**Case Study**
IDAS™

# Rosebel Gold Mine, Suriname

## Remote Mining Operation Strikes Gold with IDAS™

A case study prepared by Icom America Inc.
Manufacturers of high-performance, award-winning radios for over 55 years.

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**Terrycomm** designs, integrates, and installs radio communications systems around the world, since 1994. This includes the system design and integration of equipment for Two-Way Radio, Microwave, WLAN, Wireless Voice and Data, System Propagation models and Site Surveys.

IAMGOLD ROSEBEL GOLD MINES N.V.

iDAS™ ICOM DIGITAL ADVANCED SYSTEM

### Featured Products:

- Icom F3161DS Portable Radio
- Icom F50V Portable Radio
- Icom F5061D Mobile Radio
- Icom FR5000 Repeater

Located in the mineral-rich Guiana Shield of Suriname, South America, the Rosebel Gold Mine lies approximately 85 miles south of Paramaribo, the country's capital city and main seaport. Abundant natural resources, including bauxite, oil, gold, iron ore and forestry, fuel the economy of Suriname, a former Dutch colony and the smallest independent country in South America with a population of approximately 500,000.

While gold was first discovered in the Rosebel area in 1879, commercial production did not start until 2004. Owned and operated by Canadian company IAMGOLD, the Rosebel Gold Mine is undergoing rapid growth and expansion. By the end of 2010, the cutting-edge operation included four pits, with exploration continuing on several additional sites. IAMGOLD produced nearly one million ounces of gold in 2010, and Rosebel contributed over 40% of that gold production on an attributable basis.

### Rapid Expansion Brings Unique Challenges

Rapid expansion produced a set of unique challenges for the Rosebel Gold Mine, including the need to keep up with the facility's growing communications requirements. "We very quickly outgrew our original radio system," explains Bill Thomas, IT Superintendent for IAMGOLD's Rosebel operation. "We have grown so large over the last 5 to 6 years that our system simply became too busy and crowded."

Two-way radio communications play an important role in ensuring the safety of Rosebel's 1,500 employees. By providing instant, direct communication among all mine employees, two-way radios help prevent accidents from occurring and should an incident arise, radios allow for a quick, coordinated response among multiple response units.

"IAMGOLD's No. 1 objective is to be mine-safe," Thomas says. "This was one of the major factors in our decision to move to a new radio system. We needed superior voice quality and the ability to communicate between different groups."

The company also needed to boost efficiency by giving employees access to instant voice and data communications over long distances and across challenging terrain.

The sheer scope of the operation — four open pits, the mill, additional exploratory areas, and a company-maintained road linking the mine back to the capital Paramaribo — creates significant management challenges. Factor in the area's remote rainforest surrounding, and the ability to communicate instantly with any employee becomes an invaluable tool for streamlining operations.

Finally, two-way radio communications help maintain a high level of security at the Rosebel Gold Mine, to protect the operation's equipment and final product — gold.

## 24/7 Communications in a Tough Environment

IAMGOLD approached Melbourne, Fla.-based Terrycomm, its longtime communications equipment provider, to investigate new radio solutions for its rapidly growing operation.

Reliability and coverage were two of the mine's primary requirements. The system needed to provide dependable, high-quality communications in a constantly evolving environment, where the shape and depth of the pits and the location of walls were constantly in flux. "It is a challenge to give simultaneous coverage to all the pits and get the handheld radios to communicate outside the deep pits," Thomas says." Coverage changes all the time."

The radio equipment had to be durable enough to withstand frequent blasting, heavy machinery, dust, vibration, high humidity and hot temperatures. The equipment also needed to hold up well to round-the-clock operations, where the equipment — including the radios — never rests.

"The operation runs 24/7; it never shuts down," explains Thomas. "We have a large fleet of radios in use around the clock. The repeaters themselves also have to be rugged and reliable to handle the large volume of traffic for the mines and mill."

## Icom System Proves Rugged and Reliable

Understanding Rosebel's need for a reliable, cost-effective solution, Terrycomm owner Donald Smith proposed an Icom IDAS two-way radio system that would provide full coverage across the mine's four  operating pits and remote exploratory areas, as well as along the road linking the Rosebel mine to Paramaribo.

Scalable to meet the operation's growing communication needs — including two additional soon-to-be-opened pits — yet much less costly than a conventional trunked system, the system would initially operate in analog/digital mixed mode until Rosebel was ready to make a full transition to digital communications. The system utilizes voting to provide superior audio across a wide geographical area. Repeaters are linked via IP to keep airwaves free for critical communications.

“Initially we wanted to upgrade to a full-blown trunking system, but it was too expensive,” Thomas says. “Instead, we decided to digitalize our system and break up our users into talk groups.”

