

Study Guide for Power Plant Mechanic A

Test No. 2752

**HR/Performance Assessment Services
Southern California Edison Company**

REV 0309

The **Power Plant Mechanic A** test is a job knowledge test designed to cover the major knowledge's necessary to perform the job. This *Guide* contains strategies to use for taking tests and a study outline, which includes knowledge categories, major job activities, and study references.

Test Scheduling

Employees who apply for positions, bids, and transfers requiring testing before March 9, 2009, will be scheduled for testing by their Supervisor through Human Resources. For those who apply after March 9, 2009, both the employee and their Supervisor will be notified of a scheduled test date by Human Resources. Test times and dates for positions requiring testing will be specified in the bid/transfer/requisition/job posting. Employees should be prepared to test on the specified dates. Only employees who apply for positions requiring testing, and who meet basic qualifications, will be invited to test. Applicants will be scheduled through the recruiter. If you have any questions, please call 626-302-9830.

Test Session

In order to take the test, you will need to show a picture ID (driver's license or some other identification with a photo). Please be sure to bring this with you.

It is important that you follow the directions of the Test Administrator *exactly*. If you have any questions about the testing session, be sure to ask the Test Administrator before the testing begins. During testing, you may not leave the room, talk, smoke, eat, or drink. Since some tests take several hours, you should consider these factors before the test begins.

All questions on this test are multiple-choice with four possible answers. Prior to March 9, 2009, your answers to the questions are indicated by filling in a circle on an answer sheet with a special mark-sense pencil. For your answers to be read accurately by the scanner, you must fill in the circles completely and erase completely any answer you wish to change. After March 9, 2009 you will take the exam on a computer. For more information on this, please see the next section of this study guide, Computer Based Testing.

The test has a 3 hour (180 minute) time limit.

You will receive a Test Comment form so that you can make comments about test questions. Write any comments you have and turn it in with your test when you are done.

Study Guide Feedback

At the end of this *Guide* you have been provided with a Study Guide Feedback page. If a procedure or policy has changed, making any part of this *Guide* incorrect, your feedback would be appreciated so that corrections can be made.

Computer Based Testing

Effective **March 9, 2009**, all knowledge tests will be administered on the computer. This information will help prepare you for a knowledge test taken on or after **March 9, 2009**.

Taking an SCE knowledge test on the computer is simple. You do not need any computer experience or typing skills. You will only use the keyboard to enter your candidate ID and password. You'll answer all questions by pressing a single button on the mouse.

Log in Screen

You will be seated at a testing station. When you are seated, the computer will prompt you to enter the candidate ID and password you received in your invitation e-mail. You **MUST** have your candidate ID and password or you will be unable to take the test. Once you have confirmed your identity by entering this information, you will see a list of tests available to you.

Sample/Tutorial

Before you start your actual test, a Sample/Tutorial Test is provided to help you become familiar with the computer and the mouse. From the list of exams that appear when you complete the log in, you will select Sample/Tutorial. You will have up to 10 minutes to take the Sample/Tutorial Test. The time you spend on this Sample Test DOES NOT count toward your examination time. Sample questions are included so that you may practice answering questions. In the Sample/Tutorial Test, you will get feedback on your answers. You will not receive feedback on your actual test.

Example

During the test, to answer each question, you should move the mouse pointer over the circle (radio button) next to the answer of your choice, and click the left mouse button. The amount of time you have remaining to take the test will always be shown in the top left corner of the screen. A sample is show below:

1. When you begin the test, you can see the total time allowed for completion displayed at the top of the screen. You can scroll up to see that information at any time during the test.
2. In order to answer each question, first read the question and determine the response that best answers the question. Put the mouse pointer directly over the circle corresponding to that response.

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Time remaining: 29:54

Sample

Please select the best answer for each question below. If you have any comments, please record them on the Test Comments form given to you by the Test Administrator. Good luck!

1 of 13

Two resistors of 20 ohms each are connected in series. The total resistance of the circuit is _____ ohms.

a. 10

b. 20

c. 30

d. 40

3. While the pointer is over the circle corresponding to the best answer, click the left mouse button.



Click the left button when the pointer icon is over your answer choice.

