# Partnership Creates State-of-the-Art Mine Monitoring

*Carroll Technologies Group and its subsidiaries, Carroll Engineering Co. and Delta Electric Inc., have partnered with Strictly Business Computer Systems to develop a Central Control Center to monitor multiple mines at one location.*
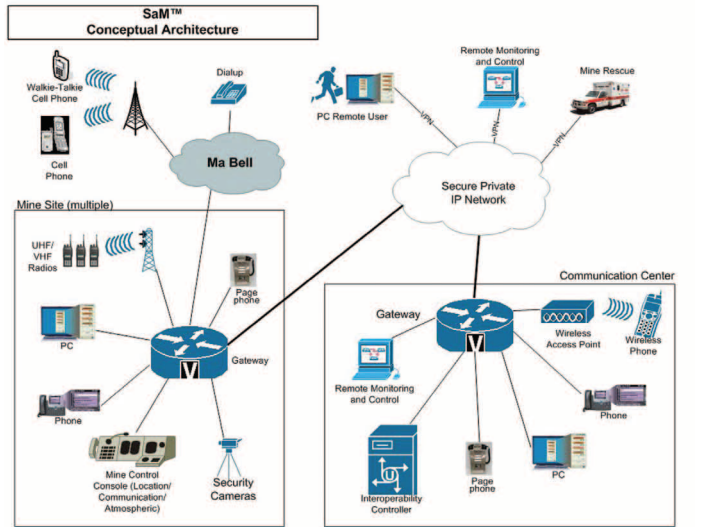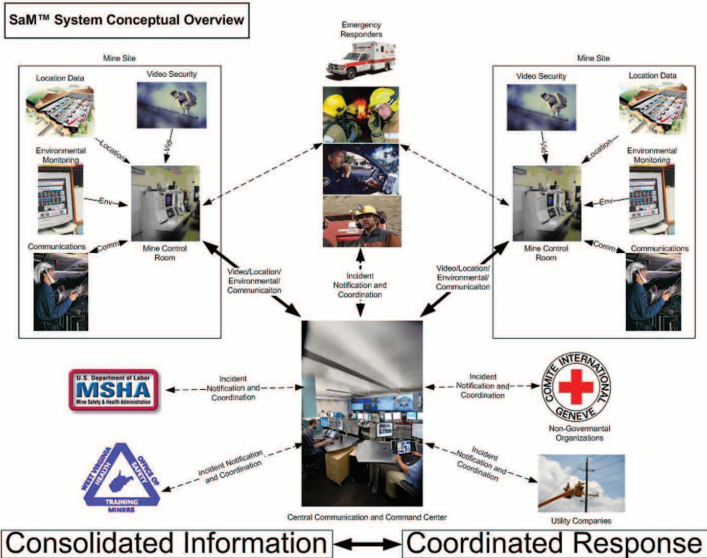


*A mobile communication option allows mine operators to establish remote command centers.*



*The new SaM Central Communications Center allows mine operators to talk across several platforms and monitor several mines from a single location.*

Building on the West Virginia Legislature's action earlier in the year, the Mine Improvement and Emergency Response (MINER) Act of 2006 called for a communication or control center to monitor communication and tracking/locating systems whenever one or more miners are underground. The control center operator must be a certified underground miner, who is knowledgeable about the mine's layout, communication network, warning systems, escape-ways, and emergency response plans (ERPs). The mines need to report accidents to the appropriate agencies within 15 minutes of the occurrence.

For the last two years, underground coal miners in the U.S. have experienced an indoctrination interpreting the new communications standards and implementing new technology, while trying to hold costs to a relatively reasonable level. When it came to monitoring systems, underground coal operators had already developed sophisticated atmospheric monitoring systems and they were retrieving and interpreting data from mining and conveying equipment. Since the MINER act was enacted, however, the proliferation of communications advancements for underground coal mines – leaky feeder, wireless nodes, RFID tagging systems, pagers, permissible handheld radios, etc. – has been incredible. What coal companies need now is a way to effectively mange all of these resources internally. This espe-



*The control room operator acts as an intermediary between the responsible person on site and first responders.*



*The SaM system uses IPICS software to convert all communications to IP.*

cially holds true in the case of an emergency.

Oftentimes, safety information and equipment data is widely dispersed. Complicating matters further, the mines operate independently even within the same company. Proper decision-making requires clear and concise information. The control center operator needs to see a complete picture.

When an incident does occur, the response is usually group-oriented and coordinating efforts externally can be difficult. Executing ERP's following Standard Operating Procedures, making the appropriate notifications, while attending to an injured miner or fighting a mine fire could easily overwhelm mine foremen. If a mine is isolated, it may have trouble locating resources off site. Emergency services and first responders may be using different radio channels or incompatible communication devices.

