

# **Prep Plant Belt Problem**

## **Problem Booklet**

## **Instructions**

Read the problem situation described on the next page. Study Figure 1 on page 4 until you understand the location of the equipment in the problem. Next, answer each of the 13 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 choose 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 answers 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**

You are working with Carl T. Donaldson at the Pine Tree Coal Company #5 prep plant.

You and Carl are doing maintenance on the dryer and loadout belts.

It is 8:45 P.M.

The prep plant processes both steam and metallurgical coal. The two belts cross one another at the thermal dryer.

Both belts are reversible and can dump coal at the clean coal stockpiles, or load coal into unit train railroad cars.

Both belts are elevated and on the same level.

Both belts are equipped with emergency stop pull cords.

The belt control panels for both belts are located on a platform at the thermal dryer. (See Figure 1.)

There is a pager and a first aid kit on the platform at the thermal dryer.

There is an outside telephone in the control room on the 5th level.

You are trained in basic first aid, but are not an EMT.

## **Problem**

You and Carl have just finished washing the dust out of a collection cyclone onto the met product belt. You have started up the met product belt to load the water and fines into an empty railroad car. You're in a hurry to get the job done so the prep plant will be ready to run at 10:00 P. M.

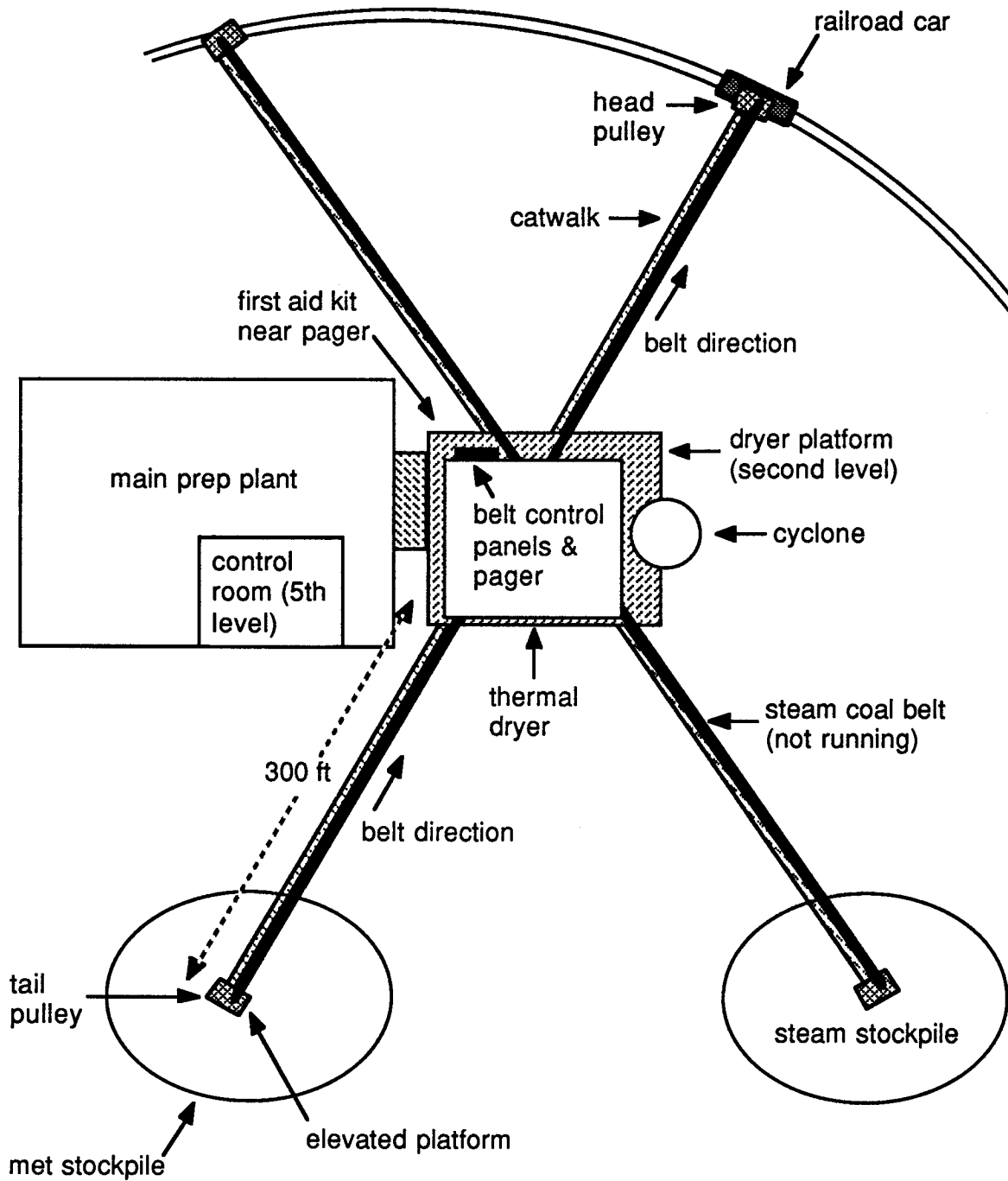


Figure 1: Detail of prep plant thermal dryer and elevated loadout belts

**Question A**

As you run the met product belt, you notice it is misaligned. What should you do?  
(Choose only ONE unless you are told to "Try Again!")

1. Don't worry about it. It will probably straighten out.
2. Walk the belt and look for the problem.
3. Shut the belt down and wait until the foreman comes.
4. Start adjusting the top structure to realign the belt.

**Question B**

You and Carl decide to split up and look for the cause of the misalignment. Carl walks along the catwalk toward the head pulley at the railroad loadout while you walk the other way toward the stockpile. When you get to the tail pulley, you find wet coal stuck to the right side of the roller. There is a lot of fine coal on the platform under the pulley. The belt is running. What should you do now? (Choose only ONE unless you are told to "Try Again!")

5. Using your 12 inch screwdriver, carefully reach around the guard and scrape the wet coal off the roller.