4. The answer you selected should now have a green dot in the circle. If you need to select an alternate answer, simply move the pointer over that circle, and click again.



Time remaining:

Sample

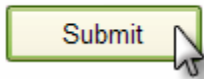
Please select the best answer for each question below. If you have any comments, please record them on the Test Comments form given to you by the Test Administrator. Good luck!

1 of 13

Two resistors of 20 ohms each are connected in series. The total resistance of the circuit is _____ ohms.

- a. 10
- b. 20
- c. 30
- d. 40

5. You can change your answers at any time during the test until the time runs out, or you click the "Submit" button.



Test Taking Strategies

The **Power Plant Mechanic A** test contains multiple-choice questions. The purpose of this section is to help you to identify some special features of a multiple-choice test and to suggest techniques for you to use when taking one.

Your emotional and physical state during the test may determine whether you are prepared to do your best. The following list provides common sense techniques you can use before the test begins.

Technique	Remarks
<i>Be confident</i>	<ul style="list-style-type: none">• If you feel confident about passing the test, you may lose some of your anxiety.• Think of the test as a way of demonstrating how much you know, the skills you can apply, the problems you can solve, and your good judgment capabilities.
<i>Be punctual</i>	<ul style="list-style-type: none">• Arrive early enough to feel relaxed and comfortable before the test begins.
<i>Concentrate</i>	<ul style="list-style-type: none">• Try to block out all distractions and concentrate only on the test. You will not only finish faster but you will reduce your chances of making careless mistakes.• If possible, select a seat away from others who might be distracting.• If lighting in the room is poor, sit under a light fixture.• If the test room becomes noisy or there are other distractions or irregularities, mention them to the Test Administrator <i>immediately</i>.

Budget your time

- Pace yourself carefully to ensure that you will have enough time to complete all items and review your answers.

Read critically

- Read all directions and questions carefully.

Even though the first or second answer choice looks good, be sure to read all the choices before selecting your answer.

Make educated guesses

- Make an educated guess if you do not know the answer or if you are unsure of it.

Changing answers

- If you need to change an answer, be sure to erase your previous answer completely. On the computer, be sure that the new answer is selected instead of the old one.

Return to difficult questions

- If particular questions seem difficult to understand, make a note of them, continue with the test and return to them later.

Double check mathematical calculations

- Use scratch paper to double check your mathematical calculations.

Review

- If time permits, review your answers.
- Do the questions you skipped previously.
- Make sure each answer bubble is *completely* filled in. Erase any stray marks on your answer sheet. When testing on the computer, make sure each question has a green dot next to the correct answer.

Remember the techniques described in this section are only suggestions. You should follow the test taking methods that work best for you.

Study Guide Outline

Job Knowledge Categories

Below are the major job knowledge's categories that are covered on the test.

A. Basic Math and Print Reading

Basic math required for coal handling equipment operation₁ including addition, subtraction, multiplication, division, decimals, ratios, units of measurement and conversions, and basic geometry (circumferences, radius). knowledge of schematic symbols (welding and joining symbols) and mechanical blueprints (assembly drawings and detail drawings), layout plans and specifications used to maintain and repair piping and other equipment.

B. Metallurgy and Welding

Principals of metallurgy, including 'basic definitions, properties of metals, identification of metals and heat treatments. Knowledge of general welding techniques and safety practices. How to perform oxyacetylene and electric arc welding, including safety, equipment setup and use, and cutting procedures. How to perform braze welding, including safety, filler metals and fluxes, joint design and procedures. Knowledge of shielded metal-arc welding principles, including safety, equipment setup, electrode identification.

