

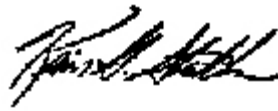
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FROM:

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SUBJECT:

Guidance for Compliance with Post-Accident Two-Way
Communications and Electronic Tracking Requirements of the
Mine Improvement and New Emergency Response Act (MINER
Act)

Scope

This program policy letter (PPL) is intended for Mine Safety and Health Administration (MSHA) personnel, equipment manufacturers, repair facilities, underground coal mine operators and independent contractors, miners' representatives, and other interested parties.

Purpose

This PPL is a general statement of policy that provides mine operators guidance in implementing: (1) alternatives to fully wireless post-accident two-way communication between underground and surface personnel and (2) electronic tracking systems, both of which are required by the MINER Act. The two-way communication alternatives (or "partially wireless" systems) include infrastructure underground to provide untethered communications with miners.

Policy

The following guidance is provided to assist mine operators in developing post-accident two-way communication between underground and surface personnel and electronic tracking for their Emergency Response Plans (ERPs), as required by the MINER Act. The MINER Act requires, by June 15, 2009, a plan be submitted that provides for a post-accident communication system between underground personnel and surface personnel via a wireless two-way medium and an electronic tracking system that permits surface personnel to determine the location of any persons trapped underground. If these provisions cannot be adopted, the MINER Act requires that ERPs must set forth an alternative means of compliance that approximates, “as closely as possible, the degree of functional utility and safety protection provided by the wireless two-way medium and tracking system” referenced.

With respect to tracking, because electronic systems currently are available and MSHA approved, new ERPs and revisions to existing ERPs should provide for electronic tracking of persons underground.

However, because fully wireless communications technology is not sufficiently developed at this time to permit use throughout the industry, this guidance addresses acceptable alternatives to fully wireless communication systems. New ERPs and revisions to existing ERPs should provide for alternatives to fully wireless communication systems.

This guidance represents MSHA’s current thinking with respect to two-way communication and electronic tracking for use in mine emergencies. It does not create or confer any rights for any person nor does it operate to bind mine operators or any other members of the public. Mine operators can use an alternative approach or system to provide two-way communication or electronic tracking, if the approach or system satisfies the requirements of applicable statutes and regulations. If you are a mine operator, miners’ representative, or miner and want to discuss another approach or system, you may contact the MSHA District Manager for the area in which the mine is located. Other interested parties may contact the individuals identified in this PPL. References to the District Manager in this PPL refer to the Agency’s existing consultative process for approving mine plans, as opposed to the process for enforcement decisions related to citations.

Two-Way Communication System

In accordance with Section 2 of the MINER Act, until fully wireless systems are available, operators must set forth in their Emergency Response Plans the reasons that they are proposing alternative systems, that is, that wireless systems are not available, and provide an alternative that approximates, as closely as possible, the degree of

functional utility and safety protection provided by a wireless two-way communications system. While operators and District Managers must consider mine-specific circumstances in determining appropriate two-way communications systems, this guidance outlines the features MSHA believes would best approximate the functional utility and safety protections of a fully wireless system, given the limitations of current technology. As noted, operators and others may propose other approaches or systems, and the District Manager will exercise his discretion in evaluating them. Communications systems that are already in use may need to be updated to comply with the MINER Act requirements to approximate the utility and safety protections of a fully wireless system.

