Effective Communication

Training for Incident Command Centers and Mine Rescue Teams

Colorado School of Mines
Mine Safety and Health Program

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OVERVIEW

Communication is a critical component of any emergency response and the success of that response is dependent upon **effective** communication. It is important that personnel involved in emergency responses have a thorough understanding of how to communicate, and the factors present during emergencies that can impact the communication process. *Effective Communication for ICC and Mine Rescue Teams* was developed to provide information to mine rescue teams and personnel staffing an incident command center about basic communication processes and how communication is affected by emergency situations.

This training presents a simple model for communication, discusses roadblocks to communication, defines active listening, and describes factors that occur during emergencies that affect communication. Several activities designed to demonstrate various communication principles are included. This training presentation concludes with two activities involving a mine rescue scenario.

The Emergency Management Institute IS 242, *Effective Communication*, and NIOSH Publication 99-157, *The Emergency Communication Triangle*, served as the basis for this training.

Purpose

The purpose of this training presentation is to provide basic information about effective communication and how it is affected during a mine emergency. Individuals serving in an incident command center or on a mine rescue team are required to communicate throughout the duration of the emergency response to ensure the safety of the team and the successful rescue of victims.

Target Audience

This training has been designed for incident command center personnel and mine rescue teams. However, it can easily be adapted to emergency response personnel involved with other types of emergencies. This training can be integrated with annual classroom training or it can be given as a stand-alone training session.

Training Topics

This training includes the following topics:

- Basics of Communication
  - This topic presents a simple model for communicating, roadblocks to effective listening, and tips for active listening.

- Communication and Emergencies
  - Factors occurring during emergencies that affect communication, and tips for improving communication are discussed. Additionally, the communication triangle as it applies to a mine emergency is presented.

- Communication Equipment
  - Communication equipment used during mine emergencies is presented, as well as a back-up system should voice/auditory equipment fail.

Performance Objectives

There are three objectives of this training, which include:

- Enhancing communication and interpersonal skills by increasing knowledge of basic communication processes and the impact of emergency situations on these processes
- Applying effective communication principles during mine emergencies
- Promoting the effective use of communication equipment during mine emergencies

File Format

This training presentation was developed as a PowerPoint® file with Microsoft® Office 2007 using a Microsoft® Windows Vista® operating system. The file formats for this presentation include Microsoft® Office 2007 and Microsoft® Office 1997-2003.

TRAINING GUIDE

This section presents each slide of the training presentation and includes discussion points and activities that should be completed to reinforce the content of the slide. This training was designed as a single 60 to 90-minute presentation.

EFFECTIVE COMMUNICATION
for
ICC and Mine Rescue Teams

Discussion Points

- What role does communication play during a mine emergency?

- Why is it important to communicate effectively during mine emergencies?

Objectives

- Increase knowledge of basic communication processes and the impact of emergency situations on these processes
- Apply effective communication principles during mine emergencies

Discussion Points

- What processes do people use to communicate and how are these processes affected by emergency situations?

- How can principles of effective communication be applied during mine emergencies?

Basics of Communication

Discussion Points

- This section presents basic information on communication, including a simple communication model.

Communication

- The average worker spends 50 percent of his or her time communicating.
- Business success is 85 percent dependent on effective communication and interpersonal skills.
- 45 percent of time spent communicating is listening.
- Writing represents 9 percent of communication time.
- One-fourth of all workplace mistakes are the result of poor communication.
- A remarkable 75 percent of communication is nonverbal.

Discussion Points

- Communicating is often taken for granted because it is a daily activity.

- Some facts about communicating:

    o The average worker spends 50 percent of his or her time communicating.

    o Business success is 85 percent dependent on effective communication and interpersonal skills.

    o 45 percent of time spent communicating is listening.

    o Writing represents 9 percent of communication time.

    o One-fourth of all workplace mistakes are the result of poor communication.

    o A remarkable 75 percent of communication is nonverbal.

- Examples of non-verbal communication:

    - Head-nods, facial expressions (smiles, frowns, etc.), bodily contact, eye movements, laughter, body posture, hand/arm gestures and many other actions

    - Glazed or down turned eyes and fidgeting indicating boredom or disinterest (1)

Activity

Think of a recent example at work in which you were involved in a miscommunication and answer the following questions:

> Why did the miscommunication occur?
>
> What impact did it have?

If you had a chance to do it over again, what specifically would you do differently?

Definitions

- Communication
  - Systematic and continuous process of telling, listening and understanding

- Effective Communication
  - Occurs when the receiver understands the message in the same sense as the sender wishes to convey it
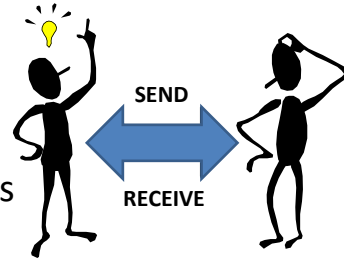
Discussion Points

- What is communication?

- What is the difference between communication and effective communication?

- What do you know when you communicate that you are communicating effectively?

Activity:

Ask the class to provide personal examples of both ineffective and effective communication.

Send – Receive Model

- The sender sends a message.
- The receiver gets the message and personalizes it.
- The receiver, in turn, sends feedback and thus becomes a sender.
- The original sender now becomes a receiver and reacts to the feedback.
- Generally, a new communication sequence is then initiated.

SEND

RECEIVE

Discussion Points

- The basic components of communication are sending and receiving messages.

- Sending and receiving are not simple actions. How you deliver information and how you listen to others can dramatically alter how others respond to your message.

- Communication is complex, but it can be analyzed and refined. (1)

Activity

Ask the class how this model applies to an emergency situation.

Answer: Immediately before, during, and immediately after an emergency, emergency and response personnel must respond quickly. Time to communicate is limited, and often a specific message that must result in practical action must be relayed to a large group. A very simple model that sends the message efficiently and elicits the desired response will be most useful.

Ask the class if sending or receiving the message is more important.

Answer: In the send-receive model, receiving or <u>listening</u> is as critical as sending the message because, without listening, it is impossible to personalize and respond to the message.

Hearing vs Listening

- Hearing is the special sense by which noises and tones are received as stimuli. Hearing is a sensory experience that gathers sound waves indiscriminately.
- Listening is a voluntary activity and includes interpreting or processing that sound.
- Active listening involves listening with empathy.

We can hear something and choose not to listen!

Discussion Points

- Hearing – continuous process that occurs as an involuntary response initiated when sound pressure waves are collected by our outer ears and then impact on the eardrum. Our ears are always working, even when we are sleeping.

- Listening is a voluntary activity and includes interpreting or processing what is heard. What is heard has meaning!

