**Underground Communication and Tagging/Tracking**

**what are the options?**

Most everyone will agree that there is no such thing as too much safety or too many precautions to protect working miners. But, bring up the topic of what type of underground communication is best and one will receive as many different opinions as there are people in the room. Everybody knows and understands the need for these devices: to allow communication with miner’s underground- in both working and event activities. These systems allow enhanced communication and increased productivity through minimizing man hours between workforces. Now that the systems are required by law- which one is the best investment for a company? The system must be effective and applicable to mine conditions, easy to maintain and expand and serve its purpose- allow communication. The most popular and effective systems and optimal return on investment options include:

- **Becker – Varis Leaky Feeder system** uses proven Smart Com amplifier and its 30mhz bandwidth to provide high speed TCP/IP data transfer through Leaky feeder cable. It utilizes industry standard cable modem technology to provide wired and wireless Ethernet applications such as computer networking, IP cameras, teleoperation and VoIP in underground hotspots. Varis’ Smart Com Leaky Feeder uses the latest technology to deliver 16 simultaneous noise-free voice radio channels and a 54Mbps downstream, 40.96 Mbps upstream Ethernet connection. Standard Ethernet equipment can now be hooked up to an inexpensive and simple to install and maintain network. Smart Com has reliability built-in with local and remote diagnostics and is backed by an unlimited two-year warranty and is available in three versions to fit your needs.\(^1\)

- **Fiber Optic cable** given its multiplicity with unlimited IP voice, video, tagging and tracking, monitoring and control- remotely; which makes this tool very diverse and effective. By utilizing fiber optic cable, there is less maintenance, multiple monitoring locations, analytical trouble-shooting, enhanced safety factors and prevent loss of down time. This system must be paired with an additional wireless two-way communication system to meet West Virginia law.

- **Active Controls** wireless two-way communications for underground mine operations is referred to as ActiveMine. ActiveMine’s 5.8 GHz wireless nodes (also known as ‘routers’ or ‘access points’) communicate with one another without hardwire connection. This is in contrast to other communications systems which require a backbone wire or cable. In addition to 2.4GHz wireless two-way voice communications and tracking, the ActiveMine network supports data services, including streaming video, to monitor mine activities from the surface and improve operating efficiency. It uses open-standard technology that is fully compatible with most other mine communications and tracking technologies, including previously installed systems. This makes it possible for mines to add wireless while leveraging hardwire networks already in place.\(^2\)

- **Traditional mine phones** and monitoring over multiple pairs of copper wires, while a staple among the mining industry they provide limited opportunities for communications, monitoring or controls.

Mine operators can enhance the ability to locate a miner or equipment, post accident, through the tagging and tracking software system.

- **Matrix offers METS (Miner & Equipment Tracking System)** which is an electronic safety and tracking system designed specifically for mining environments to track underground personnel and equipment. The system tracks tags which are “glued” to a hard hat or equipment through their assigned RFID number by each reader located along the mine entryways or passages. The METS system offers a Staging Monitor and area to allow miners to “Tag In” as they enter the mine, it has a dual-screen workstation to monitor travel underground through the reader zones in a map display. Each miner is issued their own RFID tag, which is entered into the database system with the miners personal information and a photo. The METS system is different than most other tracking systems, in the fact that it has four antenna options to allow for more long range coverage through Ethernet support with power and data over a single cable.\(^3\)

- **Becker-Varis** offers their Smart Tag with long range RFID (Radio Frequency Identification) tagging technology that reliably tracks the location and movement of resources, including personnel, vehicles and goods. The system consists of RFID tags, networked RFID readers and a PC/Server running Smart Tag software. The readers connect to an Ethernet network using twisted pair, fiber optics or Varis’ Smart Com Leaky Feeder. Smart Tag’s web based software distribution enables multiple user access and provides a real-time view of resource location network wide.\(^1\)

For more information on communication and tagging and tracking options, please request a visit from either Carroll Engineering Co. or Delta Electric, Inc. through websites or by phone. Both companies professional teams offer experienced and educated design and planning along with award winning sales and service teams to assist mines 24/7, in cases of emergency or installation assistance. The goal is to make investments in the safety of miners count!

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3. Matrix information is reprinted and available at www.matrixdginc.com