NEW MINERS

DEEP METAL/NONMETAL

ENTERING AND LEAVING THE MINE, TRANSPORTATION, COMMUNICATION

1981

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DEEP METAL/NONMETAL

COURSE PLAN: ENTERING AND LEAVING THE MINE; TRANSPORTATION; COMMUNICATIONS

I. GOAL: The goal of this module is to insure that the miner can use the mine's transportation and communications systems safely and effectively.

II. BACKGROUND:

Accidents related to motion of powered haulage transportation equipment and hoisting equipment in 1979 totaled 487 in underground metal/nonmetal mines. Eight of these resulted in fatalities and 354 resulted in days lost from the job. The frequency of these accidents established the importance of training on transportation controls and hoisting operations. Communications are critical to mine operations, equipment conditions, and emergency warnings.

III. OBJECTIVES

A. Trainer will do the following:

1. Demonstrate the communications system used in mine.
2. Explain the means of transportation used by miners and materials.
3. Demonstrate the types of signals and signs used in the mine.
4. Demonstrate check-in and check-out system used in the mine and identification devices to be worn by miner.
5. Explain company policy for entering and leaving mine and use of transportation systems.
6. Describe hazards involved in transportation systems.

B. Trainees will be able to do the following:

1. Describe the communications system and make appropriate use of simulated communications system (or actual system).
2. Describe the procedures for using the transportation system including appropriate safety measures to be used.
3. Demonstrate the correct meaning when presented with signs and signals used in mine.
4. Demonstrate correctly the use of check-in and check-out procedures using simulated or actual situation.
5. Describe company policy for entering and leaving mine and use of transportation system.
6. Describe hazards involved in transportation and appropriate safety measures to be taken.

IV. ACTIVITIES

A. On site - in conjunction with introduction to work environments

1. Use checkin-checkout system
2. Have trainees take turns guiding the class through the transportation system
3. Practice with trainees in using the local mine signaling system

B. In classroom

1. Use model checkin-checkout system
2. Use model signal system

V. MATERIALS

A. Visual aids

B. Simulations (or actual objects)

1. Checkin-checkout system
2. Signaling system

C. Copies of company policy regarding entering and leaving the mine.

VI. EVALUATION

A. Verbal descriptions

1. Communications system
2. Procedure for using transportation system, hazards, and appropriate safety measures

B. Performance

1. Use of checkin-checkout system correctly
2. Follow correct procedures on transportation system

C. Written evaluation - Self Checks

1. Any time hands on appraisal such as operating equipment or walking prescribed routes is possible it should be used.
2. Eliminate the use of self-checks if too difficult for your class.
3. Change written self-check items where necessary to fit your local mine situation.

VII. RESOURCES

A. Training standards: CFR 30 Part 48.5-3

B. Company policies regarding entering and leaving mine and transportation

C. Applicable MSHA fatalgrams

TOPICS COVERED

I. CHECK-IN CHECKOUT PROCEDURES

A. Reason for system

1. locate miner who fails to return
2. eliminate need for search

B. Identification devices worn by miner

C. Procedures and company policy

II. TRANSPORTATION SYSTEM

A. Man trips

1. load limits
2. riding techniques

B. Materials trips

1. ore
   a. trucks
   b. ore cars
2. equipment
   a. machinery
   b. explosives
   c. other supplies used in the mine

C. Hazards involved in transportation system

1. objects protruding from the back and sides
2. falling out of or off moving equipment
3. injury to body parts hanging out of trip and hitting the side or some other object
4. flying objects when equipment stops suddenly, derails, or is involved in a collision
5. body parts touching electrical power sources
6. collison due to excessive speed
7. collision due to not seeing other vehicle or people walking

8. injury to eyes or lungs from dust
9. materials on the cage not being correctly secured

III. COMMUNICATION SYSTEM

A. Mine communications

1. phones
2. pull bottles

B. Equipment signals

1. backing-up signal
2. bells on motors
3. equipment status signals

C. Mine emergency warning signals

1. warning signals: stench canisters and alarms
2. Escapeway marking signs.