C. Machine Shop Practices, Tools and Precision Measurement Readings

Knowledge of the basic principles of machining, layout work and shop safety, including the use of small lathes, light milling machine, radial drills and small surface grinders. How to perform basic turning operations, including milling, turning and grinding in order to maintain and repair centrifuges, rotors and pulverizers. How to use basic hand and power tools (e.g., impact and end wrenches, drill motors, screw guns, sockets and ratchets, etc.). How to measure using Vernier calipers, outside, inside and depth micrometers and dial indicators, and other precision instruments in order to assemble/disassemble and inspect coal handling equipment. How to lift, transport and move material and equipment using standard rigging techniques and motorized and non-motorized aids (e.g., forklifts, overhead cranes, hoists, slings, chainfalls, etc.).

D. Adjustment and Repair Procedures for Pulverizers and Associated Coal Processing.

Knowledge of the procedures used to inspect, dismantle, repair, reassemble, adjust and check centrifuges, pulverizers, piping and other types of coal handling equipment. Knowledge of the probable causes of equipment malfunctions.

Job Activity Groups

Below are the major job activity groups that are covered on the test. The study references are guides and may not include all the material covered on the test.

ACTIVITY GROUP 1 - PERFORMS GENERAL WELDING AND BRAZING OPERATIONS.

The Power Plant Mechanic A performs arc and oxyacetylene welding on pulverizers, centrifuges, and related parts, as well as arc welding on coal pipes. The employee assists with preparation of equipment and parts for welding involving the cutting, heating, and grinding of materials.

ACTIVITY GROUP 2- INSPECTS, OVERHAULS, REPAIRS, AND CONDUCTS MAINTENANCE ON PULVERIZERS, CENTRIFUGES, AND OTHER TYPES OF POWER PLANT MECHANIC EQUIPMENT.

The Power Plant Mechanic A uses precision measuring instruments to check clearances and/or tolerances, to layout work, to establish reference points for inspection purposes, assembling, disassembling, repairing, and assembling of coal-handling equipment, and when aligning and adjusting parts, components, and equipment according to required specifications. The employee performs overhauling, cleaning, and repairing of pulverizers and centrifuges at the generating station job site, including coal piping, ribbon conveyors, oil systems, blast gates, gear boxes (e.g., centrifuge gear boxes). The employee conducts the initial inspection of all of the coal-handling equipment and piping. The employee inspects and troubleshoots pulverizers, centrifuges, and associated auxiliary parts and components.

ACTIVITY GROUP 3- PERFORMS GENERAL MAINTENANCE AND REPAIRS OF TOOLS, MACHINERY, AND EQUIPMENT.

The Power Plant Mechanic A performs maintenance of centrifuges, pulverizers, and other types of Power Plant Mechanic equipment. The employee is also responsible for preventive maintenance on machinery and equipment.

ACTIVITY GROUP 4- LIFTS, TRANSPORTS, RIGGS, AND MOVES MATERIAL AND EQUIPMENT.

The Power Plant Mechanic A uses various types of lifting equipment and/or rigging to assemble/disassemble parts, components, or pieces of equipment. The employee also uses non-motorized moving aids, forklift trucks, and other vehicles to transport and load/unload equipment and materials.

ACTIVITY GROUP 5- AS DIRECTED, ASSISTS THE JOURNEYMAN POWERPLANT MECHANIC IN READING AND INTERPRETING WORK PROCEDURES AND TECHNICAL INFORMATION.

The Power Plant Mechanic A reads and interprets reference materials, blueprints, and other technical written materials in order to make and repair parts and equipment. The employee also uses sketches and diagrams to machine or assemble parts.

Study References

Below is a combined listing of the study references and/or study areas for material covered on the test. The materials listed in this Guide are available from general company references (e.g. ESM, APM, etc.), department references, public/university libraries, general bookstores, university or technical bookstores.

