



RFID for Mining



Mining is a perfect example of an industry with a strong need for real-time location that had not been realized until the advent of Wi-Fi based active RFID systems. Mining operations around the world are beginning to realize the tremendous benefits of real-time tracking systems utilizing RFID technologies.

Here are just some of the benefits already being enjoyed today:

Safety: Real-time visibility of the accurate location and status of employees is paramount at all times, but especially in emergencies. RFID systems can remain operational during accidents, allowing you to know the precise location of personnel during an emergency, thus greatly reducing respondent response time. RFID can also be used to quickly locate emergency equipment such as respirators, first-aid kits and fire suppression equipment.

Asset Management: Manage materials, equipment and personnel more efficiently with automatic identification solutions. Accurately account for the status and location of all of your equipment, thus dramatically improving asset utilization, and streamlining the maintenance and repair process.

Collision Avoidance: NIOSH studies calculate that collisions between haulage equipment and pedestrian workers or other vehicles claim an average of five lives each year in surface and underground metal/nonmetal mining operations. Many more workers are severely injured. New developments in RFID systems can significantly reduce the risk of collisions, by providing automated alerts when problems appear likely.

Security: RFID can be used to limit workers from using unauthorized equipment as well as prevent access to unauthorized areas.

The solution combines WiFi-based active RFID product with an active RFID tag which can be integrated into a miners lamp hat or placed in a pocket. Location information is transmitted to the Omnitrol communications hub with a web-based tool which the mine manager views to centrally monitor miner safety and general mine operations. All such location information can be logged. FSN's solution -- which includes the tags plus its software platform and middleware-- supports features like zone monitoring and event-based alerts.



Because the solution is based on WiFi standards, it can leverage existing WiFi access points and hardware, eliminating the need for a mining enterprise to purchase a new network infrastructure to support

the tracking. Furthermore, once the software is in place, tags can be used beyond the tracking of miners to other physical assets and machinery. Vehicle and Personnel Safety Vehicle (or locomotive) and man tracking systems may be combined to avoid accidents both in underground- and surface-mining applications. A pedestrian detection system is coupled with the vehicle tracking to provide added safety features.

When a vehicle, fitted with a receiver, travels underground, the driver receives an audible and then visual signal if a person comes within a pre-programmable distance of the vehicle. The system could also alert the driver to any other potential hazards, for example, a sharp bend ahead or a dangerous area.

At an intersection, or crosscut, the system will detect if one vehicle moves in, and ensure that there is no other vehicle in the vicinity and then change the signal along the vehicle's route to green to create a free flow. If another vehicle approaches at the same time, the signals will flash red and alert both vehicles. Once all vehicles have moved on from the intersection, all the signals will be reset ready for the next occurrence.

The first stage of "man tracking" is installing receivers on the surface, close to the area where people descend underground. On every level there are receivers and, as people pass them, they are picked up by the systems and identified, and automatically time-stamped.

At any time, the systems can inform the control room who is at each level and at what time they passed

the receiver. All this information is saved on one central server in the control room and is compliant with existing systems.

In the case of an emergency, or if a WIFI Access Point goes down, one can access the location and view information regarding who was last identified in that area. The system identifies exactly where the individual was last seen as the antenna has a range of 30 m to 40 m, and once the person is out of that range, the person cannot be picked up until the person moves past another receiver.

Wi-Fi based active RFID system as the first phase of an equipment-tracking project inside an underground mine in Sudbury, Canada.

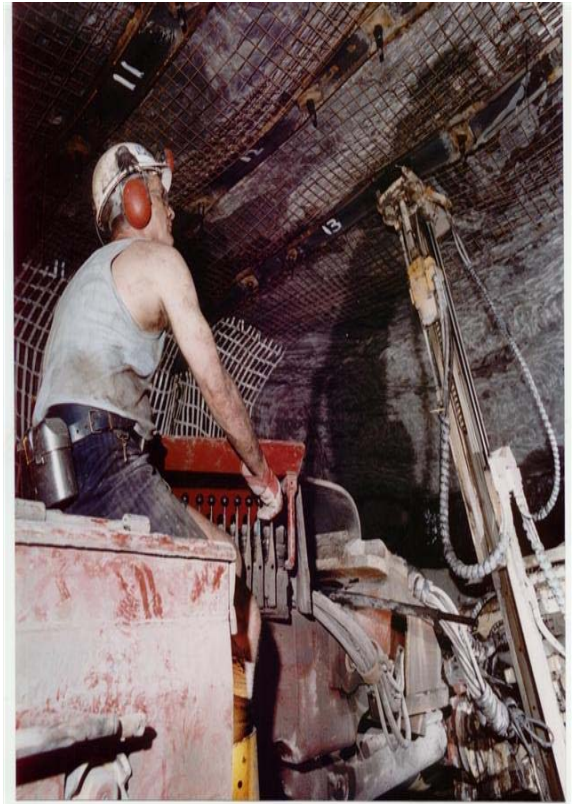
CVRD/Inco is an example of a mining operation using the mine's existing wireless infrastructure, along with RFID software for the tracking of items bearing Wi-Fi/RFID tags.