DEEP METAL/NONMETAL

LESSON GUIDE AND MATERIALS: ENTERING AND LEAVING THE MINE; TRANSPORTATION; COMMUNICATION

I. CHECK-IN AND CHECK-OUT PROCEDURES

A. The check-in and check-out system is used to keep a current record of all mine personnel and visitors present in the mine. This information is essential during a mine emergency. By law, this record is kept on the surface in a place safe from fire or other hazard.

1. In the event of an emergency, this system aids mine rescue in identifying and locating any miner who fails to return and check-out. Management can determine where the miner was working and thereby focus mine rescue efforts.

2. By checking-out of the mine when leaving, mine rescue teams will not waste time and risk their lives looking for someone who is not in the mine at all.

3. The system is also used to locate a miner in case of a personal emergency i.e. a sick or injured family member etc.

B. The check-in and check-out procedure uses an identification tag called brass. Brass has your name or some other identification number stamped on it. A second brass may also be permanently attached to your lamp belt.

VISUALS NOTE: SHOW VISUAL 3, A SLIDE OR DRAWING OF YOUR CHECK-IN AND CHECK-OUT STATION.

C. The company policy is that all miners follow check-in procedures when entering the mine. Place your brass on a hook at the station. When leaving the mine check-out by removing your brass from the hook. Keep brass for the next work day.

INSTRUCTOR'S NOTE: EXPAND YOUR DISCUSSION OF COMPANY POLICY ON CHECK-IN AND CHECK-OUT PROCEDURES AS NECESSARY.

II. MINE TRANSPORTATION SYSTEM

A. Man trips are rubber-tired or track vehicles or shaft cages designed to transport miners between the working areas of a mine and the dry room or bath house used to change clothes and clean-up.

1. Man trips are designed to carry a certain number of miners. Attempting to crowd more miners on a man trip than it is designed for is a safety hazard and should be avoided.

2. When boarding the man trips other than cages, both hands should be emptied of tools and lunch pail. You need your hands to assist getting into the man trip. Place your tools and lunch pail in the man trip before boarding.

3. Once in the man trip and underway, keep your head, arms and legs inside. You could accidently hit the side or piece of equipment when leaning out. Also make sure that any equipment or tools such as picks, shovels or slate bars do not stick out of the car or cage.

B. Material trips are used for both ore and mining equipment.

1. Haulage of ore is done by rubber tired or track vehicles. Young buggies, ore cars, or muck cars are used to transport the ore from the drifts and stopes to belt lines and/or to the ore skip which hauls ore up the shaft to the mill.

2. Equipment trips are used to bring various supplies into the mine. These supplies include mining machinery, fuel and explosives.

3. Hazards involved in transportation system.

a. Objects protruding from the sides or tne back, such as rock, timber, or pipes.

b. Falling out of or off moving equipment due to recklessness, bumps, quick stops or horseplay.

c. Injury to head, arms, hand or legs, that are hanging out of the trip and hit a rib or other object.

VISUALS NOTE: SHOW VISUAL 4 ILLUSTRATING THE MINER'S HEAD CAUGHT BETWEEN A LOCOMOTIVE AND AN ORE PASS, AND/OR VISUAL 5 ILLUSTRATING THE MINER'S ARM CAUGHT BETWEEN MAN CAR AND RIB TIMBER.

d. Flying objects, such as lunch pails, tools, or rock, when the trip stops suddenly, derails, or is involved in a collision.

e. Body parts hanging out of trip and making contact with an electrical power source.

f. Collision of trip due to excessive speed and subsequent loss of control or brake failure.

g. Collision of trip with other vehicle or striking person due to poor visibility or inattention.

h. Injury to eyes or lungs from dust or small particles.

VISUALS NOTE: SHOW VISUAL 51 ILLUSTRATING THE SECURING OF LOOSE MATERIAL.

i. Materials on the cage not being secured correctly.

INSTRUCTOR'S NOTE: MENTION TO THE STUDENTS THE AVAILABILITY OF RESPIRATOR FILTERS FOR PROTECTION FROM DUST. USE OF FILTERS IS MORE THOROUGHLY DISCUSSED IN THE TRAINING MATERIALS ON SELF-RESCUE AND RESPIRATORY DEVICES.