- Active listening involves listening with empathy. (1)

- Empathy is defined as the action of understanding, being aware of, being sensitive to, and vicariously experiencing the feelings, thoughts, and experience of another of either the past or present without having the feelings, thoughts, and experience fully communicated in an objectively explicit manner. (*http://www.merriam-webster.com/dictionary/empathy*)

Active (Empathic) Listening

- *Decide to listen and concentrate* on the speaker.
- Use your imagination and *enter the speaker's situation*.
- *Observe* the speaker's vocal inflection, enthusiasm or lack of it, and style of delivery.
- *Listen without interruption.*
- Use paraphrasing or clarifying questions to *confirm* that you received the intended message.
- *Provide feedback* to the speaker

Discussion Points

- When you listen empathically, you don't just hear words; you hear thoughts, beliefs and feelings.

- Empathic listening is highly active and requires hard work.

- Steps to improve your listening skills:

  1. The first step is to <u>decide to listen and concentrate</u> on the speaker.

  2. Then, use your imagination and <u>enter the speaker's situation</u>. Concentrate and try to imagine his or her frame of reference and point of view.

  3. <u>Observe</u> the speaker's vocal inflection, enthusiasm or lack of it, and style of delivery. These are essential components of the message. If you are speaking face-to-face, pay attention to the speaker's facial expressions and other nonverbal cues for more insight into the message.

  4. <u>Listen without interruption</u>. Note key phrases or use word associations to remember the speaker's content.

5. Use paraphrasing or clarifying questions to <u>confirm</u> that you received the intended message. Check your perceptions of how the speaker is feeling to put the text of the message in emotional context.

6. Finally, <u>provide feedback</u> to the speaker. (1)

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External Roadblocks to Effective Listening

- Noise
- Uncomfortable temperature
- Uncomfortable seating
- Inappropriate location
- Inadequate personal space
  - 1.5 to 4 feet   friends
  - 4.0 to 12.0 feet   social and business contacts
  - 12 feet or more   strangers in public

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Discussion Points

- Roadblocks to effective listening can be external or internal.

- External roadblocks can include distracters such as:

  o noise

  o uncomfortable temperature or seating

  o an inappropriate location

  Be aware of external roadblocks and offset them if possible. (1)

Activity:

Ask attendees for examples of external roadblocks they have experienced. Some examples include:

- Crying baby in a restaurant

- TV or music while someone is talking to you

- Interruption in reception of signal – television/streaming video or audio

- Annoying habits of speaker (pacing, repeatedly saying "um")

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Internal Roadblocks to Effective Listening

- Emotional interference
- Defensiveness
- Hearing only facts and not feelings
- Not seeking clarification
- Hearing what is expected instead of what is said
- Stereotyping
- Automatic dismissal - "We've never done it that way before."
- Resistance to change
- The halo effect - the tendency for something to be influenced by a loosely associated factor

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Discussion Points

- Internal roadblocks include a variety of conditions or reactions within the speaker or audience, such as:

  o Emotional interference

  o Defensiveness

  o Hearing only facts and not feelings

  o Not seeking clarification

  o Hearing what is expected instead of what is said

  o Stereotyping

  o Automatic dismissal - "We've never done it that way before."

  o Resistance to change

  o The halo effect: the tendency for something to be influenced by a loosely associated factor – Examples of halo effect: a person's accent; a past experience with a person; gum chewing. (1)

Activity:

Ask students to provide examples of internal roadblocks that could occur during a mine emergency?

Some examples include:

- o Knowing potential victims
- o Differences in acceptable levels of risk

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Tips for Active Listening

- Make eye contact
- Adjust your body posture
- Give verbal or nonverbal acknowledgment
- Clear your mind
- Avoid distracting behaviors

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Discussion Points

- Additional techniques to help ensure active listening:

  o **Make eye contact.** Eye contact increases the chances of "getting" the message and demonstrates interest and attention. When listening to someone on the phone, try <u>not</u> to look at things that will take attention away from the speaker.

  o **Adjust your body posture.** Posture – facing the speaker and slightly leaning in – suggests that you are paying attention and helps you to stay tuned in. When on the phone, position yourself so that you're comfortable but not so relaxed that you lose the ability to attend to the speaker.

  o **Give verbal or nonverbal acknowledgment.** Acknowledging the speaker helps involve you in the communication process and shows you are paying attention.

  o **Clear your mind.** Clear your mind of your own thoughts to avoid wandering mentally.

- o **Avoid distracting behaviors.** Distracting behaviors – texting, answering your cell phone, playing with a pencil, drumming your fingers, grimacing, jingling change in your pocket, or others – may take away from your ability to listen and distract the speaker. (1)

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Barriers or Roadblocks
to Communication

- Any factor that leads to miscommunication
- Any factor which influences the communication process in such a way that the receiver does not understand the message in the way the sender was trying to communicate it

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Discussion Points

- Barriers to communication:

    o Any factor that leads to miscommunication

    o Any factor which influences the communication process in such a way that the receiver does not understand the message in the way the sender was trying to communicate it

    o A number of barriers or roadblocks can limit the effectiveness of communication. (1)

Activity:

What factors can you think of that may lead to miscommunication of important information?

What factors may cause the receiver to misunderstand the message?

Communication Variables

- Differences between the sender and receiver
  - Attitudes, knowledge levels, communication skills, social systems, sensory channel
- Differences in communication styles
- Differences in previous experiences
- Cultural differences

Discussion Points

- There are numerous variables involved in the communication process

  o **Differences between the sender and receiver** affect the odds of successful communication.

    - **Attitudes.** How different are the attitudes between the sender and the receiver?
    - **Information levels.** Is the sender or receiver significantly more informed than the other?
    - **Communication skills.** The greater the difference in the sender's and the receiver's communication skills, the less likely it is that communication will be successful.
    - **Social systems** provide a context or background for interpreting messages. If the sender and receiver do not share a similar social system, successful communication is more of a challenge.

- **Sensory channel.** The five senses (i.e., seeing, hearing, touching, tasting, and smelling) are the basic channels of communication. Using more channels increases the chance that communication will be successful. Does the person attending a meeting via a conference call have the same communication advantages as on-site attendees?

  o **Differences in communication styles** often create an extra challenge. General behavior patterns of our personalities form our personal communication styles. These patterns can be productive, nonproductive, or even counterproductive, and the interplay of these styles affects the communication's effectiveness.

  Imagine a relatively shy gentleman, in a public place, who needs to locate ice for an injured wrist. Would it be more challenging for him to communicate his need to four boisterous people playing video games or to someone quietly reading a book to a child? While he may be successful with either group, the difference in communication styles will pose more of a problem with the first group.

  o **Differences in previous experiences** create a filter through which we hear the world. Inference, judgment, and generalization can become as significant as facts. The statement, "There is a dog in the room," will be heard differently by someone who has been bitten than by someone with a well-loved pet.

  o **Cultural differences** impact how a message is sent as well as the manner in which a message is received. To be effective, you need to be sensitive to cultural differences without stereotyping. (1)

Examples – China

- Do not use large hand movements. The Chinese do not speak with their hands. Your movements may be distracting to your host.

