



Study Guide
For
Field Hydrographer
2449 Knowledge Test
4709 Performance Test

Human Resources
Talent Planning and Programs
Southern California Edison
An Edison International Company

090415

Introduction

The purpose of this study guide is to assist test takers in preparation for the Field Hydrographer tests. There are two tests for the Field Hydrographer position: a Knowledge Test and Performance Test. You must successfully pass the knowledge test before taking the performance test. This Guide contains strategies to use for taking these tests and a study outline, which includes knowledge categories, major job activities, and study references.

2449 Field Hydrographer Knowledge Test

The 2449 Field Hydrographer knowledge test is a computerized, job knowledge test designed to cover the major knowledge areas necessary to perform the job of a Field Hydrographer.

Test Session

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 cellular/mobile phones, pagers or other electronic equipment will NOT be allowed in the testing area.

All questions on this test are multiple-choice or hot spot questions. Multiple choice questions have four possible answers. Hot spot questions have a picture, and you must click the correct spot on the picture to answer the question. All knowledge tests will be taken on the computer. For more information on this, please see the next section of this study guide on *Computer Based Testing*.

The test has a three hour 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

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, you may see several different types of items. Many of the questions will be multiple choice items. A few items will be pictures, where you'll have to click the spot on the picture that answers the question. Those picture questions are known as "Hot Spot" questions. More information on each type is below.

Overall Test Information

- 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.
- You can change your answers at any time during the test until the time runs out, or you click the "Submit" button. Once you click Submit, you can not change your answers.

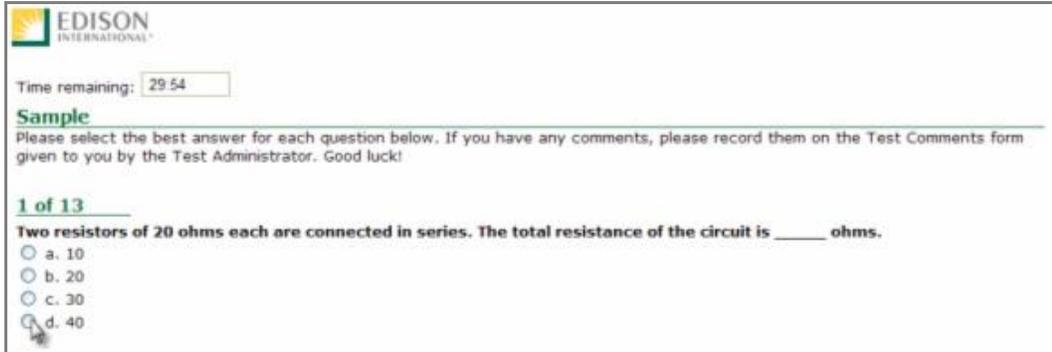


Multiple Choice Questions

To answer each multiple choice 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.

A sample is shown below:

1. 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

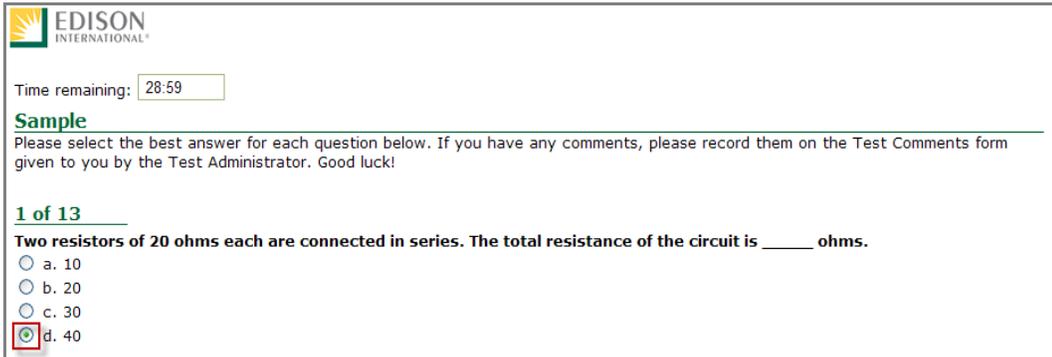
d. 40

2. 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.

3. 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.



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Time remaining: 28:59

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

Hot Spot Questions

To answer each Hot Spot question, you should move the mouse pointer over the part of the image that best answers the question, and click the left mouse button. You will see a pointer appear in that spot. If you want to change your answer, simply move the mouse pointer to a new area on the picture and click again. The pointer will move to the new spot.

A sample is shown below:

1. In order to answer each question, first read the question and determine the place on the image that best answers the question. The pointer that will indicate your answer can always be seen in the bottom left of the image. It looks like this:



Put the mouse pointer directly over the spot on the image you want to select, and click the left mouse button.

1 of 8

On the screen below, where would you click to find out how much vacation time you have left?

About Me



Welcome to the "About Me" section

"About Me" has information about your benefits, programs that help you in your work and/or home life and more. Click on the links below to access the various areas.

Pointer starts out at the bottom left of the image.

