

## PERFORM TESTING OF ELECTRICAL INSTALLATION

UNIT CODE: ENG/OS/EIT/CR/04/6/A

### UNIT DESCRIPTION

This unit covers the competencies required to carry out inspection and testing of an electrical installation. The inspection and testing work covers identification of types of test, preparation of test equipment, verifying installed fittings, conducting performance tests, recording testing results, generation of reports and issuance of certificates

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b> These describe the key outcomes which make up workplace function.	<b>PERFORMANCE CRITERIA</b> These are assessable statements which specify the required level of performance for each of the elements. <i>(Bold and italicised terms are elaborated in the Range)</i>
1. Identify the test to be carried out	1.1 The installation to be tested is identified 1.2 Test points are identified 1.3 Relevant standards for testing are applied
2. Prepare test equipment	2.1 Appropriate Test equipment are identified 2.2 Test equipment are checked for appropriate specifications and functionality 2.3 Test equipment are prepared and stored for safe and easy access in accordance with established procedure
3. Verify installed fittings	3.1 Visual inspection is carried out 3.2 Fitting points and equipment are identified 3.3 Physical condition of all fittings are verified for safety appropriateness
4. Perform the test	4.1 <b>Test parameters</b> are identified 4.2 Test equipment are assembled 4.3 Test sequence procedure is decided based on the test standards 4.4 Safety precautions are adhered to 4.5 Additional precaution is observed on the installation in hazardous environment as per EHS standard 4.6 Tests are carried out 4.7 Functionality of all devices including protective devices is checked as per the set standards 4.8 Test results are recorded as per agreed format 4.9 Test results are compared with permissible data parameters in data sheets and standards

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	4.10 Test report is compiled and shared with relevant parties
5. Issue certificates	5.1 Test certificate is issued to the relevant parties 5.2 Wiring certificate is issued to the relevant parties

## RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

<b>Variable</b>	<b>Range</b>
Installation may include but is not limited to:	<ul style="list-style-type: none"> <li>• Domestic</li> <li>• Industrial</li> <li>• Commercial</li> <li>• Agriculture/ horticulture</li> <li>• CCTV</li> <li>• Water heater</li> <li>• Security system</li> <li>• Fire alarm and detection system</li> </ul>
Test equipment may include but is not limited to:	<ul style="list-style-type: none"> <li>• Multimeter/AVO meter</li> <li>• Wattmeter</li> <li>• Insulation resistance tester</li> <li>• Loop impedance tester</li> <li>• Earth resistance tester</li> <li>• Clamp meter</li> <li>• Power quality analyser</li> <li>• Infrared camera</li> <li>• Phase sequence meter</li> <li>• Frequency meter</li> <li>• Synchroscope</li> <li>• Tachometer</li> <li>• Tacho generator</li> <li>• Laser meter</li> <li>• Lux meter</li> </ul>

<b>Variable</b>	<b>Range</b>
Visual inspection may include but is not limited to:	<ul style="list-style-type: none"> <li>• Check for:</li> <li>• Firmness of accessories/equipment</li> <li>• Loose connections</li> <li>• Damaged equipment/component</li> <li>• Colour coding</li> </ul>
Fitting points may include but is not limited to:	<ul style="list-style-type: none"> <li>• 4.1 Switches</li> <li>• 4.2 Cables</li> <li>• 4.3</li> <li>• Socket outlets</li> <li>• Switches</li> <li>• Cables</li> <li>• Light fittings</li> <li>• Conduits and cable trays</li> <li>• Trunking</li> <li>• Motors</li> <li>• Power generators</li> <li>• Pumps</li> </ul>
Test parameters may include but is not limited to:	<ul style="list-style-type: none"> <li>• Potential difference between circuits</li> <li>• Power</li> <li>• Resistance</li> <li>• Voltage</li> <li>• Current</li> <li>• Inductance/capacitance</li> <li>• Frequency</li> <li>• Q- factor</li> <li>• Power factor</li> <li>• Harmonics</li> <li>• Speed of rotary equipment</li> </ul>
Tests may include but is not limited to:	<ul style="list-style-type: none"> <li>• Continuity</li> <li>• Insulation resistance</li> <li>• Polarity</li> <li>• Earth electrode resistance</li> <li>• Earth fault loop impedance</li> <li>• Phase sequence</li> </ul>