- Personal contact must be avoided at all cost. It is highly inappropriate for a man to touch a woman in public.

- Do not point when speaking. To point do not use your index finger, use an open palm.

- Bowing or nodding is the common greeting; however, you may be offered a handshake. Wait for the Chinese to offer their hand first.

Examples – Saudi Arabia

- The left hand is considered unclean and reserved for hygiene; avoid gestures with the left hand. Do not point at another person and do not eat with the left hand.

- Try not to cross your legs when sitting. Never show the bottom of your feet.

- The "thumbs up" gesture is offensive.

- Communications occur at a slow pace. Do not feel obligated to speak during periods of silence. "Yes" usually means "possibly".

Examples – France

- The French frequently interrupt each other, as the argument is a form of entertainment.

- The French often complain that North Americans lecture rather than converse.

- Be sensitive to the volume of your voice. Americans are known to offend everyone in a restaurant, meeting, or on the street with their loud voices and braying laughter.

- Eye contact is frequent and intense, and can often be intimidating to North Americans. *(http://www.cyborlink.com/besite/)*

Benefits of Effective Communication

- Reduce confusion
- Increase confidence in decisions
- Stop incorrect rumors
- Improve likelihood of success

Discussion Points

- Effective communication requires time and effort.
- Benefits of effective communication:
  - Reduce confusion
  - Increase confidence in decisions
  - Stop incorrect rumors
  - Improve likelihood of success (1)

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Communication and Emergencies

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Discussion Points

- This section addresses how communication is affected during emergencies.

Emergency vs Daily Communications

- Emergency information is important – matter of life and death
- Timeliness is essential
- Warnings require response
- More barriers to communication (stress, change of routine, sleep deprivation)
- Partner to ensure all messages are consistent

Discussion Points

- Communications during emergencies differ from communications during day-to-day communications. These differences are described briefly in the points that follow.

  o **Emergency information is important**

  Studies show that during an emergency, information is as critically important to people as food or water. Not only can accurate information mean the difference between life and death, it can provide reassurance that response and recovery are truly underway.

  o **Timeliness is essential**

  If official answers are not available, rumor and speculation quickly fill the information vacuum. Then, not only must you disseminate correct information, but you also need to counter the misinformation that circulated.

To use media in a timely fashion, learn local media news cycles and deadlines. For example, if news occurs at 4:00 p.m., you can most likely get it on the radio immediately, on television in time for the 5:00 p.m. report, and into the next morning's edition of the local paper.

- o **Warnings require response**

   Emergency warnings differ from other kinds of messages because their purpose is to elicit a specific response from the public – rather than merely raise awareness or provide knowledge.

- o **Barriers to communication**

   It is more difficult for people to hear messages during an emergency. Stress, change of routine, and lack of sleep all can be hurdles to overcome when communicating during emergencies.

- o **Partner to ensure that all messages are consistent**

   There may be many responders participating in the emergency. It is important that information is shared and made public so that it "speaks with one voice" and that everyone provides the same information. (1)

Roadblocks during Emergencies

- Insufficient time
- Stress/Emotional factors (fear, nervousness, etc.)
- Assumption that receiver already knows some information
- Distortion of messages
- Distractions
- Sleep deprivation / fatigue
- Change in routine

Discussion Points

- Examples of roadblocks during emergencies:

  o Insufficient time to understand and digest the message

  o Sender and receiver may not have enough time to convey and receive message

  o Information being given is more that what the receiver can handle for the time given

  o Distortion of messages for the purpose of impressing the receiver

  o Leaving gaps in messages assuming that the receiver already knows some information

  o Stress or emotional factors

  o Sleep deprivation/fatigue

  o Change in routine (1)

Roadblocks during Mine Rescues

- PPE (full face respirator)
- Communication devices resulting in poor transmission of messages

- Using communication methods that require repeating messages
- Exposure to mine gases may impact ability to reason (victims)

Discussion Points

- Roadblocks during mine rescues can include:

  o PPE that may muffle your voice or cause difficulty in speaking or hearing

  o Communication devices that may have poor reception in area or areas of use

  o If information has to be passed through several sources the message may be changed.

  o Any exposure to harmful materials can affect the sender's ability to communicate; also, victim may become unresponsive without proper protection. (1)

Communications Paths

- Mine rescue team members
- Victims and mine rescue team
- FAB and mine rescue team
- ICC and mine rescue team
- ICC and family members
- ICC and public safety officials
- ICC and MSHA
- ICC and media
- ICC and public

Discussion Points

- Several communication paths exist during mine emergencies:

  - Mine rescue team members
  - Victims and mine rescue team
  - FAB and mine rescue team
  - ICC and mine rescue team
  - ICC and family members
  - ICC and public safety officials
  - ICC and MSHA
  - ICC and media
  - ICC and public
  - ICC members

Activity:

Can you think of any other communication paths?

- ICC and State/Local Government Officials
- ICC and Federal Government Officials
- ICC and Mine Management

Communication Practices During Emergencies

- Present the information in sequence; present the reason for the message, the supporting information, and the conclusion.
- Word the message precisely, making every word count.
- Avoid jargon, codes, and acronyms.
- Use common names for all personnel and facilities.
- Omit unnecessary details.
- Speak in synchrony with other related authorities.
- Keep messages consistent across various media.

MAKE SURE YOUR MESSAGE IS CLEAR

Discussion Points

- Make sure your message is clear.
- When communicating in an emergency, you should always:
  - Present the information in sequence:
    - Reason for the message
    - Supporting information
    - Conclusion
  - Word the message precisely, making every word count.
  - Avoid jargon, codes, and acronyms.
  - Use common names for all personnel and facilities.
  - Omit unnecessary details.
  - Speak in sync with other related authorities.
  - Keep messages consistent across various media. (2)

Activity:

Think of an example of communication that occurs during a mine rescue emergency. How can it be improved using one of these characteristics?

