

## **Problem on Dragline 1**

### **Problem Booklet**

## **Instructions**

Read the problem situation described on the next page. Then study Figure 1. Next answer each of the 7 questions. Do them one at a time. Don't jump ahead but you may look back to earlier questions and your answers.

After you have selected a choice to a question look up the number for that choice on the answer sheet. Select your answer to the questions by rubbing the developing pen between the brackets on the answer sheet. A hidden message will appear and tell you if you are right or wrong and why. The best score is obtained by selecting the one correct answer for each question. However, if you select a wrong answer, try again. This will help you learn the correct answer to each question. When you finish you will learn how to score your performance.

## **Background**

You are the operator of Dragline #1 at a surface mine.

Spock is a qualified mine electrician.

Joe is an electrician but new to this mine. He can do electrical work only under the supervision of Spock.

Both Spock and Joe have rubber boots on and both have rubber "hot" gloves, and a "hot" stick with them.

Both have the usual electricians' tools including tags and locks.

All their equipment is in good condition.

It has been raining. The mine site is wet.

Spock's utility truck is equipped with a two way radio.

Dragline #1 is operated by an electrical cable with 7,200 volts.

The cable electrical power disconnects are 1500 feet from the dragline.

## **Problem**

Dragline #1 has been losing power. After making some checks, you report damage to the trailing cable. The damage is about 100 feet from the machine. You are waiting for the cable to be repaired by a qualified electrician. An electrician, Spock, and his helper, Joe, come to troubleshoot. They determine that the cable is in need of repair. It was damaged by a bulldozer working in the area.

Study the map on the next page. Then turn the page and answer the first question.

disconnects at power line poles  
(1500 ft. from dragline)