Equipment tracking

At CVRD/Inco's Sudbury mine, vehicles, containers, drills and other pieces of valuable mobile ore production equipment are constantly moving through large underground areas. Because the equipment does not necessarily follow a pre-defined track and is spread throughout the mine, it is difficult to locate particular assets that are needed at any given time. By attaching active RFID tags to each piece of equipment, Inco uses the mine's existing wireless access points to determine their locations both instantly and accurately.

CVRD/Inco will use the system to better track and understand mobile equipment use underground, and to help improve ore production. With the *Visibility System*, Inco will also be able to use the same infrastructure in the future for other location-based applications (such as supplies and energy management). The use of existing access points as readers enabled the system to be installed quickly and at a low total cost of ownership.

The system makes use of several "access points" installed at strategic locations in the mine. All workers are equipped with active RFID tags, which will be recognized and registered when they are within the reading range" of the access points. The maximum range is approximately 100 metres, which allows for guaranteed registrations at high-speeds. Even when 30 people are driving past in a bus, they will all be registered automatically.





At Malmberget, Sweden the newest haulage level is located 1000 metres beneath the surface. The haulage level is defined as one of ten separate zones in the software, allowing the master controlling office, to instantly display all personnel working here. In addition to displaying the whereabouts of personnel the system also brings other benefits, such as:

- A “work alone” feature allows workers to be given a deadline as of when they must have exited the mine. If they have not left before this deadline, an alarm will be triggered.
- Access control schedules allow alarms to be sent out when unauthorized workers reside in an undesired area.
- Automatic routing of alarms to the correct recipient, converts “alarm-time” into “rescue-time”.
- A map edit tool, allows for the placement of physical components on the same map background as the worker whereabouts are displayed. This provides instant visual indication whenever connections or main power supplies are lost.

The Omnitrol appliance with its built in middleware, available from FSN, turns asset location information received from multiple location data sources into real business solutions, delivering sophisticated mapping, rules-based alerting and reporting functions in a scalable, enterprise-proven software platform. With Omnitrol, developers and end users can apply their own rules and business logic to location information, truly leveraging their positioning data for efficient and intuitive applications in many different industries.

With Omnitrol, users can finally utilize location data to TRACK, ALERT, MANAGE and INTEGRATE multiple zones or locations from a single, enterprise-ready platform.

FALKEN Secure Networks(FSN)—Your partner for RFID automation

If you choose to pursue RFID implementation in your organization, here is the FALKEN Secure Networks commitment to you:

- FSN will provide solution architects to work with you to define system requirements for your particular installation. Multiple locations can be networked together for a central and real-time view and centralized management.
- FSN will do a RFID site survey to validate radio frequencies, tag types, system design and performance
- FSN will provide all necessary hardware and software to make the system work for you
- FSN will integrate the system with your existing enterprise management software
- FSN will provide documentation for the system, including operating procedures
- FSN will train your people
- FSN will provide warranty and continued system support

For RFID-enabled Document Tracking and Management, FALKEN Secure Networks (FSN) and partners bring together the right technologies to give you control over your files and make your office run more efficiently. Our automated and secure processes save time and labor, and prevent problems before they occur. With FSN ,you get the latest, non-proprietary secure RFID technology with the most powerful and flexible RFID file tracking software available.

Contact Us

FALKEN Secure Networks is a specialized System Integrator, RFID Solution Architect, and Value-Added Reseller with focused expertise in the RFID site survey, cost-effective design, and turn-key project implementation.

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