Example: When reporting gas readings, state reason for communication, give location first, and then the gas readings in the same order each time the gas readings are reported.
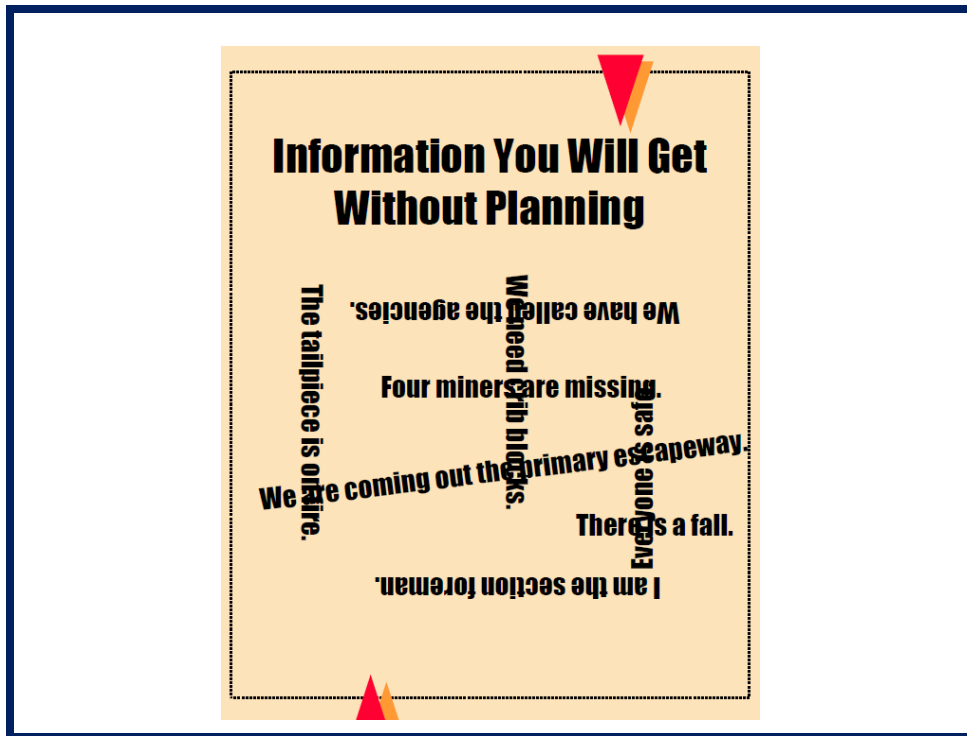
Discussion Points

- Plan how communications will be handled during an emergency.

  As an emergency unfolds everyone has questions, and detailed information is necessary for the best response. Remember, too, that everyone is under stress that further compounds the problem. This figure shows the kind of emergency communications that could happen if not prepared.

- How can we plan for better communications?

  We could list all the things we need to say when an emergency happens, but research has shown that most people cannot remember long lists of items. (The average person can remember about 7 distinct items on a list and this is one reason why telephone numbers are 7 digits.) However, we are better at remembering things if we have something to help cue the material.

- Strategies for better communications:
  - Use checklists
  - Establish procedures
  - Training
  - Field exercises
  - Establish who is responsible for communications at different levels. (2)

Activity:

Take out a sheet of paper and pencil. I will say a list of ten numbers. After I list the numbers, see how many you can remember and write them down. 6, 12, 4, 15, 18, 2, 7, 9, 18, 20.

Now I will say seven numbers. How many can you now remember?   5, 10, 16, 2, 6, 7, 11.

Now I am going to say 7 objects. How many can you remember? Cat, bicycle, book, mouse, car, pencil, apple.

Compare the results between 10 and 7 numbers, and between 7 numbers and 7 items.

Information Needed During Early Stages of an Emergency

- What is happening
- Is anyone in danger?
- How big is the problem?
- Who reported the problem?
- Where is the problem?
- Has a response started?
- What resources are on-scene?
- Who is responding so far?
- Is everyone's location known?

Discussion Points

- During the early stages of an emergency situation, there is the lack of information. However, everyone wants information.

- There are many questions that need to be answered. A few examples of questions that should be asked and answered during an emergency include:
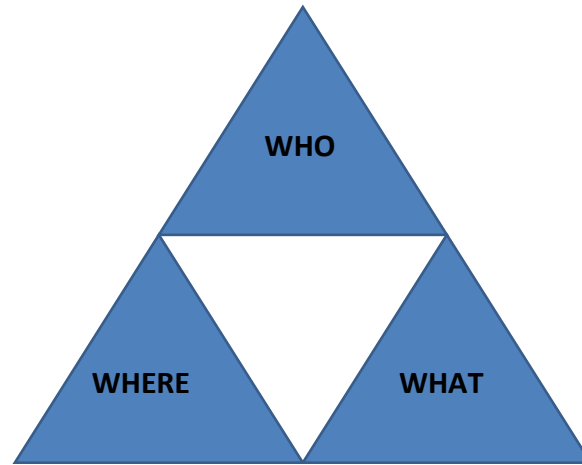
  o What is happening?

  o Is anyone in danger?

  o How big is the problem?

  o Who reported the problem?

  o Where is the problem?

  o Has a response started?

  o What resources are on-scene?

  o Who is responding so far?

  o Is everyone's location known? (2)

Communication Triangle

Discussion Points

- The communication triangle is structured like the fire triangle. (The sides of that triangle are fuel, oxygen, and heat.) A similar triangle can also be used for emergency warning communications.

  o **WHO –** Who is reporting the emergency or receiving a warning

    This is important because the person receiving the information may react differently based on who gives them the information.

    Example: Fire reported by a mine rescue team member versus an inexperienced miner. The communication person will probably react faster when receiving the information from the mine rescue team member as compared to the inexperienced miner, and may spend time getting more information from the inexperienced miner or verifying the situation with another miner.

- **WHERE –** Share or ask the location of the problem and be specific

  This may seem like common sense, but it doesn't always happen during emergencies.

  Example: The communications person at a large underground mine received a call from a miner who said, "There's a fire on the belt!" The person making the call then hung up so he could start fighting the fire. The communications person only knew that there was a fire somewhere on the mine's more than 7 miles of belt.

  Example: Three mine fires forced the evacuation through smoke of more than 60 miners. Of the 48 miners interviewed about their experiences, only two knew where the fire was located as they were escaping, even though this information was known by the dispatcher or the person who discovered the fire. As a result, miners had to make decisions about escape routes without knowing the locations of the fires. This lack of knowledge also increased the stress during the situation because they couldn't determine how far they would have to walk to find fresh air.

- **WHAT –** Tell exactly what is happening at the scene

  Again, this may seem like common sense, but it does not always happen in an emergency.

  Example: During a serious mine fire, a warning message was given for everyone on the section to evacuate. Miners who had been near the phone when the call came in went to gather the others on their crew. One of these miners, a shuttle car operator, ducked under the check curtain and yelled to the miner operator saying, "Come on down to the mantrip. We're going out." Since the belt was down and it was close to quitting time, the miner operator and his helper thought they were just leaving the section a little early. They completed their normal end of shift routine

(backing the continuous miner out of the cut, setting jacks, tightening check curtains, and disconnecting the power) before reporting to the mantrip. Thus, valuable time was lost.

Communication Triangle

WHO

EVENT   MINERS

RESPONSE

WHERE   WHAT

Discussion Points

- **Details**

  o **MINERS**

    Is anyone hurt?

    Has everyone been accounted for?

    When and where was a missing person last seen?

    If miners may be in trouble, make them the highest priority by reporting what you know.

  o **EVENT**

    Will this problem require a first aid kit or an ambulance?

    Should we call for mine rescue teams or just a couple of fire extinguishers?

    Report exactly what you are facing.

- ○ **RESPONSE**

  What's been done so far? (There is no need to duplicate efforts.)

  How many people are on the scene?

  What equipment is on scene?