“Everybody needs to be able to talk to everybody else, but they also need their own talk groups,” explains Terrycomm’s Smith. “A digital IDAS system offers many of the same benefits as a trunked system but at a much lower cost.”

To overcome coverage issues at the pits, Terrycomm placed a series of IDAS FR5000 repeaters in semi-permanent shelters that can move easily to adjust for changes in coverage as the pits grow and change shape. “The challenge was to get the handheld radios inside the pits to communicate outside the area. Coverage is changing all the time due to the changing size and shape of the pits,” Thomas explains. “This is especially difficult on a VHF system, since it changes in a matter of a few hundred feet.”

Harsh environmental conditions, including considerable rainfall, frequent blasts and explosions and large amounts of dust and water, posed another major communications challenge.  For example, in the mill area where gold ore is processed, a large amount of water is required for the refining process. Because the portable radios carried by mill workers are subjected to a significant level of moisture, Rosebel decided to use the rugged, waterproof F50V portable at the mill. The F50V’s waterproof construction can hold up to high moisture and frequent blasts and explosions, and its vibration alert is helpful in the operation’s high noise environment. And since the mine still operates in mixed mode, the F50V can be used alongside the mine’s F3161DS digital portable radios.

Finally, Rosebel needed continuous coverage along the 85-mile roadway linking the gold mine to Paramaribo. To allow truck drivers to stay in constant contact with the Rosebel operation while transporting equipment, supplies and personnel back to port, Terrycomm installed a series of IDAS digital repeaters along the remote roadway. IP connectivity links the digital repeaters back into the main system at the mine site.

## IDAS Increases Safety, Security and Efficiency

Terrycomm designed, integrated and tested the new IDAS system at its Melbourne operation before shipping the equipment to Suriname for implementation and final optimization. Rosebel radio technicians spent months training on the equipment prior to installation, learning to service, test and maintain the new system.

The system provided immediate relief to Rosebel's crowded, overused airwaves. Because IDAS equipment is backward compatible with older analog systems, Rosebel could integrate the new IDAS radios in phases to operate in mixed mode while gradually transitioning to a fully digital system. Digital IDAS technology also makes the most of available spectrum by utilizing highly efficient 6.25 kHz channel spacing.

According to Rosebel's Thomas, the new system provides dependable round-the-clock communications despite the mine's tough environmental conditions that include frequent dynamite blasting, heavy machinery, thick dust, constant vibration and the region's hot, humid weather. It has also improved operational efficiency by providing a reliable form of communications among all employees. "The more reliable the voice communications, the more efficiently our employees can do their jobs," Thomas says.

The new IDAS system also plays an important role in the mine's efforts to promote a safe working environment. "Safety was one of the major factors in moving to an IDAS system," Thomas says. "To provide a safe work environment, we need quality voice and the ability to communicate among the different groups."

Finally, the new system significantly increased the level of security at the Rosebel Gold Mine. The operation's security force relies on the new radios for instant, direct communication should an emergency or adverse situation arise, and the digital system along the road to Paramaribo provides truck drivers with a reliable form of communications with Rosebel officials should the driver encounter an emergency.

## Icom Solutions for Mining Industry

Rosebel selected the Icom IDAS F3161DS portable and F50V handheld radio for its employees working inside the pits and mill. Constructed with a durable aluminum die-cast chassis and polycarbonate casing, the F3161DS digital VHF transceiver meets IP55 requirements for dust protection and water jet resistance. Its 2000mAh Li-Ion battery pack provides up to 14 hours of operating time, ideal for Rosebel's round-the-clock operations. To ensure all workers can hear radio communications clearly, the F3161DS and F50V employ a BTL amplifier to increase audio output, and a built-in audio compander provides clear, low noise communications.

The waterproof F50V portable features a vibrate alert function with vibration powerful enough to be felt through heavy clothing. It offers dust and water protection equivalent to IP67 specifications and the built-in BTL amp delivers loud 700 mW audio output.

For inside its trucks and heavy equipment the company chose Icom's IDAS F5061 mobile radio, a rugged mobile resistant to shock and vibration. Like its companion F3161 portable, the F5061 offers advanced multi-mode operations and delivers clear

and loud audio. The F5061 series covers a wide frequency range and features 512 memory channel capacity with 128 zones for a variety of flexible channel groupings.

Because IDAS technology is backward compatible with older analog systems, Rosebel was able to introduce new digital equipment in phases for a gradual rollout. Additionally, by combining voting capability with IP connectivity, Rosebel was able to extend connectivity across a wide geographical area, providing the operation with a highly reliable and affordable alternative to a conventional trunking system.

Icom America offers a full line of IDAS equipment — mobiles, portables, base stations, repeaters and remote dispatch software — allowing mining companies to implement a fully integrated system customized to meet their individualized needs. Rugged and reliable, Icom equipment provides dependable communications despite mining's harsh environmental conditions.



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