6. Go back to the belt control panel at the thermal dryer. Shut down the belt drive, and lock-out and tag the switch.
7. Remove the guard near the pulley and take a closer look while being careful to stay away from the belt and pulley.
8. Yank the emergency stop pull cord to stop the belt. Then crawl behind the guard and scrape off the wet coal.

### Question C

You decide to go to the belt control panel and lock out and tag the belt drive. Half way there Carl comes to meet you. You tell him you are going to lock out the belt so you can clean the roller. Carl says, "Don't bother! I can fix it easy!" Then he walks off toward the tail pulley. What would you do now? (Choose only ONE unless you are told to "Try Again!")

9. Ask him what he is going to do.
10. Tell him, "O.K. Anything to save time!"
11. Sit down and take a break while he takes care of it.
12. Tell Carl he is a fool.

**Question D**

You tell Carl to wait until you shut down the belt, but he goes off to the tailpiece, saying he knows how to fix the problem real quick. You follow him back so you can warn him not to take chances. When he gets to the tailpiece, Carl stands on the right side of the belt just before the guard. Then he picks up a shovel and starts reaching in, pitching some fine wet coal on the bottom of the belt on the left side. He says this will put coal on the left side of the roller and line up the belt. What problems could Carl's action create? (Select as MANY as you think are correct.)

- 13. It could damage the belt.
- 14. If the shovel gets caught between the belt and roller either Carl or you could be struck by the shovel or pieces of the shovel.
- 15. No serious problems are likely and this will realign the belt.
- 16. Carl could become entangled in the belt.

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



### Question E

You tell Carl to wait while you go back to the control panel to knock the power to the belt. As you leave you look back. Carl has the shovel in his left hand. He is reaching around the guard with the shovel trying to scrape coal off the right side of the roller. Before you can do anything, you hear a thump and the shovel comes flying by your head. You see Carl scrunched up between the right side of the tail pulley roller and the side and bottom of the guard. His face is pushed against the guard looking out. His eyes are open, his mouth is moving, and his face is bloody. (See Figures 2 and 3 on the next page.)

What would you do now? (Choose only ONE unless you are told to "Try Again!")

17. Run and get help.
18. Run back to Carl. Try to reach inside the guard and pull him out.
19. Start removing the guard so you can free Carl.
20. Yank the emergency stop pull cord.