EVALUATION NOTE: HAVE TRAINEES ANSWER SELF-CHECK NUMBER ONE INDIVIDUALLY OR IN GROUPS OF THREE OR FOUR. REVIEW RESPONSES AND CLARIFY INCORRECT ANSWERS. QUESTIONS CONCERN THE MINE TRANSPORTATION SYSTEM AND CHECK-IN AND CHECK-OUT PROCEDURES.

IV. MINE COMMUNICATION SYSTEM.

A. Mine communications are important for routine messages. Requests for supplies or assistance with operational problems save time when done over an efficient communications system. In the case of accident or other emergency, people in the mine must be able to tell people on the surface what happened so that proper measures can be taken quickly.

1. The law requires that two-way communication systems be provided at several locations in the mine. These include all levels of the main shaft and slopes, and between the surface and each working section. Phone systems are commonly used to provide two-way communcations.

INSTRUCTOR'S NOTE: DESCRIBE HOW TO USE THE PHONE SYSTEM AT YOUR MINE. INCLUDE USE OF KEYS AND PAGING IN YOUR DISCUSSION.

2. Communications with the hoistman is done by pull bottles located at each level of the shaft.

DEMONSTRATION NOTE: SHOW THE STUDENTS HOW TO COMMUNICATE WITH THE HOISTMAN USING A PULL BOTTLE. EXPLAIN THE PULL BOTTLE COMMUNICATION SYSTEM WITH THE NUMBER AND SEQUENCE OF PULLS.

B. Equipment signals are signals mounted on equipment to warn the operator or others of some particular condition of the vehicle.

1. Backing-up signals warn others that the vehicle is in reverse gear and that they should immediately move out of its way.

2. A bell may sound when a motor starts up.

3. Equipment status signals inform the operator of critical status levels of various components of the equipment, such as low oil or hydraulic pressure.

C. Mine emergency warning signals alert miners to immediately initiate mine evacuation procedures.

1. Warning signals inform miners of the emergency, and can be of two types.

   a. Stench canisters containing a smell of rotten eggs.
   b. Alarms located throughout the mine.

2. Another important emergency signal is the escapeway marking signs located throughout the mine. Their directional information guides miners through the escapeways system.

EVALUATION NOTE: HAVE TRAINEES ANSWER SELF-CHECK NUMBER TWO. TRAINEES MAY ANSWER QUESTIONS INDIVIDUALLY OR IN GROUPS OF THREE OR FOUR. REVIEW CORRECT ANSWERS AND CLARIFY INCORRECT ANSWERS. QUESTIONS CONCERN THE MINE COMMUNICATION SYSTEM.

SELF CHECK #1 SOLUTIONS

1. c
2. true
3. b
4. tools and lunch pail (hard hat should be worn)
5. e

SELF CHECK #2 SOLUTIONS

1. true
2. true
3. false
4. true
5. d

SELF CHECK: ENTERING AND LEAVING THE MINE; TRANSPORTATION; COMMUNICATION

SELF CHECK #1: CHECK-IN AND CHECK-OUT PROCEDURES AND TRANSPORTATION

1. The reason for wearing your brass identification tag is:

   a. adding one more thing to do

   b. the shine could be seen in an emergency

   c. in emergency situations, mine rescue teams can determine where a missing miner was working

2. Mine rescue teams will not waste time and risk their lives looking for someone who is not in the mine at all if workers have correctly used check-in and check-out procedures. (true, false)

3. Attempting to crowd more miners on a man trip than it is designed for

   a. helps save money & time by requiring fewer trips

   b. is a safety hazard and should be avoided

   c. encourages friendships

   d. both a. and c.

4. Place (yourself, tools and lunch pail, hard hat) in the man trip before boarding.

5. Hazards involved in transportation system include

   a. injury to head, arms, legs hanging out of the trip and hitting a rib or other object

   b. flying objects such as lunch pails, tools, or rock when trip is involved in derailment, sudden stops, or collision

   c. damage to eyes and lungs from dust in the air

   d. collision of trip with other vehicle or striking person due to poor visability or inattention

   e. all of the above

SELF CHECK #2: MINE COMMUNICATION SYSTEM

1. It is a legal requirement that a mine provide 2-way communications systems at several locations in the mine. (true or false)