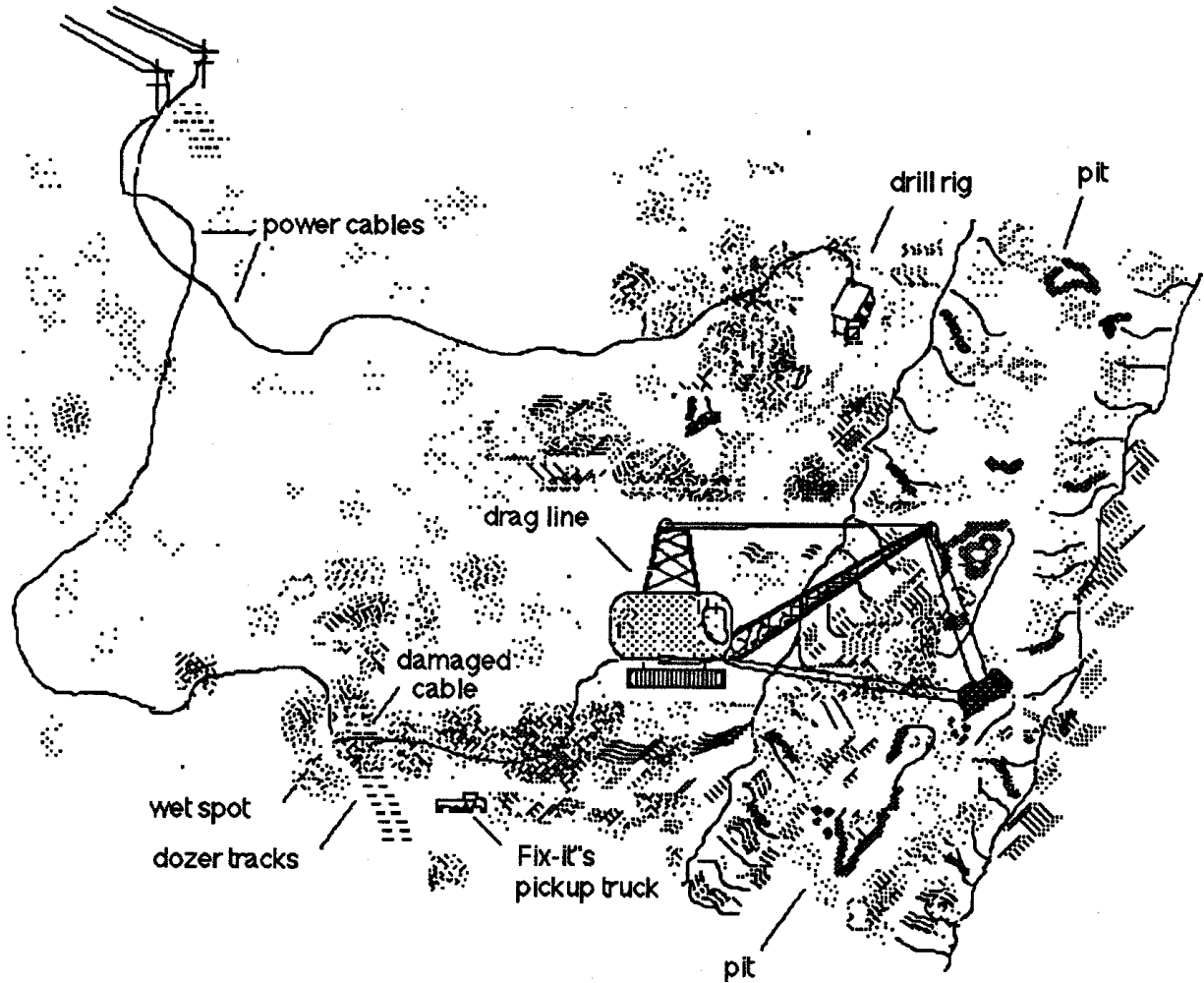


Figure 1: Position of equipment at the surface mine (not to scale)

**Question A**

What is the first thing that Spock should check before making the splice in the cable?  
(Choose only ONE unless you are told to "Try again!")

1. Water in the area
2. Exact location of the splice
3. Joe's qualifications to do electrical work
4. Personal protective equipment
5. Power on the cable

**Question B**

Spock decides to splice the cable. He sends Joe to cut the power. What should you do? (Choose only ONE unless you are told to "Try again!")

6. Nothing, it isn't your job.
7. Tell Spock that he should trace the cable back, lock it out, and tag it himself.
8. Go with Joe to be sure that he disconnects the correct cable.
9. Offer to do it yourself. It's your machine and you're just standing around anyway.

**Question C**

Joe returns and tells Spock that the cable had already been disconnected when he got to the disconnects. What should Spock do now? (Choose only ONE unless you are told to "Try again!")

10. Send Joe to find out who pulled the disconnects.
11. Go ahead and splice the cable.
12. Go to the disconnects and add his lock.
13. Send you to the disconnects to see if the cable is disconnected properly.

**Question D**

Spock accepts Joe's word that the disconnects are pulled on the proper cable. What is the first thing Spock should do now? (Choose only ONE unless you are told to "Try again!")

14. Ask you (the operator) to check to see if there is power to the dragline.
15. Go ahead and cut into the cable to make the splice.
16. Send Joe to the truck for a voltage tester.
17. Remember that someone else pulled the disconnects, and that this same person could re-energize the circuit at anytime.



**Question E**

Spock is in a hurry to finish this job. His hot stick and rubber gloves are in his pickup truck. Before you can do anything, Spock drops to his knees and cuts into the cable. He immediately jerks and then slumps to the ground, with his arms and upper body across the cable. Joe immediately runs off yelling that Spock is hurt. Joe's rubber gloves are on his belt. You yell to Joe to come back, but he keeps going. What is the first thing you should do? (Choose only ONE unless you are told to "Try again!")

18. Take the pickup truck and go cut the power at the disconnects.
19. Immediately grab the cable and pull it away from Spock.
20. Grab a hot stick and Spock's gloves from the truck and use them to move him away from the cable.
21. Look around for a timber or a board and use it to push Spock away from the cable.

**Question F**

Using the hot stick and rubber gloves you are able to move Spock about 5 feet from the cable. Then, using the gloves you drag him another 20 feet away from the cable. When you kneel by him you find there is no stray current. Now, what is the first thing you should do? (Choose only ONE unless you are told to "Try again!")

22. Jump in the pickup truck and go cut the power at the disconnects.
23. Cover Spock with a coat to keep him warm.
24. Use the pickup truck radio to call for help.
25. Check Spock's hands and arms for burns.
26. Check Spock's breathing.

### Question G

You administer a few breaths mouth to mouth. Soon Spock starts breathing again. As you examine Spock for other injuries, you find he is in shock and has serious electrical burns on his hands and arms. Then Joe comes back. What is the first thing you should tell him to do? (Choose only ONE unless you are told to "Try again!")

- 27. "Stay out of the way! You've caused enough trouble!"
- 28. "Go and cut the power!"
- 29. "Go to the pickup truck and radio for help!"
- 30. "Go and find a supervisor to report the accident!"

### 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 23. Write the difference in the second blank on the answer sheet.
3. To find your score, add the numbers in blanks one and two.

The best possible score is 30.

The worst possible score is 0.