

# **Roof Fall Entrapment**

## **Instructor's Copy**

Behavioral Research Aspects of Safety and Health Group (BRASH)  
Institute for Mining and Minerals Research (IMMR)  
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<sup>1</sup> This exercise was developed and field tested under U. S. Bureau of Mines research contract no. H0348040. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies or recommendations of the Interior Department's Bureau of Mines or the U. S. Government.

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## Introduction

This document contains most of the materials needed to use the exercise. The main part of the document is the instructor's copy. It tells how to use the exercise, presents the objectives, the master answer sheet, the scoring key, and discussion notes to be used following the exercise. The last part of this document is three appendices.

Appendix A is the exercise problem booklet. This booklet can be duplicated locally. The booklets are reusable. One is needed for every person in the classroom. Appendix B is the answer sheet. Copies of this answer sheet must have the invisible ink answers that appear in Appendix C printed on them.<sup>2</sup> Answer sheets are consumable. One is needed for each person or each small group of persons who work the exercise.

## Exercise Summary

Read this section first. It determines if the exercise is appropriate for your classes. If you choose to use the exercise, examine the table of contents and review the remainder of this document.

Type: Invisible ink

Length: Nine questions

Skills: Recalling pillar extraction and ground control procedures  
Recognizing signs of unstable roof  
Locating a safe waiting place after being trapped in an entry by a roof fall  
Waiting for rescue and taking constructive action to prevent injury to yourself and/or the rescuers  
Communicating with the rescuers while trapped

Location: Underground

Problem: A group of miners are extracting pillars in an unsafe manner. There is only one escapeway from the area where they are working. Earlier falls have blocked the other escapeways. The top is bad in the entry being used for the haul road. The posts and crossbars that support the top at the intersection of a crosscut begin to sag so much that the shuttle car you are driving can't come out from the face. The foreman yells to you to tell the miners to get out. But it is too late! As you are about to come out there is a large roof fall that completely blocks the one escapeway. You and the other miners are lucky. No one is hurt. But now you have to decide what to do.

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<sup>2</sup> You can do this yourself if you have the proper equipment, or you may obtain copies of preprinted answer sheets from MSHA, National Mine Health & Safety Academy, Dept. of Instructional Materials, 1301 Airport Road, Beaver, WV 25813-9426 phone 304-256-3257, fax 304-256-3368 or email to lord-mary@msha.gov.

## **HOW TO USE THIS EXERCISE**

1. Look at the performance objectives. Decide if the exercise is relevant for your mine training class.
2. Work through the exercise with the developing pen and score your responses.
3. Read the master answer sheet for the exercise. Look at all the answers.
4. Read the Instructor's Discussion Notes for the exercise.
5. Become thoroughly familiar with the problem so that you can present it to your class without reading it. Put the maps or illustrations on an overhead projector so you can use these to help explain the problem.
6. When you present the exercise to the class:
  - Give each person an exercise booklet, and each group of 3 to 5 one answer sheet and a developing pen.
  - Demonstrate how to select and mark answers using the developing pen.
  - Go over the instructions for doing the exercise with the whole group.
  - Explain the problem making sure everyone understands the problem situation.
  - Have the class members work the exercise.
  - When the class members finish, have them figure up their score using the instructions at the end of the exercise.
  - When everyone has finished, discuss the exercise. Let class members discuss the merits of each answer. Add your own ideas.

### Performance Objectives for Roof Fall Entrapment

Objective number	Capability verb(s)	Description of required performance and conditions under which it is to occur
1. GC <sup>3</sup>	Recall	Appropriate times to check roof conditions
2. EE	Recognize	The danger of attempting to move a fall without proper roof support
3. EE/GC	Recognize Select	The safest location to await rescue when entrapped behind a roof fall
4. EE	Recall	Signaling procedures for an entrapment situation Select
5. EE	Recognize Select Order	Procedures for reporting and beginning rescue procedures during an entrapment accident
6. EE/GC	Identify Recognize	Cues that indicate an impending roof fall
7. EE/GC	Identify Recognize	Proper and improper practices for roof control during pillar extraction
8. EE/GC	Recall Identify List	Ground control and mine conditions that prohibit pillar extraction because of threats to miners' safety

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<sup>3</sup> Skill and knowledge domain abbreviations:  
 GC = ground control  
 EE = emergency evacuation and escape

## Master Answer Sheet for Roof Fall Entrapment

Use this answer sheet to mark your selections. Rub the developing pen gently and smoothly between the brackets. Don't scrub the pen or the message may blur. Be sure to color in the entire message once you make a selection. Otherwise you may not get the information you need.