2. Warning signals may be seen (flashing lights), heard (a bell sounding), or smelled (stench cannisters). (true or false)

3. Routine messages such as requests for supplies or assistance with operational problems should be handled by man trips or equipment trips. (true or false)

4. In emergency situations an efficient two-way communication system can tell people on the surface what has happened so that proper measures can be taken quickly. (true or false)

5. Upon hearing bells sounding, an equipment operator would check to see if:

   a. his machine was low on oil or hydraulic pressure

   b. a motor was starting up

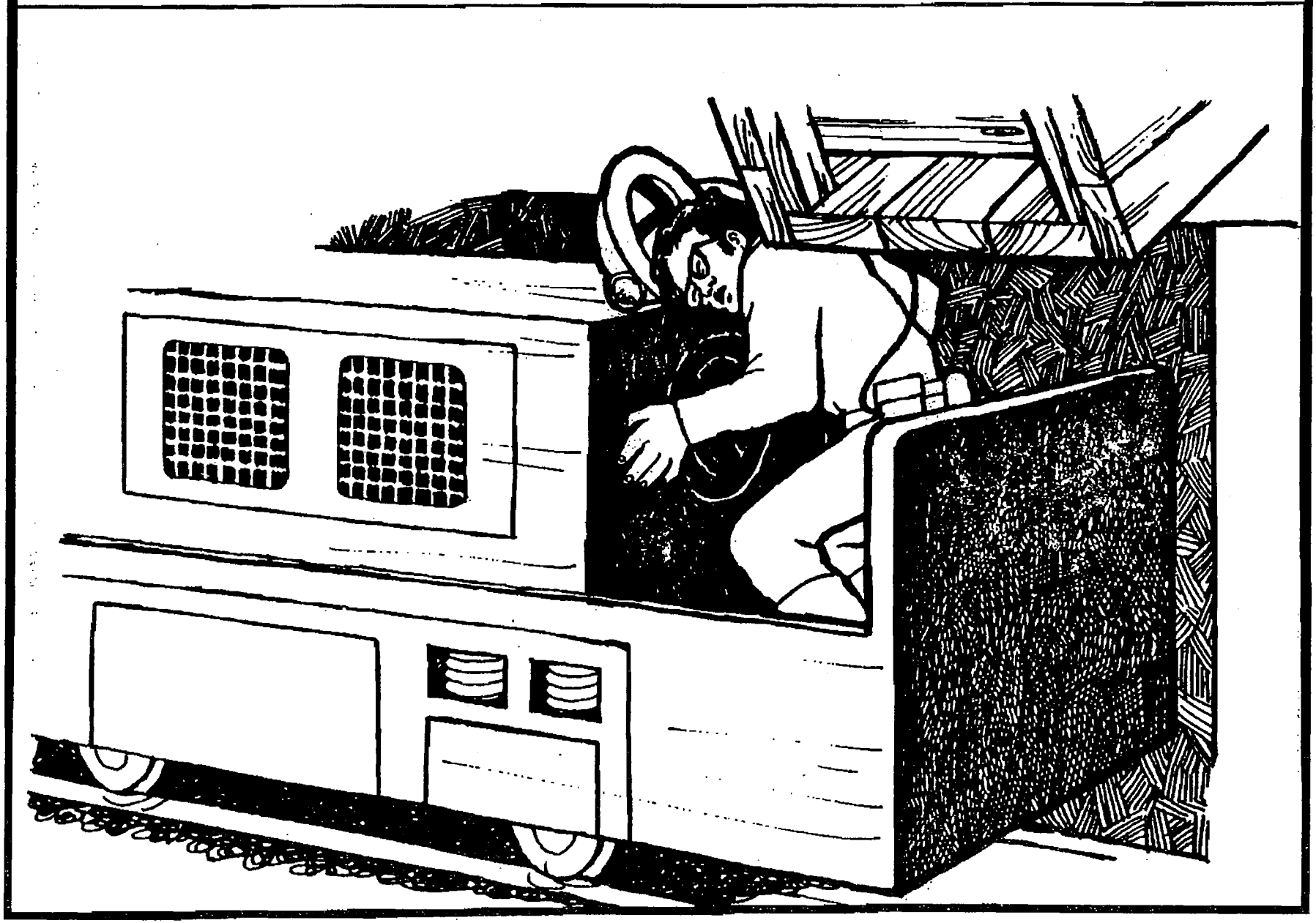
   c. another piece of equipment was in reverse gear and whether he needs to move his machine out of the way

