithm and equipment, a standard solution using Infinet equipment will be developed for all quarries and mines where the Quarry automated control system (ACS) is deployed. The Dateline Group also plans to use Infinet solutions for mobile connections in other quarries, mines, highways and coastal zones.

VIST-Group's Project manager, Igor Osipov said:

“The result of combining the efforts of three companies will allow domestic manufacturers to reach new heights and meet the level of world leaders. Infinet is an open-minded, dynamic company, all of whose employees, from the directorate to warehouse workers, are imbued with the spirit of constructive problem solving. By unifying our efforts, we can further improve our products and create truly mobile connections systems. This is a huge niche, and the future main segment of the market.”

Requirements

- An optimal algorithm for ensuring the movement of moving objects from the coverage area of one base station to the coverage area of another without a break in connection;
- Flexibility of settings and transparency of management;
- Simplicity and convenience of network deployment;
- Work in severe climatic conditions;
- Qualified operational technical support.

Solutions

- R5000 family with integrated antennas (Mmxtb) operating in the 5 GHz frequency range.
- Two subscriber sets (Lmntc) with connected antennas with a circular radiation pattern were installed on a moving object.
- InfiMUX switches were used at the base station and at the mobile object.

The network was running the MINT protocol in TDMA mode.

Benefits

- Trouble-free operation of equipment at extremely low temperatures;

- Ability to make changes to settings in the field;
- Full compliance with customer specifications;
- The most successful algorithm that makes the connection stable;
- The ability to quickly eliminate technical hitches.

Nornickel is a Russian mining company, the world's largest producer of palladium, one of the leading producers of nickel, platinum and copper. The production units of the group are located in Russia, in the Norilsk industrial region, on the Kola Peninsula and in the Trans-Baikal Territory, as well as in Finland, Australia and South Africa.

VIST Group (part of Tsifra Group of Companies) is an international company in the field of development and implementation of information technologies for the mining industry and metallurgy.

Dateline Group of Companies is a system integrator in the field of connection, a provider of telecommunication systems and solutions. The group specializes in system engineering, installation and commissioning of wireless multiservice networks and data transmission channels. It is an integrator of Infinet equipment.