### Question A (Select as MANY as you think are correct)

1. [ Correct! Everyone says that they are OK. ]
2. [ Correct! You yell to him and can barely hear him say that he will get you out. ]
3. [ You should not split up or leave this area now. ]
4. [ It would be dangerous to try to move the fall. Air is not a major concern at  
[ this time. ]
5. [ There are things you should be doing now. ]
6. [ Correct! The top appears to be good nearly all the way up to the E6-C39  
[ intersection. It is still working near the fall. ]

### Question B (Choose only ONE unless you are told to "Try again!")

7. [ The top over the fall is not supported and is still working. This would be  
[ very dangerous. Try again! ]
8. [ Correct! This should be done as soon as possible in the safest area. Do  
[ the next question. ]
9. [ The power to the miner has been cut by the fall. Anyway, this could be  
[ dangerous. Try again! ]
10. [ You should try to calm Jimmy and keep him away from the fall area. Try  
[ again! ]

### Question C (Choose only ONE unless directed to "Try again!")

11. [ This area is inside an incomplete pillar. It is not safe. Try again! ]
12. [ Correct! This is the safest place because it is between the two most  
[ complete pillars. Do the next question. ]
13. [ Position C is not safe. The incomplete pillars make this area unstable.  
[ Try again! ]
14. [ The split pillar on the left, and the cut pillar on the right, make this area  
[ unstable. Try again! ]

**Question D** (Choose only ONE unless directed to "Try again!")

15. [ This is dangerous. The top is still working near the fall. Try again! ]
16. [ Air would not be a major concern in this large an area. There is something ]  
[ else you should be doing. Try again! ]
17. [ Correct! You need to stay under the extra support. The top is weak. ]  
[ Jimmy is upset. You should keep an eye on him. Do the next question. ]
18. [ Pounding the top could possibly cause another fall. The top is weak. ]  
[ Anyway, the others know where you are. Try again! ]

**Question E** (Choose only ONE unless directed to "Try again!")

19. [ There is something else he should have done first. Try again! ]
20. [ Correct! He should have immediately called for help and equipment, ]  
[ including first aid supplies. Do the next question. ]
21. [ He should have done something else. Try again! ]
22. [ This is dangerous. He might have been killed and been of no help to the ]  
[ others. Try again! ]

**Question F** (Choose only ONE unless directed to "Try again!")

23. [ There is something else he should have done. Try again! ]
24. [ This is dangerous. Try again! ]  
[ ]
25. [ This is risky. Try again! ]
26. [ The help he sent for will arrive at today's fall. Try again! ]
27. [ Correct! It is wise to plan, gather materials, talk to the trapped miners, and ]  
[ not try to support the bad top until help arrives. Do the next question. ]

**Question G** (Choose only ONE unless you are told to "Try again!")

28. [ This is not safe. Try again! ]
29. [ This area is not safe. Anyway, help is on the way to position B. The  
[ foreman has told the others where you are. Try again! ]
30. [ Correct! Soon you hear rock being moved. Do the next question. ]
31. [ This is dangerous. There is less pillar support at position E than at  
[ position B. Try again! ]

**Question H** (Choose only ONE unless you are told to "Try again!")

32. [ This is dangerous. Try again! ]
33. [ This is dangerous. Try again! ]
34. [ You should not remove these timbers. The falls may have made this area  
[ unstable. Try again! ]
35. [ Correct! You should stay at position B until the way out is made safe. It is  
[ important to talk with the rescuers while you wait. Do the next question. ]

**Question I**

On your answer sheet, list all the unsafe mining practices and violations of state and federal laws that occurred in this problem.

**End Of Problem**

Finding your score

Number of "Correct" answers you colored in = (1) \_\_\_\_\_

25 minus the number of incorrect answers you colored in = (2) \_\_\_\_\_

Add blanks one and two to get your total score = (3) \_\_\_\_\_

Highest possible score = 35

Lowest possible score = 0



## Instructor's Discussion Notes for Roof Fall Entrapment

Use the information presented here and on the master answer sheet, your own ideas and experience, and those of the miners in your class to discuss the exercise after it is completed. Group discussion can help strengthen knowledge and skills, correct errors, and relate the exercise content to the experiences of the miners. After they have worked the exercise, miners enjoy discussing the problem. They also frequently think of better ways to respond to a problem than those listed among the answers. The purpose of the exercise is to help miners think about and remember basic knowledge and skills they may someday need to deal with a mine emergency. The discussion following the exercise can contribute to this goal and tailor the exercise content to the needs of the group.

It is helpful to show overhead transparencies of the answers on the master answer sheet during the discussion, while the miners look at their problem booklets. This allows you to lead the group through the exercise and to discuss all the answers to each question. Most of the information about why particular answers are correct or incorrect is given on the master answer sheet.