   d. all of the above

CHECK-IN & CHECK-OUT STATION

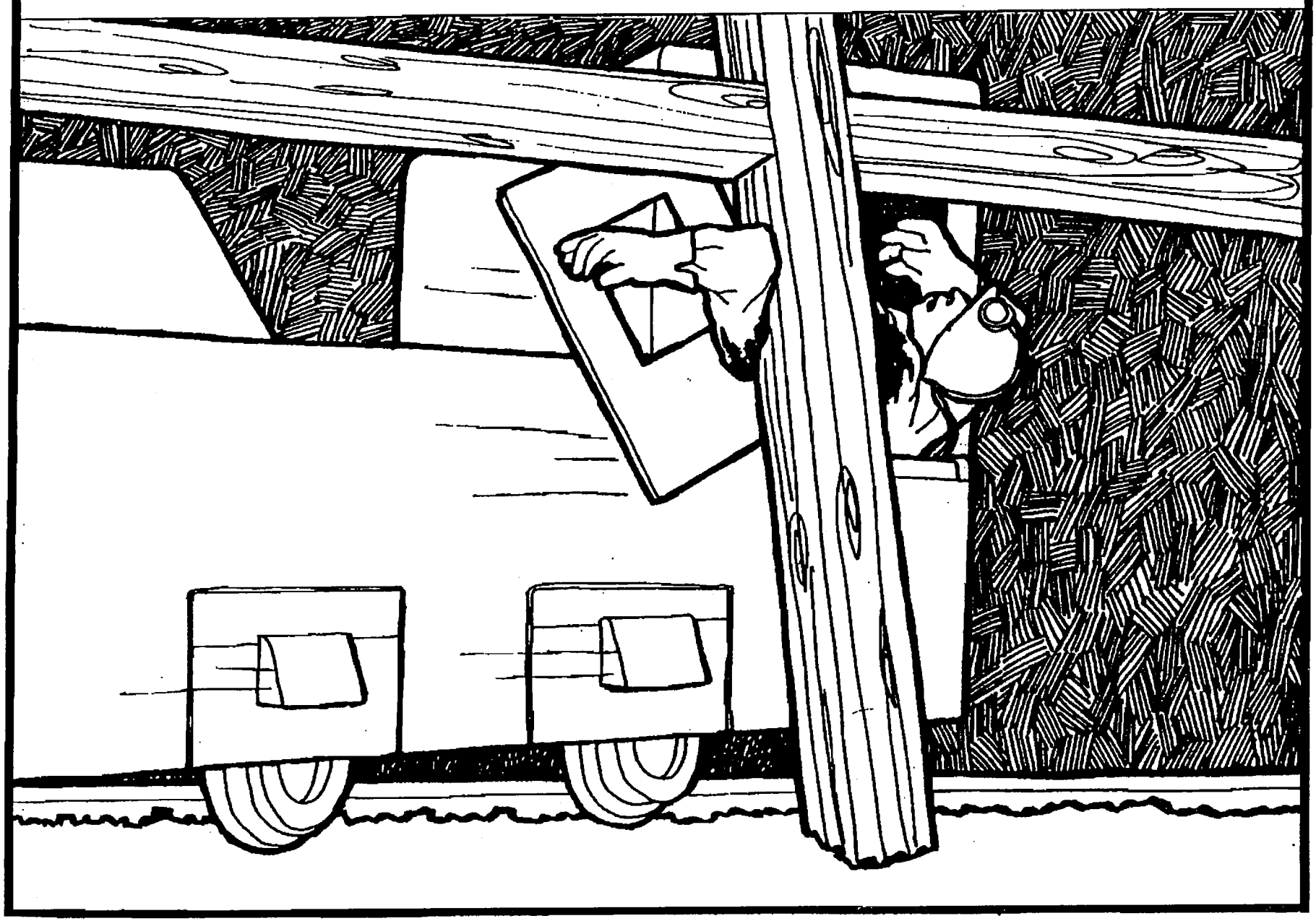
VISUAL 3

FACE IN DIRECTION OF TRAVEL