Example: During an emergency at one mine that had battery powered haulage equipment, the responders couldn't take scoops and other equipment out of service long enough to allow the batteries to be fully charged. They called a neighboring mine and asked for help in the form of additional scoops, batteries, and chargers. The neighbor said, "Of course, we'll send over whatever you need." In response, the neighboring mine then sent all the extra cap lamp batteries that they had on hand. Somewhere in communicating what equipment was needed, the request for scoops, batteries, and chargers was translated into cap lamp batteries. Thus, valuable time was lost as the needed items had to be requested again. (2)

MRT Communication Systems

Discussion Points

- As Team travels beyond the fresh air base, communication plays an increasingly important role in your exploration work.
- It is extremely important that teams develop an effective method of communicating among themselves and with the fresh air base.

Communications among MRT Members

- Talking among team members usually kept to minimum when using breathing apparatus
- Utilize system of signals to communicate among team members
- Use horn or rope
- Signals most commonly used are:
  - One signal   Stop
  - Two signals   Advance (move toward captain)
  - Three signals   Retreat (move toward No. 5 (last) person)
  - Four signals   Distress or emergency
- Signaling done by team captain and the last team member - each should return others signal before anyone on the team moves.
- Practice signaling

Discussion Points

- During exploration, talking among team members is generally kept to a minimum.

- Team members use a system of signals to communicate among themselves.

- Signals are sent by means of some sort of signaling device, such as a horn.

- Signals most commonly used are:

  One signal   Stop
  Two signals   Advance (move toward captain)
  Three signals   Retreat (move toward No. 5 (last) person)
  Four signals   Distress or emergency

- Standard practice for each to return the others signal before anyone on the team moves.

- Ensures that the first and last person will have heard the signal, and that the entire team is ready to respond to the signal.

- Be sure to use these signals as much as possible during your training sessions. If you practice them often enough, your response to them during an emergency will become almost automatic. (3)

Communication Between MRT & FAB

- Team must stay in contact with FAB
- Use either sound or battery-powered communication equipment
- Last team member
  - wears the equipment
  - responsible for relaying information to and from the FAB
- Use existing underground phones, if operational

Discussion Points

- As the team advances, it's important to stay in close contact with the fresh air base to report team's progress and to receive further instructions.

- To communicate with the fresh air base, use either sound or battery-powered communication equipment.

- One team member, usually the No. 5 or last person, wears the equipment, and is responsible for sending information to the fresh air base and relaying instructions from the fresh air base to the team.

- Existing underground phones, if operational, may also be used to communicate with the fresh air base. (3)

> # Backup Communication System between MRT and FAB
>
> - Use cable from portable system to communicate with FAB (must meet requirements in 30 CFR Part 49.6)
> - Cable attendant at the FAB
>   - Unwinding the communication line as team progresses.
>   - Monitors the line to make sure it's not getting snagged or caught.
>   - If voice contact lost, receives and sends signals to and from the team by a system of pulls or tugs on the communication line.

Discussion Points

- If communication system fails, the cable from the system can be used to communicate with the fresh air base as long as the cable meets the requirements set forth in Title 30, Code of Federal Regulations 30 CFR Part 49.6.

- At the fresh air base, an attendant should be in charge of unwinding the communication line as the team travel. This person is usually known as the line or cable attendant and monitors the line to make sure it's not getting snagged or caught.

- If the team loses voice contact with the fresh air base, it will be the attendant's job to receive and send signals to and from the team by a system of pulls or tugs on the communication line. (3)

Note: Some teams are instructed to return to the fresh air base immediately if their communication system fails. If this is standard practice for your team, be sure to mention it. On the return trip, or if the team is unable to return immediately, they may still need to make sure of a backup communication system.

Signals with Backup Communication System

- Signals
  - One pull or tug   Stop
  - Two pulls or tugs   Advance
  - Three pulls or tugs   Retreat
  - Four pulls or tugs   Emergency or Distress
- If team is stopped for extended period, FAB should signal one long pull about every five minutes to check out the team's condition. The team should then acknowledge that they are okay by returning the signal.

Discussion Points

- Signals:

  One pull or tug   Stop

  Two pulls or tugs   Advance

  Three pulls or tugs   Retreat

  Four pulls or tugs   Emergency or Distress

- If team is stopped at one location for an extended period, or if it is performing a specific task, such as building a bulkhead or clearing a roadway, it's common practice for the fresh air base to signal one long pull about every five minutes to check out the team's condition. The team should then acknowledge that they are okay by returning the signal. (3)

Communication Process with Backup System

- Captain's signals to the team should also be relayed back to the fresh air base.
  - The Captain signals the last team member
  - Last team member relays the captain's signals to the FAB and then waits for the FAB to acknowledge that it has received the signal
  - Last team member then sends response back to the captain
  - This communication is done before the team executes the instructions dictated by the captain's signal

Discussion Points

- When using the cable to communicate with the fresh air base, the captain's signals to the team should also be relayed back to the fresh air base.

- The last team member relays the captain's signals to the fresh air base by repeating them on the cable and then waits for the fresh air base to acknowledge that it has received the signal before sounding a response to the captain's signal. All this is done before the team executes the instructions dictated by the signal. (3)

Problems with Backup Communication System

- Difficult to signal if MRT has advanced any great distance from the FAB.
- Cable may get caught on corners.
- Falls, debris, and other obstructions may also snag the line and limit its use.

Discussion Points

- Using the communication cable as a signaling device can present problems.

  o It becomes more difficult to signal with the cable if the team has advanced any great distance from the fresh air base.

  o The cable has a tendency to get caught when the team goes around corners.

  o Falls, debris, and other obstructions may also snag the line and limit its use. (3)

Activity:

What other problems may one encounter using this system?

Mine Rescue Exercise

Discussion Points

Exercise 1:

This exercise involves exploring an underground mine following the report of a fire. During the evacuation of personnel, you discover a loader on fire in B-Right. Using the communication triangle model, communicate with the base the "Who," "What," "Where," "Event," "Miners," and "Response." The evaluation consists of determining the hazards present, how the evaluation would proceed, and what conditions should be evaluated and reported, and the procedures that should be followed in resealing the area of the mine affected by the mine fire. If time is limited, then the exercise can be shortened by reducing the number of tasks the recovery team must accomplish.

Exercise 2:

This exercise involves two-person teams, with one person attempting through verbal communication only to guide the second person to a location within the Edgar Mine where a victim would be found. Both persons have maps of the Edgar Mine, but the person receiving

the information has a map that is only an outline of the mine with air doors marked. No other information is provided on this map. At the end of this exercise, the person receiving the directions should mark the victim location on their map. This location is then compared to the location on the map of the person giving the directions.

Discuss with the participants why this task was difficult/easy to complete.

Exercise 1

Communication Triangle

A fire has been reported in the Edgar Mine, an underground mine located in Idaho Springs, Colorado. At the time of the fire, 12 miners were in the mine, 4 were in B-Right. During the evacuation of 10 miners, you discover a loader has caught fire in B-Right.