The following notes provide additional information for you to discuss with your class. Read through and think about the notes before the class. Don't read the notes to the class members. This would be boring and ineffective. Rather, incorporate the ideas you find here with your own ideas and make these points at the appropriate place in the discussion of the exercise.

**Question A** - The correct answers are 1, 2, and 6. After a roof fall has occurred, miners trapped behind that fall should 1) check the top to determine the safety of their positions; 2) check to see if anyone has been hurt, and 3) attempt to communicate with someone outby the fall. Miners should not split up (3) in a situation like this one. Moving the fall (4) also should not be attempted. This activity could expose the miners to a second roof fall. In an area this large the air supply (4) would not be a major concern. The top near the fall is the most immediate danger.

**Question B** - The correct answer is 8. Although just sitting and waiting may be difficult, it is the safest thing to do. The trapped miners know that someone outby the fall knows their location. Any attempt to go near the fall (10), where the top is working, would be dangerous. The safest place to wait (the area with the most pillar support) should be selected. Then extra support should be added if at all possible.

**Question C** - The correct answer is 12. The safest place to be when there is a ground control problem is usually between complete pillars. These pillars are the best form of support. Incomplete pillars make the area around them unstable.

**Question D** - The correct answer is 17. Sitting and waiting for rescue is the safest thing to do in this situation. Talking may help calm a miner who is too upset to think clearly. What should and should not be done can be discussed. Signaling (18) is not necessary at this point because the foreman knows the location of the trapped miners, and because he can hear them and they can hear him.

**Question E** - The correct answer is 20. When an accident occurs it should be immediately reported to the outside. Rescue operations can best be coordinated from there. An individual should never begin rescue procedures (22) without asking for help first. In this case, another fall of roof could kill or injure the foreman, making him incapable of calling for help and delaying rescue of the trapped miners.

**Question F** - The correct answer is 27. The foreman should gather roof support materials, talk to the trapped miners to keep them informed, and plan the best way to support the top. Because the area is unstable and the top is weak, he should not begin supporting the roof (25) until help arrives. He could be injured or killed in a second fall. He is the only one who knows the details and conditions of the trapped miners. He is also at the scene and in the best position to make an assessment of what is needed to support the roof and rescue the trapped miners. Stopping to think and plan is important. The time he spends planning while the others arrive will not be wasted.

**Question G** - The correct answer is 30. Even if communication is lost, signaling is not necessary if the entrapped miners know that their location has been reported. In this situation, it would be unwise to pound on the top, rib, bottom, or posts. The area is unstable.

**Question H** - The correct answer is 35. The entrapped miners should wait until their rescuers create a safe escapeway. Roof support needs to be added through and inby the fall to create the escapeway. Waiting is difficult but the miners should not put themselves in a dangerous position, (under unsupported top) while escaping. The trapped miners should watch carefully as the rescue team comes through the roof fall. Rescuers are sometimes prone to rush in to see if the trapped miners are all right. The trapped miners should watch the top on their side of the fall and warn the rescuers if there is any dribbling or other signs of weak top.

**Question I** - Some of the violations and poor practices include:

- Failure to file and/or to follow a proper roof control plan for pillar extraction (CFR 75.200-11);
- Cutting pillars on more than one side of the mining crew, and working inby cut pillars (CFR 72-201(h));
- Inadequate examination of escapeways and the working area (CFR 75.1704-2);
- Working in an area with only one escapeway when the top is known to be bad;
- Insufficient number of breaker posts, turn posts, and roadway supports (CFR 75.200-11(c),(e), and (f));
- Possible inadequate plan for, inadequate supervision of, and inexperienced miners involved in roof support for pillar recovery (CFR 75.200-14);
- Possible inadequate ventilation of the working face during pillar extraction (CFR 75.328).

## **References**

Moody, Geralt F. (1979). Report of investigation (underground coal mine) entrapment. Mine I. D. No. 36-00906, Green County, PA, Monroeville, PA: MSHA, District 2, Subdistrict Office.

Office of the Federal Register. (July 1984). Code of Federal Regulations. Title 30 (Part 75). Washington, DC: U.S. Government Printing Office.

## Scoring Key for Roof Fall Entrapment

The correct answers are marked with an asterisk.<sup>4</sup>

Question	Answer Number					
A	1*	2*	3	4	5	6*
B	7	8*	9	10		
C	11	12*	13	14		
D	15	16	17*	18		
E	19	20*	21	22		
F	23	24	25	26	27*	
G	28	29	30*	31		
H	32	33	34	35*		

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<sup>4</sup> This page is printed in large type so that it may be copied and used as an overhead transparency.