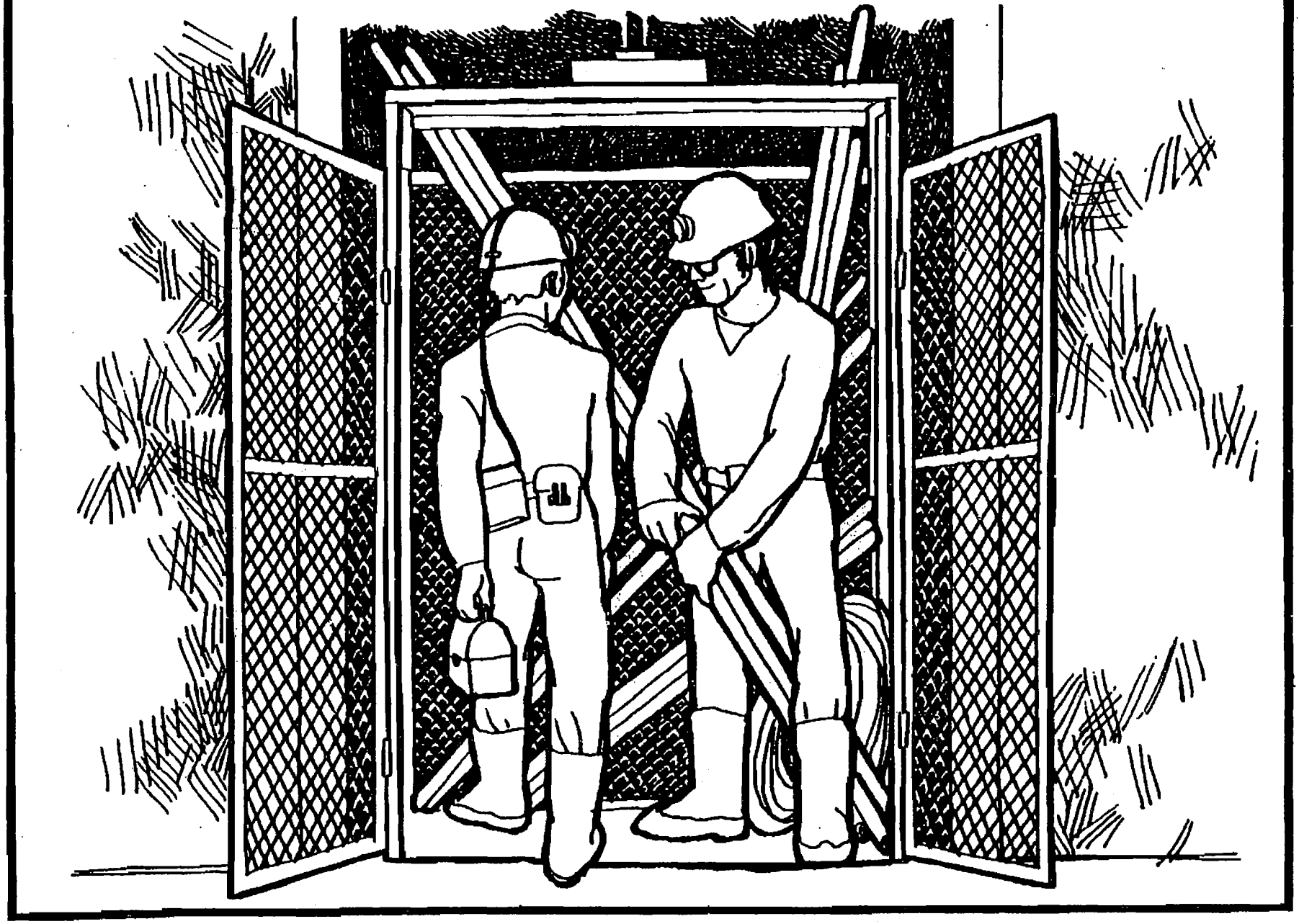
VISUAL 4

KEEP ARMS AND HEAD INSIDE



VISUAL 5

SECURE LOOSE MATERIALS



VISUAL 51