KNOWLEDGE CATEGORY A - BASIC MATH AND PRINT READING

Screw Conveyor Repair

Rotor Assembly

KNOWLEDGE CATEGORY B - METALLURGY AND WELDING

Hobart Institute of Welding Technology

Modern Welding, by Althouse/Turnquist/Bowditch, Chapters 1, 2, 11, 16, 24 & 25

KNOWLEDGE CATEGORY C - MACHINE SHOP PRACTICES, TOOLS AND PRECISION MEASUREMENT READINGS

Shop Theory, by Anderson/Tatro, Chapters 2, 4, 7, 8, 14, and 15

Machine Tool Operator, Machine Tool Practices, Section H, Units 1 & 2

Centrifuge Maintenance Install Rotating Element

Worm Shaft Replacement

Conveyor Assembly

Shell Balance Assembly, Join Assembly

Ribbon Thrust Bearing, MTP MM-6000, 3.10

Gearbox Repair - Introduction, 2-1 Machine Specs.

Screw Conveyor Repair

KNOWLEDGE CATEGORY D - ADJUSTMENT AND REPAIR PROCEDURES FOR PULVERIZERS AND ASSOC. COAL PROCESSING

Farval "Installation", "Centralized Lubricating Systems", and "Fittings and Accessories", C-E Manual, Vol 2, Section 22.

"Instruction for Installation and Operation of Cleveland Worm & Gear Reduction Units", C-E Manual, Vol 2, Section 23.

GE "Induction Motors", C-E Manual, Vol 2, Section 24.

"C-E Pulverized Coal System", C-E Manual, Vol 1, Section 9.

"Instructions for the Installation Operation & Maintenance of C-E Bowl Mills C&E Manual, Vol 1, Section 10.

Rigging Standards Manual.

Coal Cake, Centrifuge Technology/Separation Technology Book

Coal Cake Moisture and Particle Sample Training Program

Mill and Centrifuge Function, CE Manual, Volume 3

Scaffolding, Scaffold Training Institute

Steam Cleaner Operation - Manual MTP No. U-5010

Rotor Assembly/Disassembly

Centrifuge Component Repair

 Gearbox Repair - Introduction, 5-1

 Gearbox Repair - Gearbox, 14-3

Auxiliary Component Repair

 Filtrate Pump - MTP MM-6017, p. 2, step 2.23

 Ribbon Thrust Bearing, MTP MM-6000 3.2, 3.17

Mill Wash and Inspect

Mill Components

Component Recondition

Hazard Communication

Centrifuge Maintenance

Mill Scraper Area

Mill Piping and Components

Centrifuge Maintenance Base Repairs

Sample Questions

The following are samples of the type of questions, arranged by knowledge area, that you will encounter in this test. They include a reference for each question to show you the appropriate section to study. An answer page follows the questions.

- 1. Which of the following may not be used to clean precision tools?**
 - a. Solvent
 - b. Rags
 - c. Oil
 - d. Air

- 2. Portable electrical tools that are not double insulated must be grounded:**
 - a. to the nearest station ground.
 - b. by a third conductor in the power supply cord.
 - c. to the nearest metal object.
 - d. through a DC plug in the power supply cord.

- 3. To determine if the pulverizer worm and worm gear are meshing properly, you would use:**
 - a. feeler gauges.
 - b. dial indicators.
 - c. Prussian bluing.
 - d. micrometers.

- 4. The phrase "to countersink" refers to:**
 - a. drilling the holes from the opposite side.
 - b. setting the head of a screw at or below the surface.
 - c. turning the head of a screw in a clockwise direction.
 - d. turning the head of a screw in a counterclockwise direction.

5. Which of the following pneumatic tools is best suited for removing rust, paint scale, and weld spatter from irregular surface?

- a. Needle scaler
- b. Tamper
- c. Digger
- d. Drill

6. When rigging a load, turn buckles are used to:

- a. lengthen or shorten rigging cables.
- b. buckle the rigger safely to a moving load.
- c. secure heavy loads to the guide lines.
- d. compensate for the use of reduced load cables.

Answers to Sample Questions

The following are answers to the sample questions on the previous pages.

1. D
2. B
3. C
4. B
5. A
6. A

Study Guide Feedback

Please use this page to notify us of any changes in policies, procedures, or materials affecting this guide. Once completed, return to:

Southern California Edison
Performance Assessment Services
GO4 - Ground Floor
8631 Rush St.
Rosemead, CA 91770

Power Plant Mechanic A

Test No: 2752

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