## **Appendix A: Problem Booklet**

Duplicate this copy of the problem booklet for use in your classes. **Booklets should be printed on only one side of the paper.** Each person in your class should have a problem booklet while they are working the exercise. The problem booklets are reusable.

You may obtain a copy of the problem booklet from MSHA, National Mine Health & Safety Academy, Dept. of Instructional Materials, 1301 Airport Road, Beaver, WV 25813-9426 phone 304-256-3257, fax 304-256-3368 or email to [lord-mary@msha.gov](mailto:lord-mary@msha.gov).

**Roof Fall Entrapment**

**Problem Booklet**

## **Instructions**

Read the problem situation described on the next page. Study the map until you understand the location of the miners and equipment in the problem. Next, answer each of the 9 questions. Do them one at a time. Don't jump ahead, but you may look back to earlier questions and answers. Some questions ask you to select all of the answers that you think are correct. Other questions ask you to select only one answer unless you are told to "Try again!" Follow the directions for each question.

After you have selected a choice to a question, look up its number on the answer sheet. Select your answer(s) to each question by rubbing the developing pen between the brackets on the answer sheet. A hidden message will appear and tell you if you are right. When you have finished, you will learn how to score your performance.

## **Background**

A continuous miner is being used in a 78 inch (6.5 ft) seam.

Pillars are being recovered.

It is near the end of the shift.

The preshift examiner for the second shift will soon be on the section.

Three unplanned roof falls have occurred on this section.

Times and locations of roof falls are shown in Figure 1.

## **Problem**

You are a shuttle car operator. The preshift examiner reported that the posts in the intersection of the number 6 entry (E6) and crosscut number 39 (C39) were bent. At the beginning of your shift, more posts were added and crossbars were installed. Since then, the shift has gone as usual.

You are tramping out your loaded car and find that it won't fit under the new crossbars. (it cleared the bars easily before.) You see that the roof is working in the intersection.

The foreman is outby the intersection. You yell to him that the top is working. He instructs you to go and tell the other miners to come out, while he stays to watch the roof conditions. You return to the face in your shuttle car and tell everyone that the boss says to get out.

After studying the map on page 4, turn the page and answer the first question.