Using the communication triangle model, communicate with the Fresh Air Base the "Who," "What," "Where," "Event," "Miners," and "Response." The evaluation should answer the following questions:

1. Who reported the fire?

   Who was involved in the incident?

   Who was affected by the incident?

2. Where did the fire occur?

3. What is happening?

4. What hazards are present?

5. How would the evaluation proceed?

6. What conditions should be evaluated and reported?

7. What procedures should be followed in resealing the area of the mine affected by the mine fire?

Exercise 2

Mine Rescue Communication Exercise

Finding Injured Victim in the Edgar Mine

Purpose: To demonstrate how interpretation of communication can differ for individuals

Directions: You will be divided into teams of two. Each of you will be given a map; one map will have a location of a victim and other important information. The other map will be left blank. Using your verbal communication skills, explain to your partner with the blank map how to reach the victim. For this scenario, entry to the mine via the Miami Tunnel is prohibited. Using the questions below, try and navigate your partner to the victim. An additional sheet of notes will assist you in determining the specifics related to the problem.

Description: Jack Jackson is a miner at the Edgar Silver Mine with 8 years of underground mining experience. Jack started his shift at 6 a.m. and was instructed by the mine manager to free up a seized air cylinder on an ore chute located in the B-right area of the mine. Jack was also instructed to contact the surface no later than 10 a.m. Mr. Jackson failed to make contact with the surface at the designated time. All attempts to establish communication with Jack have failed. Shortly after 10 a.m. another miner Mr. Weston Smith entered the mine to attempt to locate Mr. Jackson and was forced to evacuate the mine because of hydrogen sulfide (H_2S) alarms on his gas monitor. H_2S gas is not completely uncommon to the Edgar Silver Mine but is normally contained to inactive sections of the mine.

Observation Questions:

1. What permanent installations could help you to identify your location and the possible location of the victim?

2. Have any items been located that might aid in identifying the probable location and duration of time the victim has been underground?

3. Has any equipment been located?

4. Are there any indications as to what the victim might have been doing?

5. What are the conditions of the air doors?

6. What is the operational status of the main ventilation fan?

Notes

Ventilation notes: The condition and position of the air doors are displayed on the map. The main ventilation fan is off. Ventilation is consistent with the air flow following the normal circuit. Caved impassable areas are not affecting ventilation, only personnel access.

Raise/Stope notes: All stopes/raises in active/inactive areas of the mine are fully functional unless noted otherwise. All stopes/raises are equipped with identical ore chutes, air cylinders and man ways.

N. 2600 Ft.

E. 5000 Ft. E. 5200 Ft. E. 5400 Ft. E. 5600 Ft. E. 5800 Ft. E. 6000 Ft.

Edgar Mine Drift

Drift Blocked West of This Point

Bureau of Mines Stope

Raise
VICTIM

Incline

N. 2400 Ft.

Closed Air Door

Air Door

Reservoir

Transformer Cutout

C-Right Spur

Closed Air Door

C-Right Straight

Track Storage

Supply Cut Out

Closed Air Door
Closed Air Door

C-Right

Closed Air Door

B-Right 1st (Spur)

B-Right 2nd

Air Door AJAR

Rock Bolt Storage

Closed Air Door

B-Right 1st

Closed Air Door

B-Right Straight

N. 2200 Ft.

C-Left 1st

C-Left

Air Door

USGS Rock

Miami Tunnel

B-Right

Raise

B-Right Sub-Level 50 Feet Above Main Level

B-Left First

Air Door

N. 2000 Ft.

Wire Room

Air Door

Bator Stope

C-Left 2nd

B-Left Second

Stope

B-Left

Shop

Air Door

N. 1800 Ft.

Galena Drift

Air Door

Air Door A-Left

Raise

Bodin Drift

Air Door

Air Door

Maze

Miami Tunnel

Ventilation Raise & Secondary Escape (200 Feet Upward to Surface) (Up Cast Ventilation)

Raise

Spencer Cross Cut

Shelter Cut Out

N. 1600 Ft.

Orica Drift

Spencer Cross Cut

CAVED IMPASSABLE

Miami Tunnel

Dam

N. 1400 Ft.

Orico Blast Chamber

Refuge Chamber

Muck Bay

Air Door

Compressors
1200 Ft. Lamp Room

LEGEND
Raise
Air Door
Fire Extinguisher
First Aid Station
Phone
Radio

Army Adit

Muck Bay

Army By Pass Drift

Office

Shop

Dry

Sunburst Drift

CAVED IMPASSABLE

SCALE (FEET)

EDGAR-MINE Dec. 05-10-09

0   50   100   200

Drill Shed

Fuel & Oil Storage

ICC

N. 1000 Ft.

Colorado School of Mines

EDGAR EXPERIMENTAL MINE

Idaho Springs, Colorado

N. 2600 Ft.

E. 5000 Ft.
E. 5200 Ft.
E. 5400 Ft.
E. 5600 Ft.
E. 5800 Ft.
E. 6000 Ft.

Raise

Air Door

N. 2400 Ft.

Air Door

Air Door

Air Door

N. 2200 Ft.

Air Door

Air Door

Air Door

Air Door

Air Door

Raise

N. 2000 Ft.

Air Door

Bator Stope

Air Door

Stope

Air Door

Air Door

Raise

N. 1800 Ft.

Air Door

Air Door

Air Door

Maze

Air Door

Raise

N. 1600 Ft.

Dam

N. 1400 Ft.

Air Door

LEGEND

Raise

Air Door

Fire Extinguisher

First Aid Station

Phone

Radio

Compressors

N. 1200 Ft.
Lamp Room

Office

Dry

Shop

N

EDGAR-MINE DWG. 06-10-09

SCALE (FEET)

0   50   100   200

N. 1000 Ft.

Drill Shed

Fuel & Oil Storage

ICC

Discussion

HANDOUT

This handout was obtained from Reference 1 and reformatted for generic use.