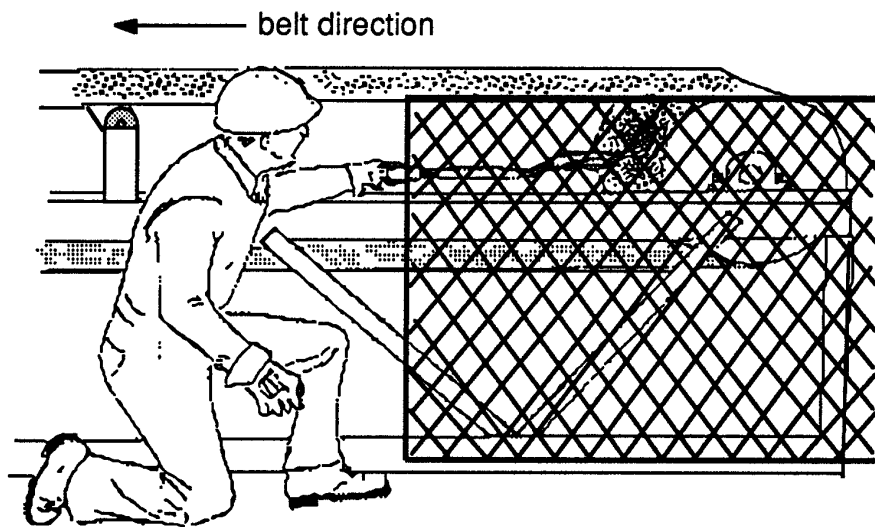


Figure 2: Carl reaches around the guard to scrape the tail pulley with a shovel

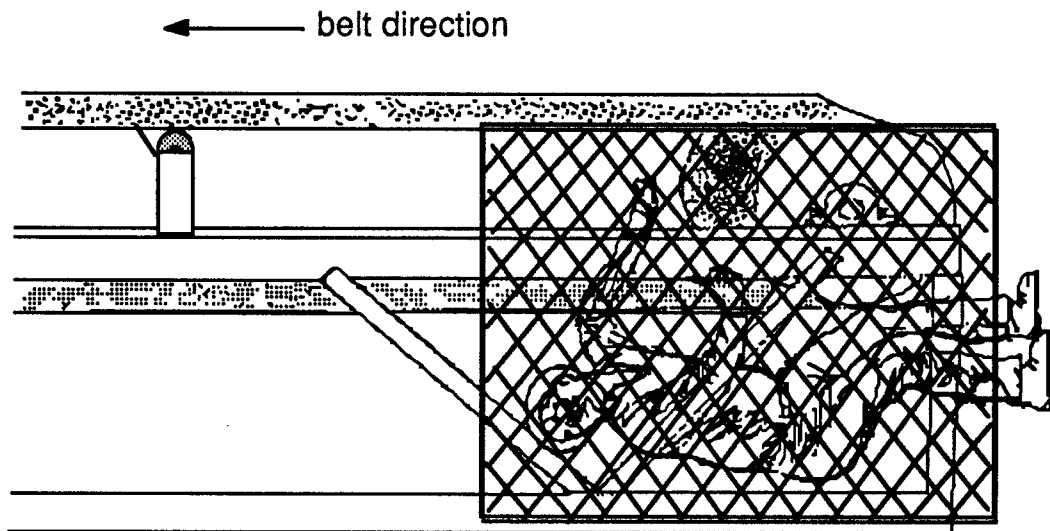


Figure 3: Carl trapped between the guard and moving belt and pulley

**Question F**

You are scared. Carl is still stuck between the guard and the tail pulley. The belt is running. No one else is around. Now what would you do? (Choose only ONE unless you are told to "Try Again!")

21. Go to Carl and comfort him. Tell him you are going to get help. Then go.
22. Stay with Carl, comfort him, and wait for help.
23. Run back to the dryer and the control panel and cut the power to the belt drive.
24. Immediately run and look for someone to help you rescue Carl.

**Question G**

It takes you about half a minute to run to the belt control panel. You yell for help all the way there, but no one responds. You quickly cut the power to the met product belt. Now what should you do? (Select as MANY as you think are correct.)