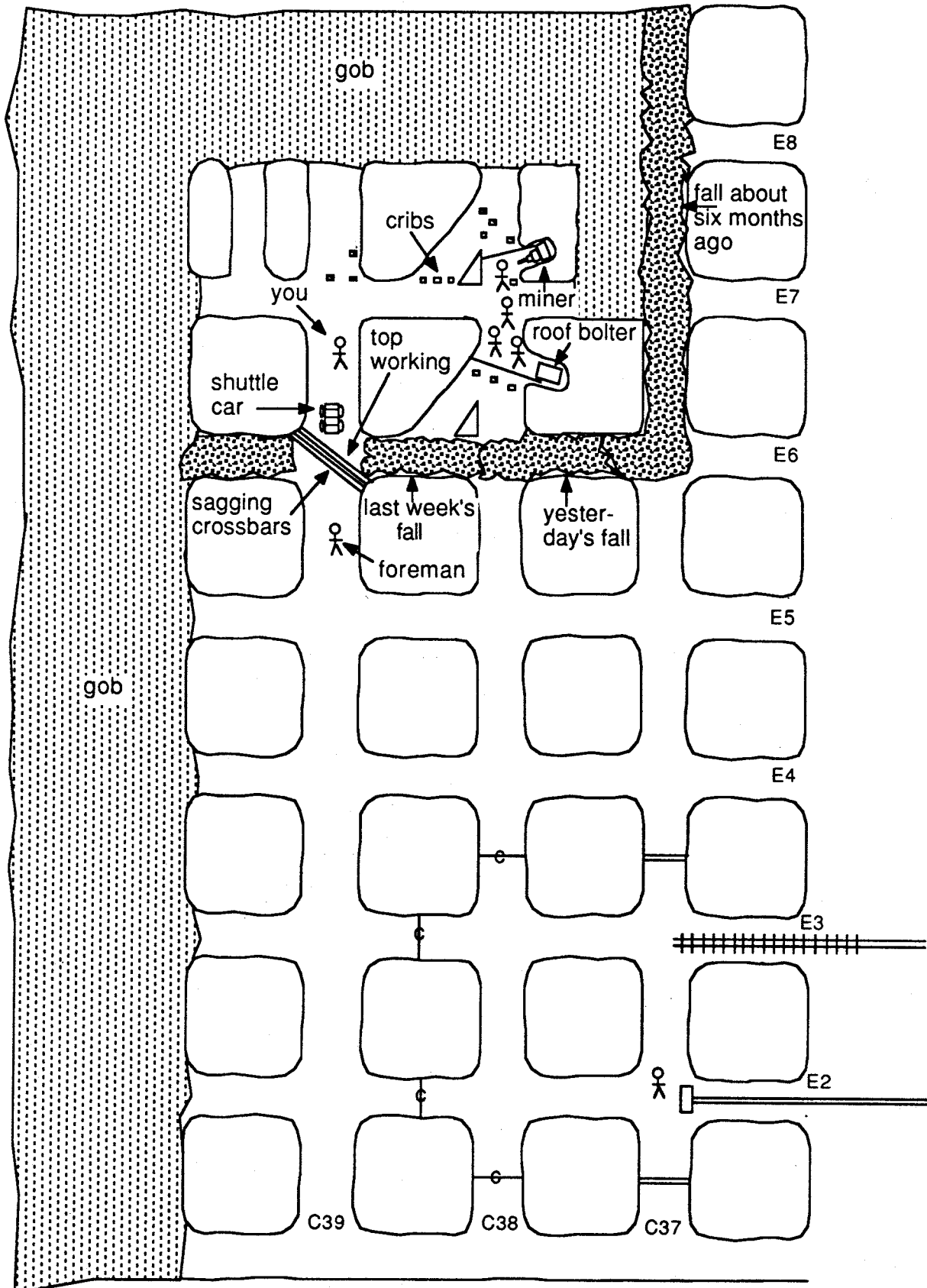


Figure 1: Intersection of 6 entry and crosscut 39

**Question A**

As you and the other miners are coming out, a fall occurs at the intersection of #6 entry and crosscut 39. (See Figure 2.) The fall has blocked the entire intersection and trapped you and the other miners behind it. You can faintly hear the foreman yelling to you. What should you do? (Select as MANY as you think are correct.)

1. Check to see if the other four miners with you are OK.
2. Yell back to the foreman.
3. Split up and go look for another way out.
4. Try to move the fall so that you can escape before your air runs out.
5. Sit quietly and wait to be rescued.
6. Check the top.