## REQUIRED KNOWLEDGE AND UNDERSTANDING

The individual needs to demonstrate knowledge and understanding of:

<ul style="list-style-type: none"> <li>• The manufacturer's warranty requirements relating to inspection and testing activities for the electrical installations and related components.</li> </ul>	<ul style="list-style-type: none"> <li>• Workplace procedures for               <ul style="list-style-type: none"> <li>➤ Using test tools and instruments</li> <li>➤ Work place communication;</li> </ul> </li> </ul>
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<ul style="list-style-type: none"> <li>• The manufacturer's warranty requirements relating to inspection and testing activities for the electrical installations and related components.</li> <li>• Legislation and workplace procedures relevant to <ul style="list-style-type: none"> <li>➤ Health and safety;</li> <li>➤ The environment (including waste disposal);</li> <li>➤ Appropriate personal protection equipment (PPE).</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>➤ Time management</li> <li>➤ Tools and equipment management</li> <li>• The importance of documentation and keeping records</li> <li>• The relationship between time and costs.</li> <li>• Performing tests including <ul style="list-style-type: none"> <li>➤ Connection of testing equipment</li> <li>➤ Operation of testing equipment</li> <li>➤ Recording and interpretation of test results</li> </ul> </li> <li>➤ Making recommendations based on test results</li> <li>➤ Compiling test report</li> </ul>
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## FOUNDATION SKILLS

The individual needs to demonstrate the following additional skills:	
<ul style="list-style-type: none"> <li>• Proficient in using test equipment</li> <li>• Time management</li> <li>• Analytical</li> <li>• Faults troubleshooting</li> <li>• Problem solving</li> </ul>	<ul style="list-style-type: none"> <li>• Planning</li> <li>• Decision making</li> <li>• First aid</li> <li>• Report writing</li> </ul>

## EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and understanding and range.

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Applied and adhered to safety procedures</li> <li>1.2 Applied the procedures of testing according to the standard</li> <li>1.3 Obtained and recorded test values accurately</li> <li>1.4 Interpreted the recorded test results</li> </ul>
2. Resource Implications	<p>Resources the same as that of workplace are advised to be applied. Include: Electrical installation tool kit, Multimeter/AVO meter, Wattmeter, Insulation resistance tester, Clamp meter, Phase sequence meter, Frequency meter, Tacho meter etc.</p>
3. Methods of Assessment	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> <li>3.1 Observation</li> <li>3.2 Oral questioning</li> </ul>

	3.3 Written test 3.4 Portfolio of Evidence 3.5 Interview 3.6 Third party report
4. Context of Assessment	Competency may be assessed individually in the actual workplace or through simulated work environment
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

## PERFORM COMMISSIONING OF ELECTRICAL SYSTEMS

**UNIT CODE:** ENG/OS/EIT/CR/05/6/A

### UNIT DESCRIPTION

This unit covers the competencies required for commissioning of electrical installation Systems. Commissioning includes preparation of schedule, formulation of procedures, notification of system readiness, organizing commissioning team, conducting tests, training of users, and issuing of completion certificate(s).

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
<p>These describe the key outcomes which make up workplace function.</p>	<p>These are assessable statements which specify the required level of performance for each of the elements.</p> <p><i>(Bold and italicised terms are elaborated in the Range)</i></p>
<p>1. Prepare commissioning schedule and handover procedure</p>	<p>1.1 <i>Relevant parties</i> are communicated to in accordance with the contract</p> <p>1.2 Commissioning schedule is prepared in consultation with the responsible parties</p> <p>1.3 Handover documents and tools checklists are prepared</p>