- 25. Lock out the belt starter.
- 26. Grab the first aid kit and get back to Carl immediately.
- 27. Immediately call for help on the pager. Then grab the first aid kit and get back to Carl.
- 28. Immediately go to the prep plant control room on the 5th level and call for an ambulance.
- 29. Go look for the foreman or someone else who can help you take care of Carl.

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

## Question H

You take the first aid kit and run back to Carl, hoping someone heard you calling for help on the pager. When you get back you find Carl is free. He is lying on the platform on his left side just to the right side of the belt and the guard. His left arm is deformed and crooked and sticking out to his side. The left side of his face is smashed and bleeding heavily. He is not moving and appears to be unconscious. What should you do for Carl now? (Choose only ONE unless you are told to "Try Again!")

30. Immediately begin checking him for other injuries.
31. Move him away from the belt to a safer position.
32. Cover him with your jacket to keep him warm.
33. Use dressings from the first aid kit to apply firm direct pressure to his head wounds to stop his bleeding.
34. Check his breathing.

**Question I**

When you check Carl's breathing, you find his mouth is filled with blood and other matter. He is making gurgling sounds and having trouble breathing. The skin on his uninjured right hand is bluish color. What would you do now? (Choose only ONE unless you are told to "Try Again!")

- 35. Immediately begin mouth to mouth resuscitation.
- 36. Without moving Carl's head, carefully do a finger sweep of his mouth.
- 37. Get behind Carl. Sit him up and lean him over and tell him to spit out.
- 38. Leave and get help. There is nothing more you can do for Carl.

**Question J**

Now Carl is breathing. He is unconscious and doesn't respond to your questions. He is still lying on his left side. Some blood is draining out of his mouth and nose. The skin on his uninjured right hand is getting whiter. There is a large gash on the right side of his temple and cheek. It is bleeding heavily but not squirting blood. What is the one most important thing to do now? (Choose only ONE unless you are told to "Try Again!")

39. Use compresses from the first aid kit to apply gentle but firm direct pressure to the gash on the side of his face.
40. Check Carl for other injuries.
41. Look carefully at Carl's deformed left arm to see if it needs splinting.
42. Cover Carl with your jacket to keep him warm and talk to him to comfort him.

**Question K**

Within a few minutes your direct pressure on Carl's wound stops most of the bleeding. Carl is still unconscious. His breathing is fast but regular. Even though you have been yelling for help, no one has come. What should you do now? (Choose only ONE unless you are told to "Try Again!")

- 43. Leave Carl where he is and go get help.
- 44. Stay with Carl. Keep the direct pressure on his wound and maintain his airway.
- 45. Begin a hands-on survey to check him for other injuries.
- 46. Get the splints and bandages out of the first aid kit and get ready to splint Carl's left arm.



**Question L**

While you are taking care of Carl, the foreman and another miner come. They heard your shouts for help while you were taking care of Carl. The foreman, an EMT, takes charge. He sends the other miner to call an ambulance. What should you do now? (Choose only ONE unless you are told to "Try Again!")

47. Stay with the foreman. Tell him what you saw and what first aid you have given Carl.
48. Ask the other miner to stay and help the foreman while you go call for help.
49. Go get another first aid kit so the foreman will have everything he needs.
50. Go back to the control panel and tag the locked out belt drive switch.

## Question M

Soon an ambulance arrives. Carl was taken to a hospital emergency room. He had serious multiple injuries. The circuit for the belt emergency stop pull cord was found to be bridged out. Carl's recovery required two years.

Now think about this whole exercise. What things could have been done to prevent this accident? (Select as MANY as you think are correct.)

51. Instead of going back to the tail pulley with Carl, his coworker (you) could have continued on toward the control panel and cut the power to the belt.
52. Carl could have used a tool with a longer handle to scrape coal off the tail pulley roller. That way he could stay away from the belt and guard.
53. If a hose were available on the platform, the tail pulley roller could have been washed down with water.
54. Carl and his coworker (you) could have checked the belt emergency stop pull cord before working around the belt.

## 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 36. Write the difference in the second blank on the answer sheet.
3. Add the numbers on the first and second blanks. This is your score.

The best possible score of 54 results from selecting all the correct answers and no wrong answers. The worst possible score of zero results from selecting all the wrong answers and no correct answers.