**When you have made your selection(s), do the next question.**

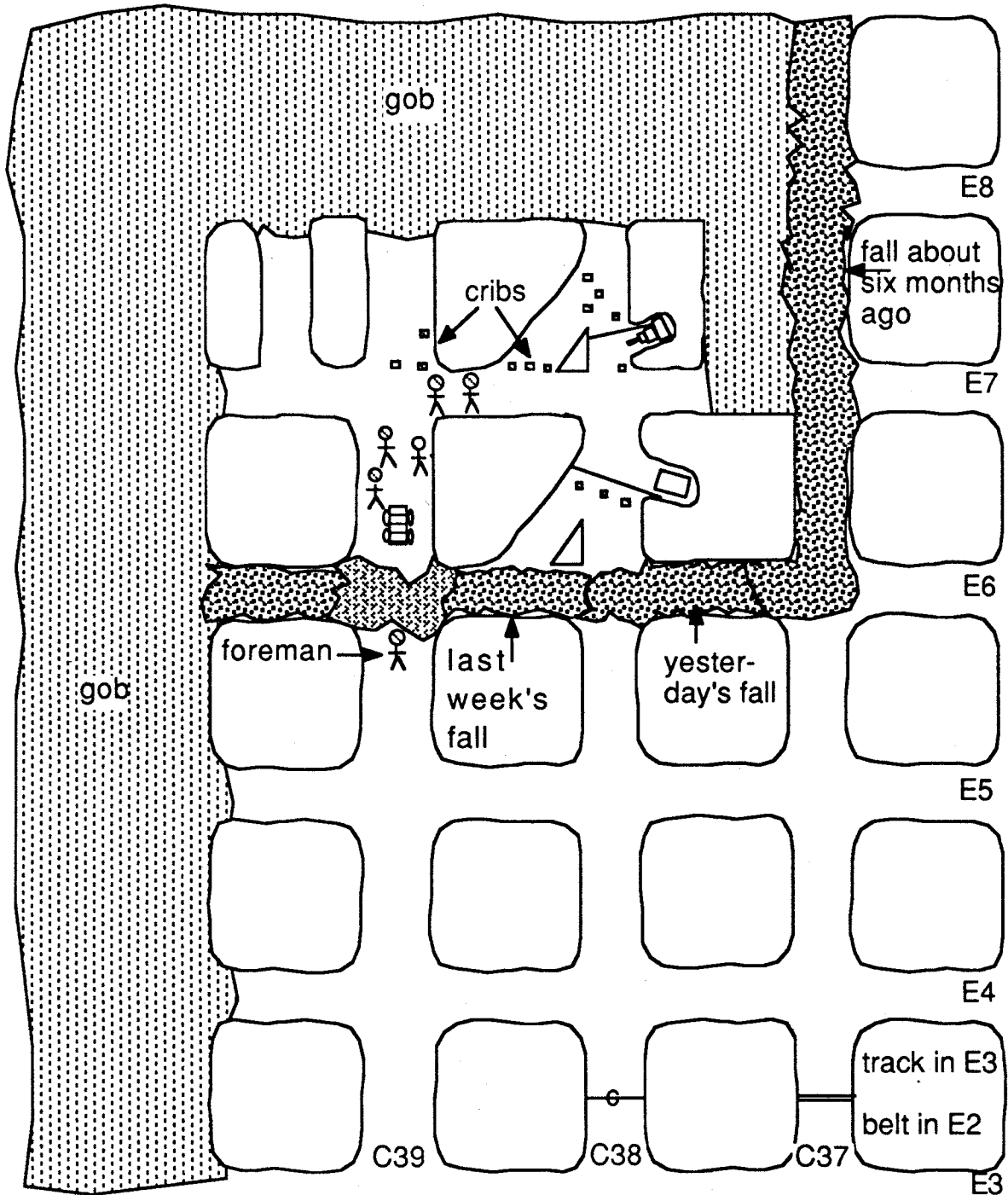


Figure 2: Roof fall in intersection of #6 entry and crosscut 39

**Question B**

You and the other four miners talk about the situation and come up with some ideas about what you should do. Which is the best idea? (Choose only ONE unless you are told to "Try again!")

7. Mac wants to climb over the fall to see if he can get out.
8. The timberman, Slim, wants to stay in one place and start supporting the top.
9. Ann wants to start up the miner and cut through the fall.
10. Jimmy goes up to the fall and tries to move the rock. He keeps saying over and over again, "We gotta move the fall. We gotta get out of here." You should use timbers to support the top near Jimmy so he doesn't get hurt.

**Question C**

You and Slim convince Ann and Mac the you should stay in the safest place, support the top, and wait for rescue. You have managed to quiet Jimmy. He is sitting slumped against the rib, moaning and shaking. Jimmy looks at you as you tell him the groups decision, by the does not respond. You decide to put up extra timbers to support the top to make a safe place to wait. Which position, in Figure 3, would be the safest? (Choose only ONE unless you are told to "Try again!")

11. Position A because it was bolted last.
12. Position B because there is more support for the top here than elsewhere.
13. Some of you should stay inby the new fall at position C while others go inby yesterday's fall at position D. This way you can hear rescue attempts from either direction.
14. position E, because the newly installed cribs will support the roof.

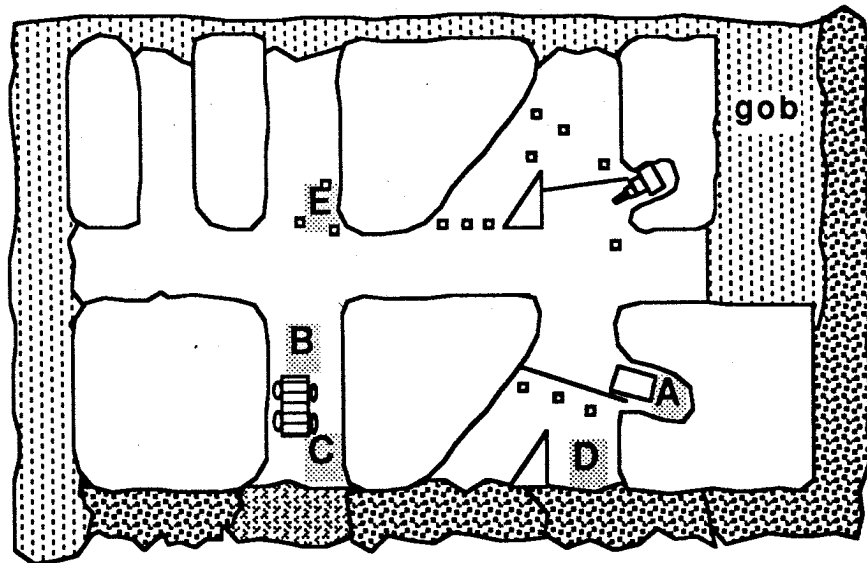


Figure 3: Possible positions of safety

**Question D**

After thinking about your options, you set additional roof supports and wait for rescue at position B. (See Figure 3.) What should you do while you wait? (Choose only ONE unless you are told to "Try again!")

