



REPUBLIC OF KENYA
NATIONAL OCCUPATIONAL STANDARDS
FOR
ELECTRICAL ENGINEERING TECHNICIAN (POWER OPTION)

KNQF LEVEL: 6

ISCED OCCUPATIONAL STANDARD CODE: 0713 554B



TVET CDACC
P.O BOX 15745-00100
NAIROBI

MAINTAIN ELECTRICAL EQUIPMENT AND SYSTEMS

UNIT CODE: ENG/OS/PO/CR/08/6/B

UNIT DESCRIPTION

This unit covers the competencies required to carry out maintenance in electrical equipment and systems. This includes preparing maintenance schedule, inspecting and testing electrical equipment and systems, preparing list of maintenance tools and equipments, performing maintenance activities, system testing and documenting maintenance records.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
These describe the key outcomes which make up workplace function.	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. Prepare maintenance schedule	1.1 Type of equipment and systems to be maintained are identified 1.2 The maintenance type and scope are defined 1.3 Maintenance checklists is prepared 1.4 Manufacturers manual is referred to 1.5 Maintenance team identified as per areas of speciality 1.6 Tools to be used in maintenance are identified 1.7 Maintenance work plan is developed
2. Inspect and test electrical equipment and system	2.1 Equipment and System are inspected according to the established procedure 2.2 Main isolation points are identified 2.3 Components in the system are identified 2.4 Maintenance activities of schedule are identified and recorded. 2.5 Components and the entire electrical system are tested 2.6 Inspection and tests are performed as per the standard operating procedure
3. Prepare a list of Maintenance tools	3.1 Maintenance tools are identified as per the type of maintenance to be carried out 3.2 List of maintenance tools is prepared as per established procedure

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	<p>3.3 Maintenance tools are checked for specifications and functionality as per their standard operating procedure</p> <p>3.4 Maintenance tools are arranged as per their functions</p>
4. Perform maintenance activities	<p>4.1 Components and defective parts to be replaced/repaired are identified</p> <p>4.2 Cleaning, oiling and tightening of components is performed</p> <p>4.3 Defective components/parts are replaced/repaired as per established procedures</p> <p>4.4 Replaced and repaired components are configured as per the system operation</p> <p>4.5 Maintenance is done in accordance to health safety and other relevant regulations and standards</p> <p>4.6 <i>Waste materials</i> are disposed in accordance in line with EHS regulations</p>
5. Conduct system tests	<p>5.1 Type of tests are identified</p> <p>5.2 Components to be tested are identified</p> <p>5.3 Replaced/repaired components are tested as per the manufacturer's manual.</p> <p>5.4 System tests is performed as per the expected output and results recorded</p>
6. Document Maintenance records	<p>6.1 Document the maintenance checklist as per the standard operating procedure</p> <p>6.2 Cost, current status of the system and recommendations are documented in a report</p> <p>6.3 Maintenance report is filed and submitted to relevant parties</p>

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.

Variable	Range
1. System may include but is not limited to:	<ul style="list-style-type: none">• Security• Power generator• Domestic installations• Industrial installations• Commercial installation• Electrical machines• Automated systems• Solar system• Water heating• CCTV• Power transmission and distribution• Horticulture• IBMS
2. Maintenance type may include but is not limited to:	<ul style="list-style-type: none">• Periodic• Preventive• Breakdown• Ad-hoc
3. Relevant parties may include but is not limited to:	<ul style="list-style-type: none">• Service providers• Client/representatives• Other service providers

Variable	Range
	<ul style="list-style-type: none"> • Security
4. Waste material may include but is not limited to:	<ul style="list-style-type: none"> • Old batteries • Oil • Cable lugs • Tapes • Cable sheaths • Offcuts • Recovered faulty parts • Cable armouries

REQUIRED KNOWLEDGE AND UNDERSTANDING

- The individual needs to demonstrate knowledge and understanding of:
- The manufacturer's warranty requirements relating to maintenance activities for the electrical systems and related components.
- The legal requirements relating to system maintenance
- Legislation and workplace procedures relevant to:
 - Health and safety;
 - The environment (including waste disposal);
 - Appropriate PPE
 - Appropriate bylaws
- Workplace procedures for:
 - recording system maintenance work and any variations from the original specification;
 - Accidents and incidents reporting
 - Reporting of challenges
- The importance of documenting maintenance information.
- The importance of working within agreed timelines and sharing progress reports

- The relationship between time and costs.
- The importance of reporting anticipated delays to relevant parties promptly.
- How to find, interpret and use sources of technical information for scheduled maintenance activities, including on-board diagnostic displays.
- The importance of using the correct sources of technical information.
- How the system operates.
- The operating specifications and tolerances for the different type(s) of systems
- The hazards associated with maintaining electrical Systems
- How to conduct scheduled, routine system maintenance activities using prescribed checklist
- How to record failures and faults
- Conducting system tests

FOUNDATION SKILLS

The individual needs to demonstrate the following foundation skills:

- Communications (verbal and written);
- Proficient in ICT;
- Time management;
- Analytical
- Faults troubleshooting;
- Problem solving;
- Planning;
- Decision making;
- First aid;
- Report writing;

EVIDENCE GUIDE

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

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Applied safety standards 1.2 Prepared maintenance schedule and checklist 1.3 Repaired faulty components on the system 1.4 Documented maintenance records 1.5 Components were cleaned before reinstallation 1.6 Identified the type of maintenance to be carried out 1.7 Prepared a list of maintenance tools to be used
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	<p>1.8 Used appropriate maintenance tools and equipment safely 1.9 Safely conducted system tests 1.10 Demonstrated techniques of maintenance work</p>
2. Resource Implications	<p><i>The following resources must be provided:</i></p> <p>2.1 Stationery 2.2 Test equipment and tools 2.3 Communication equipment 2.4 Service manuals</p>
3. Methods of Assessment	<p>Competency may be assessed through:</p> <p>3.1 Oral questioning 3.2 Practical demonstration 3.3 Observation</p>
4. Context of Assessment	<p>Competency may be assessed</p> <p>4.1 On job 4.2 Off job 4.3 During Industrial Attachment</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>