Nonverbal Cues

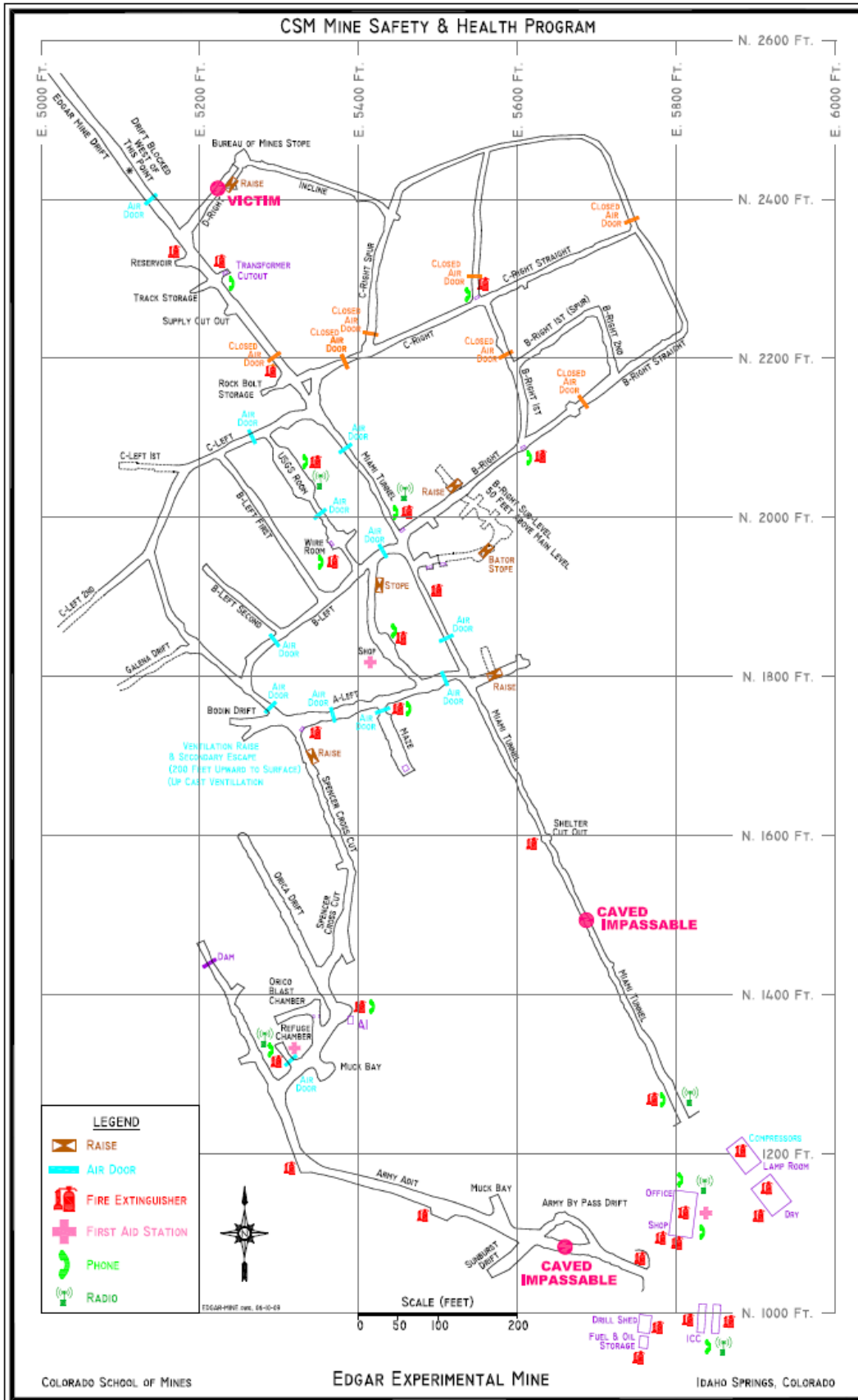## SPEAKER'S NONVERBAL CUES
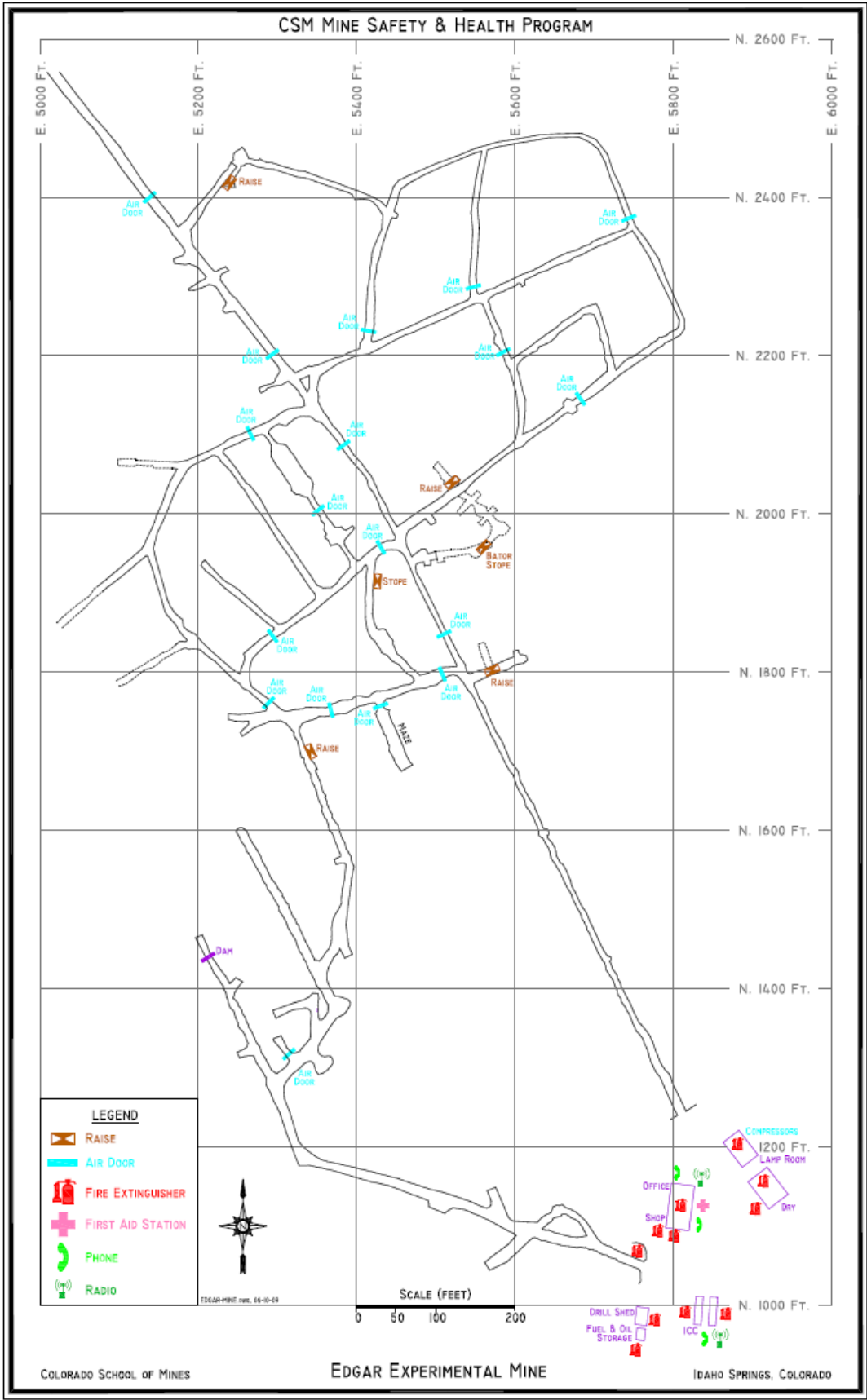
Your nonverbal language reflects your attitudes, emotions, state of mind, and related messages. Nonverbal cues include:

- Vocal intonation:
  - ✦ Pitch, tone, inflection, volume
  - ✦ Rhythm, timing
- Silence
- Personal space
- Styles of dress:
  - ✦ Uniform (conveys authority, power)
  - ✦ Casual vs. dressy

- Body language:
  - ✦ Posture, body position
  - ✦ Head movements
  - ✦ Eye movement, eye contact
  - ✦ Facial expressions
  - ✦ Fidgeting, yawning
  - ✦ Touching

LISTENER'S NONVERBAL CUES

Boredom	▪ Slouching in one's seat
	▪ Yawning
	▪ Staring out the window
	▪ Lack of eye contact
	▪ Neutral expression
	▪ Fidgeting
	▪ Closed posture
	▪ Drifting attention
	▪ Slowness to respond
	▪ Neutral or "slurred" speech
Frustration	▪ Rubbing forehead with hand
	▪ Tense, worried expression
	▪ Throwing hands up in the air
Agreement, Enthusiasm	▪ Leaning toward the speaker
	▪ Making eye contact
	▪ Touching the speaker's arm or hand
	▪ Nodding head
	▪ Relaxed, open posture
	▪ Smiling or laughing
	▪ Faster speech
	▪ Higher pitch
Disagreement, Confusion	▪ Frowning
	▪ Shaking head
	▪ Leaning back or away
	▪ Pursing lips
	▪ Tightened jaw and closed posture
	▪ Staring elsewhere
	▪ Shallow, rapid breathing
	▪ Limited facial expression and hand gestures
	▪ Slower speech
	▪ Lower pitch
Evaluation	▪ Chewing on eyeglass frames
	▪ Wearing a thoughtful, intense expression

CSM Mine Safety & Health Program

EDGAR EXPERIMENTAL MINE

Colorado School of Mines

Idaho Springs, Colorado

N. 2600 Ft.

E. 5000 Ft.
E. 5200 Ft.
E. 5400 Ft.
E. 5600 Ft.
E. 5800 Ft.
E. 6000 Ft.

RAISE

AIR DOOR

N. 2400 Ft.

AIR DOOR

AIR DOOR

AIR DOOR

N. 2200 Ft.

AIR DOOR

AIR DOOR

AIR DOOR

AIR DOOR

AIR DOOR

RAISE

N. 2000 Ft.

AIR DOOR

AIR DOOR

BATOR STOPE

STOPE

AIR DOOR

N. 1800 Ft.

AIR DOOR

RAISE

AIR DOOR

AIR DOOR

AIR DOOR

AIR DOOR

MAZE

RAISE

N. 1600 Ft.

DAM

N. 1400 Ft.

AIR DOOR

LEGEND

RAISE

AIR DOOR

FIRE EXTINGUISHER

FIRST AID STATION

PHONE

RADIO

COMPRESSORS
1200 Ft.
LAMP ROOM

OFFICE

DRY

SHOP

EDGAR-MINE DWG. 06-10-09

SCALE (FEET)

0   50   100   200

DRILL SHED

FUEL & OIL
STORAGE

ICC

N. 1000 Ft.

COLORADO SCHOOL OF MINES

EDGAR EXPERIMENTAL MINE

IDAHO SPRINGS, COLORADO

66

QUIZ

The following questions are intended to evaluate the knowledge gained from participating in this training. These questions can be used as a stand-alone quiz, or can be incorporated into a larger examination if this training presentation is given as a single session of a larger training course.

1. Which of the following internal roadblocks to effective listening is exemplified by the statement, "We've never done it that way before?"

   a. Halo effect
   b. Stereotyping
   c. Hearing only facts and not feelings
   d. Resistance to change
   e. Hearing only what is expected

2. Communication is a one-way process.

   a. True
   b. False

3. During an emergency, which of the following is likely to be true?

   a. People will listen more closely because they need the information badly.
   b. People are automatically able to filter out unnecessary information.
   c. People are busy with survival and do not need information.
   d. People have additional challenges that make it harder to comprehend information.

4. Which statement is true?

   a. All people who live in the United States communicate in the same way.
   b. Gestures that Americans take for granted can be offensive to others.
   c. Communication is not affected by geographic area of the country.
   d. Emergency managers only need to be concerned with cross-cultural communication.

5. Our cultural traditions:

   a. Have no bearing on how we communicate.
   b. Are not offensive to others who live in the United States.
   c. Affect how we think, act, and communicate.
   d. Should not be reflected in how we speak or write.

6. Cultural differences reflect internal beliefs and thought patterns that cause people to react differently to the same situation.

   a. True
   b. False

7. A first step in communicating across cultures or with special-needs populations is to:

   a. Not assume sameness.
   b. Learn to speak their language.
   c. Place responsibility for communications on the receiver.
   d. Immerse yourself in all represented cultures.

8. A good indicator that an individual has not understood what you said is:

   a. A smile.
   b. The ability to paraphrase what was said.
   c. Asking questions that require further detail.
   d. A puzzled look.

9. Which statement is true?

   a. Verbal and nonverbal communications always match.
   b. When verbal and nonverbal messages conflict, words are more persuasive than nonverbal cues.
   c. Nonverbal cues are automatic echoes of spoken messages.
   d. Nonverbal cues transmit 65% of the meaning of our communication.

10. Which of the following measurements is the preferred distance for personal conversation in the United States?

    a. 1 to 2 feet
    b. 1.5 to 4 feet
    c. 4 to 12 feet
    d. 12 feet or more

11. Frowning, staring elsewhere, tightened posture, and leaning away from the speaker constitute a nonverbal cluster that indicates what emotion in the United States?

    a. Disagreement
    b. Boredom
    c. Evaluation
    d. Understanding

12. If a reporter asks you, "When did your team stop floundering and get control of this emergency response?" which of the following is your best response?

   a. "My team stopped floundering and got control of this response from the beginning."
   b. "My team initiated a unified, professional response from the start."
   c. "Correction: My team never floundered in this response."
   d. "I'm not going to honor your provocative question with a response."

13. Active listening involves:

   a. Completing the speaker's sentence.
   b. Attending to the facts, not feelings.
   c. Making assumptions about what the speaker is saying.
   d. Paraphrasing what the speaker said.

14. Which of the following is an <u>external</u> roadblock to effective listening?

   a. Noise
   b. Defensiveness
   c. Resistance to change
   d. Stereotyping

15. One difference between emergency and day-to-day communications is that:

   a. Day-to-day communications are more critical.
   b. Day-to-day communications are more timely.
   c. Emergency communications require no response.
   d. Emergency communications must be consistent.

ANSWERS

1. d
2. b
3. d
4. b
5. c
6. a
7. a
8. d
9. d
10. b
11. a
12. b
13. d
14. a
15. d

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