15. Send one or two people at a time to remove as much of the fall as they can while staying under supported top.
16. Sit quietly to conserve your air.
17. Stay together under the extra support you put up. Talk to each other, being sure to include Jimmy in the conversation.
18. Signal to the miners outby the fall by banging on a roof bolt with a timber.

**Question E**

When the fall first occurred and trapped you and your buddies, the foreman yelled to you. You yelled back and said you and the others were OK. What should the foreman have done next? (Choose only ONE unless you are told to "Try again!")

19. Gone to another section to get help.
20. Phoned outside and reported the roof fall.
21. Supported the roof near the fall.
22. Started to remove the rock to rescue the miners.

**Question F**

Immediately after the fall, the foreman called outside and reported the details and asked for assistance. He said the top looked bad. While he was at the phone, he also sent the beltman to another section to get help. What should the foreman have done next? (Choose only ONE unless you are told to "Try again!")

- 23. Gone back to the fall area and waited for help to arrive.
- 24. Gone back to the fall and started removing rock from the intersection.
- 25. Gone back to the fall, gathered materials, talked to the trapped miners, and started supporting the roof outby the fall.
- 26. Gone to yesterday's fall to see if any of the miners were inby that fall.
- 27. Gone back to the fall, gathered roof support materials, talked with the trapped miners, and developed a plan.



**Question G**

While the foreman gathers roof support materials outby the fall, he yells to you that help is on the way. You yell back that you are all OK. You and the other miners are waiting at position B where you have set extra timbers around yourselves. (See Figure 3.) Now you hear and see a second fall on top of the first one. The fall extends about three feet further up crosscut 39 toward your position. You immediately yell to the foreman, but there is no response. What should you do now? (Choose only ONE unless you are told to "Try again!")

- 28. Start digging your way out before it all comes down.
- 29. Go to yesterday's fall at position D. Yell and see if anyone can hear you through the fall.
- 30. Stay where you are, under roof support, at position B.
- 31. Leave position B. Move back to position E and get in between the cribs.

**Question H**

You have been trapped for 3 hours. You are waiting at position B with extra timbers set around yourselves. Jimmy has calmed down. Everyone is still feeling OK. You are all breathing comfortably. You hear miners outby the fall working to free you. The sound gets louder and you see a light shine through the top edge of the fall near the right rib. What should you do? (Choose only ONE unless you are told to "Try again!")

32. Have one person go to the hole and check to see if it is possible to crawl through.
33. You and the other trapped miners should go to the fall and make the hole bigger from the inby side of the fall so that you can leave as soon as possible.
34. Pull the timbers around position B where you are waiting and start supporting the top just inby the hole through the fall.
35. Wait at position B until the rescuers have advanced all the way through the fall area and set supports inby the fall. Talk with the rescuers while you wait.

## **Question I**

This exercise is based on an actual case. Fortunately, no one was injured, although the miners were trapped for several hours. The mine management and the miners should not have allowed this dangerous situation to develop. On your answer sheet, list all the unsafe mining practices and violations of state and federal laws that occurred in this problem.

## **End Of Problem**

### **Scoring your performance**

1. Count the total number of responses you colored in that were marked "correct". Write this number in the first blank on the answer sheet.
2. Count the total number of "incorrect" responses you colored in. Subtract this number from 25. Write the difference in the second blank on the answer sheet.
3. The best score is 35. The worst score is 0.

## **Appendix B: Answer Sheet Blanks**

These are the answer sheet blanks. Copies of these blank answer sheets may be duplicated in the normal fashion. However, the answers that are found within the brackets must be printed on these blank answer sheets in invisible ink. These answers are found in Appendix C. If you have the capability to print invisible ink, make copies of the blank answer sheets. Make a master of the answers that appear in Appendix C. Then print the invisible ink on the blank answer sheets, being careful to make sure all pages print and that the appropriate answers line up with the appropriate blanks. The Master Answer Sheet shows all the answers in their proper places.

Most companies and trainers prefer to obtain copies of the preprinted answer sheets from MSHA, National Mine Health & Safety Academy, Dept. of Instructional Materials, 1301 Airport Road, Beaver, WV 25813-9426 phone 304-256-3257, fax 304-256-3368 or email to [lord-mary@msha.gov](mailto:lord-mary@msha.gov).

The exercise is designed to be used in small groups. You will need one answer sheet for each group of 3 to 5 persons in your class. The answer sheets are consumable. You will need a new set for each class.

A developing pen is also needed by each person who marks an answer sheet.

### Answer Sheet for Roof Fall Entrapment

Use this answer sheet to mark your selections. Rub the developing pen gently and smoothly between the brackets. Don't scrub the pen or the message may blur. Be sure to color in the entire message once you make a selection. Otherwise you may not get the information you need.