About Me Map

 Overview An Overview of what's contained in this section of the Portal	 Career & Jobs Find out about career information and opportunities at Edison International.
 Pay Find information about base pay, job descriptions, Results Sharing, and recognition awards here.	 Time & Attendance Use this section to complete and submit your timesheet for approval, or to view your time-off balances and time

Place the mouse pointer on the spot you want to select, then click on the left button.

2. The pointer will move from the bottom left of the image and appear over the spot you selected.

1 of 8

On the screen below, where would you click to find out how much vacation time you have left?

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The pointer now appears over the correct answer.

3. To change your answer, simply move the mouse pointer to the new spot, and click again. The pointer graphic will move to the new spot you've selected. In order for your answer to be considered correct, the center of the pointer (•) must be over the correct spot on the graphic.

Test Taking Strategies

Introduction

The **2409 Field Hydrographer knowledge test** contains multiple-choice questions and may also contain hot spot 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 immediately.
<i>Budget your times</i>	<ul style="list-style-type: none"> - Pace yourself carefully to ensure that you will have enough time to complete all items and review your answers.
<i>Read critically</i>	<ul style="list-style-type: none"> - 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.
<i>Make educated guesses</i>	<ul style="list-style-type: none"> - 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 math 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 multiple choice 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.

Job Knowledge Categories and Study References

Below are the major job knowledge areas (topics) covered on the 2449 Field Hydrographer knowledge test. Listed next to each knowledge category is the number of items on the exam that will measure that topic. You can use this information to guide your studying. Some exams also contain additional pretest items. Pretest items will appear just like all of the other items on your exam, but they will not affect your score. They are an essential part of ensuring the 2449 Field Hydrographer knowledge test remains relevant to successful performance of the job.

There are a total of 43 items on the 2449 Field Hydrographer knowledge test and the passing score is 70%.

A. Hydrography (24 items)

Knowledge of: hydrographic theory, ability to compute and interpret hydrographic charts; snow surveying and other hydrographic data collection methods.

B. Hydrographic/Meteorological Equipment and Tools (9 items)

Knowledge of: basic hydrographic equipment (flow metering devices, weirs, flumes, levels, venturi meters, micrometers, gages, etc.); meteorological equipment such as precipitation gages, temperature gages, snow survey equipment and tools. Knowledge of basic surveying principles and techniques. Knowledge of the safety procedures when working with hydrographic and meteorological equipment and tools.

C. Applied Math (1 item)

Ability to calculate flow discharge.

D. Electrical, Electronic and Mechanical Knowledge (9 items)

Knowledge of: basic electrical theory, basic electronic theory, AC/DC principles and applications, the maintenance and repair of hydrographic equipment, such as data loggers, precipitation gages, gaging stations, etc. Knowledge of: basic mechanical principles, the operation and maintenance of weather stations, gaging sites, etc, Knowledge of the use of basic tools and equipment, safe work practices when working with mechanical, electrical and electronic equipment.

Sample Questions

The following sample questions should give you some idea of the form the test will take.

1. Solve the following polynomial expression: $(x + 9)(x + 8) =$
2. Factor the following polynomial expression: $2x^2 + 11x + 15 =$
3. Solve for x in the following rational expression: $3x+5=20 =$
4. Reduce to lowest term assuming no denominator is zero: $4x+6 = 14$
5. Columbus weights are streamlined in order to:
 - a. minimize resistance of flowing water.
 - b. stabilize the tag line.
 - c. minimize the resistance of wind.
 - d. break through ice that is over a flume.
6. A 6 Volt battery can be used in a _____ Volt system if not connected in series.
 - a. 6
 - b. 8
 - c. 12
 - d. 24

Sample Question Answers

1. $x^2 + 17x + 72$

2. $(x + 3)(2x + 5)$

3. $x = 5$

4. $2x + 3$

5. a

6. a

4409 Field Hydrographer Performance Test

Introduction

The 4409 Field Hydrographer Performance test is designed to measure individuals' ability to perform tasks commonly performed by Field Hydrographers. During the performance test, you will perform activities similar to those by a Field Hydrographer.

Test Session

The Field Hydrographer Work Sample Test is comprised of four parts:

Part 1: A paper and pencil math portion where you will solve math problems commonly faced by Field Hydrographers (e.g. fractions, decimals, polynomial expressions, ratios, etc.)

Part 2: A portion that requires you to use several hydrographic charts, maps, and diagrams to answer questions.

Parts 3&4: A portion that requires you to analyze various types of hydrographical data using Microsoft Excel and Word (such as developing rating curves and graphs).

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 cellular/mobile phones, pagers or other electronic equipment will NOT be allowed in the testing area.

Timing

You will be given 7 hours to complete the 4709 Field Hydrographer Performance Test. You will have three hours to complete parts one and two. You will receive a break, in accordance with your union contract, after you have completed part two. Afterwards, you will be given three and half hours to complete parts three and four.

Test Materials

You will be provided with all of the materials necessary to complete the performance test. A scientific calculator will be provided for you to use during the test. The calculator provided during the test session will be one of these models:

- Casio fx-250HC,
- Texas Instruments TI-30XA,
- Texas Instruments TI-36X

You will NOT be able to bring or use your own calculator during testing.