1. General Considerations - An alternative to a fully wireless communications system used to meet the requirements of the MINER Act for post-accident communication either can be a system used for day-to-day operations or a stored system used in the event of an accident. Examples of currently available technologies that may be capable of best approximating a fully wireless communications system include, but are not limited to, leaky feeder, wireless or wired node-based systems, and medium frequency systems. Any alternative system generally should:
 - a. Have an untethered device that miners can use to communicate with the surface. The untethered device should be readily accessible to each group of miners working or traveling together and to any individual miner working or traveling alone.
 - b. Provide communication in the form of two-way voice and/or two-way text messages. If used, pre-programmed text messages should be capable of providing information to the surface necessary to determine the status of miners and the conditions in the mine, as well as providing the necessary emergency response information to miners.
 - c. Provide an audible, visual, and/or vibrating alarm that is activated by an incoming signal. The alarm should be distinguishable from the surrounding environment.
 - d. Be capable of sending an emergency message to each of the untethered devices.
 - e. Be installed to prevent interference with blasting circuits and other electrical systems.
2. Coverage Area
 - a. The system must provide coverage throughout each working section in a mine.
 - b. The system also generally should provide continuous coverage along the escapeways and a coverage zone both inby and outby strategic areas of the mine. Strategic areas are those areas where miners are normally required to work or likely to congregate in an emergency and can include

belt drives and transfer points, power centers, loading points, refuge alternatives, SCSR caches and other areas identified by the District Manager. While a coverage zone of 200 feet inby and 200 feet outby strategic areas normally should be adequate, the District Manager may require longer or shorter distances given circumstances specific to the mine.

- c. The District Manager may approve alternative coverage areas to those areas identified in 2(b), such as adjacent entries, for reasons such as radio frequency interference or other factors that may reduce the coverage area at the identified strategic areas.
 - d. Miners should follow an established check-in/check-out procedure or an equivalent procedure when assigned to work in bleeders or other remote areas of the mine that are not provided with communications coverage.
 - e. Communications for refuge alternatives must be provided as required under 30 C.F.R. §75.1600-3.
3. Permissibility – The communication system must be approved by MSHA to comply with 30 C.F.R. part 23 and applicable policies.
4. Standby Power for Underground Components and Devices
- a. Stationary components (infrastructure) generally should be equipped with a standby power source capable of providing sufficient power to facilitate evacuation and rescue in the event the line power fails or is cut off. In many mining situations, at least 24 hours of standby power based on a 5% transmit time, 5% receive time, and 90% idle time duty cycle (denoted as 5/5/90) should be adequate, but mine-specific conditions may warrant more or less standby power capability. The system should display whether it is operating on-line or with standby power and give an indication of the state of charge of standby power.
 - b. Untethered devices, such as hand-held radios, generally should provide sufficient power to facilitate evacuation and rescue following an accident. In many mining situations, at least 4 hours of operation in addition to the normal shift duration (12-hour minimum total duration) based on a 5/5/90 duty cycle should be adequate, but mine-specific conditions may warrant more or less capability. This total operation time can be achieved via spare portable devices or cached batteries if the device is approved for battery replacement in the hazardous area.
5. Surface Considerations
- a. The surface portion of the communication system generally should include a line-powered surface component with a standby power source to ensure continued operation in the event the line power is interrupted.

- b. The communication system should be configured to allow communication between underground personnel and the communication facility required under 30 C.F.R. § 75.1600-1 where a person who is always on duty when miners are underground can receive incoming messages and respond immediately in the event of an emergency. The person should be trained in the operation of the communication system and knowledgeable of the mine's Emergency Response Plan.
 - c. The communication system can be monitored from a remote site. However, the mine site must have full system capability.
- 6. Survivability
 - a. The post-accident communication system generally should provide redundant signal pathways to the surface component. The system should display pathway interruptions and system malfunctions.
 - i. Redundancy means that the system can maintain communications with the surface when a single pathway is disrupted. Disruption can include major events in an entry or component failure.
 - ii. Redundancy can be achieved by multiple systems installed in multiple entries, or one system with multiple pathways to the surface; provided that a failure in one system or pathway does not affect the other system or pathway.
 - b. If system components must be installed in areas vulnerable to damage (such as in front of seals), protection against forces that could cause damage should be provided.
- 7. Maintenance
 - a. The equipment manufacturer generally should provide a maintenance schedule and checklist to the mine operator.
 - b. The mine operator should:
 - i. Establish and follow a procedure to provide communications during system or component failures in the event that an accident occurs before the failure can be corrected. This procedure should include restoring at least 24 hours of standby power for the infrastructure.
 - ii. Examine the infrastructure and verify on a weekly basis that it is maintained in proper operation condition. In the event of any failure that results in the loss of communication, repairs should be started immediately and the system restored to operating condition. A record of the examination should be kept and made available to an authorized representative of the Secretary and miners.
 - iii. Examine the untethered devices on a daily basis to verify that they are maintained in proper operating condition.
 - iv. Follow the manufacturer's maintenance recommendations.