**Question A** (Select as MANY as you think are correct)

- 1. [ ]
- 2. [ ]
- 3. [ ]
- 4. [ ]  
[ ]
- 5. [ ]
- 6. [ ]  
[ ]

**Question B** (Choose only ONE unless you are told to "Try again!")

- 7. [ ]  
[ ]
- 8. [ ]  
[ ]
- 9. [ ]  
[ ]
- 10. [ ]  
[ ]

**Question C** (Choose only ONE unless directed to "Try again!")

- 11. [ ]
- 12. [ ]  
[ ]
- 13. [ ]  
[ ]
- 14. [ ]  
[ ]

**Question D** (Choose only ONE unless directed to "Try again!")

15. [ ]

16. [ ]  
[ ]

17. [ ]  
[ ]

18. [ ]  
[ ]

**Question E** (Choose only ONE unless directed to "Try again!")

19. [ ]

20. [ ]  
[ ]

21. [ ]

22. [ ]  
[ ]

**Question F** (Choose only ONE unless directed to "Try again!")

23. [ ]

24. [ ]  
[ ]

25. [ ]

26. [ ]

27. [ ]  
[ ]

**Question G** (Choose only ONE unless you are told to "Try again!")

28. [ ]

29. [ ]  
[ ]

30. [ ]

31. [ ]  
[ ]

**Question H** (Choose only ONE unless you are told to "Try again!")

32. [ ]

33. [ ]

34. [ ]  
[ ]

35. [ ]  
[ ]

**Question I**

List all the unsafe mining practices and violations of state and federal laws that occurred in this problem.

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**End Of Problem**

Finding your score

Number of "Correct" answers you colored in = (1) \_\_\_\_\_

25 minus the number of incorrect answers you colored in = (2) \_\_\_\_\_

Add blanks one and two to get your total score = (3) \_\_\_\_\_

Highest possible score = 35

Lowest possible score = 0

### **Appendix C: Invisible ink Answers**

These pages contain the answers that must be printed in the blanks of the answer sheet in Appendix B. These answers are spaced and sequenced correctly so that they exactly match up with the appropriate blanks on the answer sheet blank.

Once the answers have been printed in the answer sheet blanks, the developing pen reveals the formerly invisible printed message.

You may obtain preprinted answer sheets or you may prepare your own copies. To learn more about these options, and to determine how many answer sheets and developing pens you will need, see the introductory section of the Instructor's Copy.



Correct! Everyone says that they are OK.

Correct! You yell to him and can barely hear him say that he will get you out.

You should not split up or leave this area now.

It would be dangerous to try to move the fall. Air is not a major concern at this time.

There are things you should be doing now.

Correct! The top appears to be good nearly all the way up to the E6-C39 intersection. It is still working near the fall.

The top over the fall is not supported and is still working. This would be very dangerous. Try again!

Correct! This should be done as soon as possible in the safest area. Do the next question.

The power to the miner has been cut by the fall. Anyway, this could be dangerous. Try again!

You should try to calm Jimmy and keep him away from the fall area. Try again!

This area is inside an incomplete pillar. It is not safe. Try again!

Correct! This is the safest place because it is between the two most complete pillars. Do the next question.

Position C is not safe. The incomplete pillars make this area unstable. Try again!

The split pillar on the left, and the cut pillar on the right, make this area unstable. Try again!

This is dangerous. The top is still working near the fall. Try again!

Air would not be a major concern in this large an area. There is something else you should be doing. Try again!

Correct! You need to stay under the extra support. The top is weak. Jimmy is upset. You should keep an eye on him. Do the next question.

Pounding the top could possibly cause another fall. The top is weak. Anyway, the others know where you are. Try again!

There is something else he should have done first. Try again!

Correct! He should have immediately called for help and equipment, including first aid supplies. Do the next question.

He should have done something else. Try again!

This is dangerous. He might have been killed and been of no help to the others. Try again!

There is something else he should have done. Try again!

This is dangerous. Try again!

This is risky. Try again!

The help he sent for will arrive at today's fall. Try again!

Correct! It is wise to plan, gather materials, talk to the trapped miners, and not try to support the bad top until help arrives. Do the next question.

This is not safe. Try again!

This area is not safe. Anyway, help is on the way to position B. The foreman has told the others where you are. Try again!

Correct! Soon you hear rock being moved. Do the next question.

This is dangerous. There is less pillar support at position E than at position B. Try again!

This is dangerous. Try again!

This is dangerous. Try again!

You should not remove these timbers. The falls may have made this area unstable. Try again!

Correct! You should stay at position B until the way out is made safe. It is important to talk with the rescuers while you wait. Do the next question.