More underground mines operate in West Virginia than any other state. So, it should come as no surprise that these mines, local suppliers, and the West Virginia Office of Miners Health Safety and Training (OMHST) have led the effort in testing and developing systems to meet the state and federal communication requirements.

Carroll Technologies Group and Strictly Business Comput-



## Delta Electric & Carroll Engineering's Advanced Tracking Systems Safeguard 15,000+ Miners Daily

Exclusive State-Of-The-Art System Links Mine Operations with Emergency Responders

**Company Overview:** Carroll Engineering and Delta Electric, the two operating companies of The Carroll Technologies Group have been servicing the mining industry in North America for over 30 years. From their early history in the coalfields of West Virginia, they have become the largest and best electronic services group in the U.S.A. providing over 800 mines with advanced technology communications, employee and equipment tracking systems, atmospheric monitoring systems, and a broad range of other safety, electric and electronic products.

**Commitment to Miner Safety:** First to market with a common control room concept known as Safety and Monitoring System (SaM) developed in conjunction with Strictly Business Computer Systems in Huntington, WV. This, along with our Miner Care 24/7 support operation brings a significant contribution to mine safety.

**Featured Products:** Mine Central Communications System, Matrix tracking Systems, Varis Communication Systems, Safety and Monitoring System (SaM) and Pyott-Boone Atmospheric Monitoring systems.

**West Virginia Approval:** Yes, received in 2009.

**Product Summary:** Integrated command and control room (SaM) that ties together voice and data communications, location tracking of personnel and equipment and atmospheric monitoring systems. The SaM architecture provides a fully redundant set of command posts capable of acting independently in the event of an emergency.

**Key Features:** Real-time miner location; real-time environmental monitoring; video security feeds; integrated voice communications; image and data command and control displays in centralized command center; automated notification to emergency responders to cell phones and pagers; monitoring of multiple mines from a single location.

**Miners Protected:** 15,000 miners tracked and communicating underground every day using our systems.

**West Virginia Mines Served:** Delta Electric has installed tracking and communication systems in 67 mines in the state. Carroll Engineering has 84 outside of West Virginia.

**Total Mines Served in USA for all Delta Electric & Carroll Engineering Products:** 800+

**Jobs Created in West Virginia:** Delta has 40 direct employees and 20 subcontractor employees. Outside of WV Carroll Engineering has 70 direct employees.

**Total Locations:** 4 total in WV for Delta Electric and Carroll Engineering. 11 total in the USA between the two companies.

**Total Product Lines Supplied to Mining Companies:** Hundreds of products supplied with over 70 partner companies.

**West Virginia's role in leading miner safety:** "Our state has been the first and most aggressive in developing standards and processes for insuring safe operating conditions for miners. Excellent partnership between state government and industry has led the way to the establishment of better safety conditions which has ultimately been the model for the Federal Government's Miner Act."
 — Mike Hastings,
CEO Carroll Technologies Group

**Web Sites:**
http://www.carrolltechnologiesgroup.com
http://www.deltaelectricwv.com
http://carrollengineeringco.com

Carroll Engineering /
Delta Electric Company Factsheet
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er Systems partner to develop a Central Control Room concept in the mining industry, with the support and encouragement from the Office of WV 3rd District U.S. Congressman Nick J. Rahall. The Central Control Room has the ability to network all of the communications systems and compile all of the data flowing from the mine and present it in a user-friendly interface for the control room operator. International Resource Partners (IRP), a WV-based coal operator with four underground mines, agreed to test the prototype under demonstration agreement the OMHST. While the mine admits to a steep learning curve and an extended period of debugging, they believe the system is nothing short of phenomenal. OMHST is finalizing its evaluation of the demonstration and is looking at approving similar deployments.

Carroll Technologies Group along with SBSC spent two years or more developing technology geared specifically toward the mines with a couple of partners, Carroll Technologies, a West Virginia firm that owns Delta Electric and Carroll Engineering, and Cisco Systems, along with its IP Interoperability and Collaboration Systems (IPICS) software. IPICS is a, scalable, comprehensive solution for communications interoperability. It allows push-to-talk communications on radio handsets, networks, laptop and PC clients, telephones and mobile phones, improving response times and resource collaboration. By sending radio traffic over an IP network, IPICS cost-effectively lets public safety personnel exchange information when they are using incompatible radios. It can facilitate coordinated, incident management response for emergencies and day-to-day operations across multiple agencies, jurisdictions, or departments.

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