Study References

Below are a list of references you may wish to review in preparation for taking the 2449 and 4709 Field Hydrographer tests.

You may use the following links to access a web based training program provided by the United States Geological Survey. This program covers: surface-water field methods, wading discharge measurements, and state-discharge relations.

- <http://training.usgs.gov/TEL/Nolan/SWProcedures/Index.html>.

Other study links:

- California Cooperative Snow Surveys
<http://cdec.water.ca.gov/cgi-progs/products/SnowSurveyProcedureManualv20141027.pdf>
- Water Measurement Manual
<http://www.usbr.gov/tsc/hydlab/pubs/wmm/>
- Measurement and computation of stream flow, Volume 1 (chapters 1-5)
http://pubs.usgs.gov/wsp/wsp2175/pdf/WSP2175_vol1a.pdf
- Measurement and computation of stream flow, volume 2 (chapter 10)
http://pubs.usgs.gov/wsp/wsp2175/pdf/chapter10_vol2.pdf
- Computation of Water-Surface Profiles in Open Channels
<http://pubs.usgs.gov/twri/twri3-a15/html/pdf.html>
- Discharge Measurements at Gaging Stations
<http://pubs.usgs.gov/tm/tm3-a8/>
- State Measurement at Gaging Stations
<http://pubs.usgs.gov/tm/tm3-a7/pdf/tm3-a7.pdf>

Additional references:

Brater, King, and Lindell. Handbook of Hydraulics. McGraw-Hill Education, 1996.

Leupold and Stevens. Stevens Water Resources Data Book. Stevens, 6th edition.

U.S. Bureau of Naval Personnel. Basic Electricity. BN Publishing, 2008.

Selby and Slavin. Practical Algebra: A Self Teaching Guide. John Wiley and Sons, 1991.

ADDITIONAL STUDY INFORMATION

Terms used in the Township and Range System of Map Reading:

Section

Basic unit of the system, a square tract of line one mile by one mile containing 640 acres.

Township

36 sections arranged in a 6 by 6 array, measuring 6 miles by 6 miles. Sections are numbered beginning with the northeast-most section, proceeding west to 6, then south along the west edge of the township and to the east.

Range

Assigned to a township by measuring east or west of a Principal Meridian

Range Lines

North to south lines which mark township boundaries

Township Lines

East to west lines which mark township boundaries

Principal Meridian

Reference or beginning point for measuring east or west ranges.

Map of meridians & base lines from the BLM web server

Base line

Reference or beginning point for measuring north or south townships.

Map of meridians & base lines from the BLM web server

How the System Works.

A specific township is identified as being north or south of a particular baseline and east or west of a particular principal meridian. For example, T3N, R1E of the 3rd Principle Meridian is the third township north of the baseline in the first range east of the Third Principle Meridian.

This particular 36 square-mile area is located in southern Illinois.

The land description generally starts with the smallest part of the description and proceeds to the largest definition. For example, SE1/4 of NW1/4 of Section 3, T3N, R1E, 3rd PM would be the southeast quarter of the northwest quarter of section 3 in township 3 north, range 2 east of the 3rd Principle Meridian.

You may find some irregularly shaped townships and sections which result from surveying errors and other difficulties.

Graphical Display of the Federal Township and Range System

Use the following link for a graphical version of the description of township and range explained below.

http://nationalmap.gov/small_scale/a_plss.html

The largest grouping is the township which is named in reference to a Principal Meridian (P.M.) and a Baseline. T2N, R1E refers to Township 2 North (of the Baseline), Range 1 East (of the Principal Meridian).

Within each township are 36 sections, each one mile square. Each section contains 640 acres. The sections are numbered from 1 to 36 in the following order. [Text only display]

Within each section, the land is referred to as half and quarter sections. A one-sixteenth division is called a quarter of a quarter, as in the NW1/4 of the NW1/4. The descriptions are read from the smallest division to the largest.

Within each township are 36 sections, each one mile square. Each section contains 640 acres. The sections are numbered from 1 to 36 in the following order:

6 5 4 3 2 1
7 8 9 10 11 12
18 17 16 12 14 13
19 20 21 22 23 24
30 29 28 27 26 22
31 32 33 34 32 36

Water Measurements

- a. Acre feet for 24 hours = Second feet times 1.9835
- b. Acre feet = $\frac{\text{second feet times hours}}{12.1}$
- c. Acre feet = second feet times hours times .0826
- d. One acre foot = 43.560 cubic feet
- e. One acre foot = 325.900 gallons
- f. One cubic foot = 7.48 gallons
- g. One cubic foot per second = 450 gallons per minute
- h. 1.9835= one cubic foot flow for 24 hours
- i. For every foot of height you gain .434 P.S.I.

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
Human Resources – Talent Planning and Programs
G.O. 5, 1st Floor
1515 Walnut Grove Ave.
Rosemead, CA 91770

Test Name: 2409 Knowledge and 4709 Field Hydrographer Performance Test

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