Electronic Tracking System

Approved electronic tracking systems are available. While operators and District Managers must consider mine-specific circumstances in determining an appropriate electronic tracking system, this guidance outlines features MSHA believes would provide the protection contemplated in the MINER Act in many underground coal mining environments. As noted, operators and others may propose alternative approaches or systems, and the District Manager will exercise his discretion in evaluating them.

1. General Considerations - Plans must be submitted that provide for determining the location of persons underground using an electronic tracking system pursuant to 30 U.S.C. § 876(b)(2)(F)(ii).
2. Performance
 - a. While the required capabilities of a particular tracking system will depend on mine-specific circumstances, an effective electronic tracking system generally should be capable of:
 - i. Determining the location of miners on a working section to within 200 feet.
 - ii. Determining the location of miners in escapeways at intervals not exceeding 2000 feet.
 - iii. Determining the location of miners within 200 feet of strategic locations. Strategic areas are those areas where miners are normally required to work or likely to congregate in an emergency and can include belt drives and transfer points, power centers, loading points, refuge alternatives, SCSR caches and other areas identified by the District Manager.
 - iv. Determining the location of miners in belt entries at intervals not exceeding 4000 feet or at each manned belt drive if the distance between the drives is less than 4000 feet.
 - v. Determining direction of travel at key junctions in escapeways.
 - vi. Determining the identity of miners within 200 feet of refuge alternatives.
 - b. Electronic tracking systems generally should be installed to prevent interference with blasting circuits and other electrical systems.
3. Permissibility – The tracking system must be approved by MSHA under 30 C.F.R. part 23 and applicable policies.
4. Standby Power for Underground Components

- a. Stationary components (infrastructure) should be capable of tracking persons underground during evacuation and rescue efforts, even upon loss of mine power. In many circumstances, the capacity to provide a minimum of 24 hours of continuous tracking operation after a power loss should be sufficient. The system should display whether it is operating on-line or with standby power and give an indication of the state of charge of standby power.
 - b. An individually-worn/carried tracking device (e.g., a tag) generally should provide a low power warning. To facilitate evacuation and rescue efforts, the individually-worn/carried tracking device should provide at least 4 hours of operation in addition to the normal shift duration (12-hour total minimum duration).
5. Capacity - Tracking system components (readers) must be capable of tracking the maximum number of persons, including visitors, expected to be in a coverage area.
6. Scanning rate - In order to provide timely and relevant information, the tracking system generally should be capable of updating (refreshing) location data at least every 60 seconds.
7. Surface Considerations
 - a. The surface portion of the tracking system should be equipped with standby power to ensure continuous operation in the event the line power is interrupted.
 - b. The tracking system should be configured to allow monitoring the location of miners underground from the communication facility required under 30 C.F.R. § 75.1600-1 where a person is always on duty when miners are underground and should include the capability to display the location of all miners underground. The person on duty on the surface should be trained in the operation of the tracking system.
 - c. The tracking system can be monitored from a remote site. However the mine site must have full system capability.
 - d. The tracking system interface should display the last known location of a miner when the tracking device is not communicating with the system.
 - e. Each miner should be uniquely identified.
 - f. Location data should be associated with a time stamp.
 - g. Location data should be stored for two weeks so that it will be available for evacuation and rescue of persons underground, as well as for accident investigations.
8. Survivability

- a. If system components must be installed in areas vulnerable to damage (such as in front of seals), protection against forces that could cause damage should be provided. For example, protection could be provided by installing enclosures in recessed areas, around corners, or other areas that reduce potential for damage, or routing and protecting cables such that potential for damage is minimized.
 - b. The MINER Act does not explicitly require redundancy for tracking systems, however, pursuant to Section 2 of the MINER Act, tracking systems must be “calculated to remain serviceable in a post-accident setting.” As system redundancy is one method for improving the likelihood of tracking capability following an accident, consideration should be given to the use of redundant signal pathways to the surface component as a means to better ensure survival of electronic tracking systems following an accident.
 - i. Redundancy means that the system can maintain communications with the surface when a single pathway is disrupted. Disruption can include major events in an entry or component failure.
 - ii. Redundancy can be achieved by multiple systems installed in multiple entries, or one system with multiple pathways to the surface; provided that a failure in one system or pathway does not affect the other system or pathway.
 - c. Data storage should not be impacted by interruption of the data link between underground and surface components.
 - d. The system should display pathway interruptions and system malfunctions.
9. Maintenance
- a. The equipment manufacturer generally should provide a maintenance schedule and checklist to the mine operator.
 - b. The mine operator generally should:
 - i. Establish and follow a procedure to provide tracking during system or component failures in the event that an accident occurs before the failure can be corrected. This procedure should include restoring at least 24 hours of standby power for the infrastructure.
 - ii. Examine the infrastructure and verify on a weekly basis that it is maintained in proper operating condition. In the event of any failure that affects the tracking capability of the system, repairs should be started immediately and the system restored to operating condition. A record of the examination should be kept and made available to an authorized representative of the Secretary and miners.
 - iii. Examine on a daily basis the devices worn by miners to verify that they are maintained in proper operating condition.

- iv. Follow the manufacturer's maintenance recommendations.

Background

The MINER Act of 2006 included the following requirement for communications and tracking systems:

Not later than 3 years after the date of enactment of the Mine Improvement and New Emergency Response Act of 2006, a[n emergency response] plan shall, to be approved, provide for post accident communication between underground and surface personnel via a wireless two-way medium, and provide for an electronic tracking system permitting surface personnel to determine the location of any persons trapped underground or set forth within the plan the reasons such provisions can not be adopted. Where such plan sets forth the reasons such provisions can not be adopted, the plan shall also set forth the operator's alternative means of compliance. Such alternative shall approximate, as closely as possible, the degree of functional utility and safety protection provided by the wireless two-way medium and tracking system referred to in this subpart.

In addition, the MINER Act requires:

Consistent with available technology and with the physical constraints, if any, of the mine, the plan shall provide for above ground personnel to determine the current, or immediately pre-accident, location of all underground personnel. Any system so utilized shall be functional, reliable, and calculated to remain serviceable in a post-accident setting.

As technological advances are made and become available, MSHA will update this guidance, and District Managers will review existing Emergency Response Plans to consider the manner in which intervening advances in electronic tracking systems may enhance miners' ability to evacuate or otherwise survive in an emergency.

Authority

Section 316 of the Federal Mine Safety and Health Act of 1977, as amended, 30 U.S.C. § 876; 30 C.F.R. part 23 and § 75.1600.

Filing Instructions

This program policy letter should be filed behind the tab marked "Program Policy Letters" at the back of Volume II of the Program Policy Manual.

Internet Availability

This program policy letter may be viewed on the World Wide Web by accessing the MSHA home page (<http://www.msha.gov>) and choosing "Compliance Info" and "Program Policy Letters." A list of MSHA-approved two-way communications systems and a list of MSHA-approved electronic tracking systems may be found at <http://www.msha.gov/techsupp/PEDLocating/MSHAApprovedPEDproducts.pdf>.

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