

Federal Democratic Republic of Ethiopia
OCCUPATIONAL STANDARD



**BASIC HOME/OFFICE
ELECTRICAL/ELECTRONIC
EQUIPMENT SERVICING**



NTQF Level II



*Ministry of Education
May 2011*

Introduction

Ethiopia has embarked on a process of reforming its TVET-System. Within the policies and strategies of the Ethiopian Government, technology transformation – by using international standards and international best practices as the basis, and, adopting, adapting and verifying them in the Ethiopian context – is a pivotal element. TVET is given an important role with regard to technology transfer. The new paradigm in the outcome-based TVET system is the orientation at the current and anticipated future demand of the economy and the labor market.

The Ethiopia Occupational Standards (EOS) is the core element of the Ethiopian National TVET-Strategy and an important factor within the context of the National TVET Qualification Framework (NTQF). They are national Ethiopia standards, which define the occupational requirements and expected outcome related to a specific occupation without taking TVET delivery into account.

This document details the mandatory format, sequencing, wording and layout for the Ethiopia Occupational Standard which comprised of Units of Competence.

A Unit of Competence describes a distinct work activity. It is documented in a standard format that comprises:

- Occupational title, NTQF level
- Unit code
- Unit title
- Unit descriptor
- Elements and Performance criteria
- Variables and Range statement
- Evidence guide

Together all the parts of a Unit of Competence guide the assessor in determining whether the candidate is competent.

The ensuing sections of this EOS document comprise a description of the occupation with all the key components of a Unit of Competence:

- chart with an overview of all Units of Competence for the respective level including the Unit Codes and the Unit Titles
- contents of each Unit of Competence (competence standard)
- occupational map providing the technical and vocational education and training (TVET) providers with information and important requirements to consider when designing training programs for this standards and for the individual, a career path

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UNIT OF COMPETENCE CHART

Occupational Standard: Basic Home/Office Electrical/Electronic Equipment Servicing

Occupational Code: EEL HOS

NTQF Level II

[EEL HOS2 01 0511](#)

Assemble / Disassemble Home/Office Electrical/Electronic Equipment

[EEL HOS2 02 0511](#)

Implement Maintenance Procedures

[EEL HOS2 03 0511](#)

Maintain and Repair Electronically Controlled Domestic Equipment

[EEL HOS2 040511](#)

Maintain and Repair Electronically Controlled Office Equipment

[EEL HOS2 05 0511](#)

Apply Routine Problem Solving Techniques

[EEL HOS2 06 0511](#)

Dismantle and Dispose Home/Office Electrical/Electronic Equipment

[EEL HOS2 07 0511](#)

Carry-out Preventive Maintenance in Home/Office Electrical/Electronic Equipment

[EEL HOS2 08 0511](#)

Participate in Workplace Communication

[EEL HOS2 09 0511](#)

Work in Team Environment

[EEL HOS2 10 0511](#)

Maintain an Effective Relationship with Client/Customers

[EEL HOS2 11 0511](#)

Develop Business Practice

[EEL HOS2 12 1012](#)

Apply Continuous Improvement Processes (Kaizen)

Occupational Standard: Home/Office Electrical/Electronic Equipment Servicing Level II	
Unit Title	Assemble and Disassemble Home/Office Electrical/Electronic Equipment
Unit Code	EEL HOS2 01 0511
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to assemble/ disassemble consumer electronic equipment

Elements	Performance Criteria
1. Prepare product and work station for assemble/ disassemble	<p>1.1 To Assemble /disassemble Consumer Electronic Equipments workplace is prepared in accordance with OH&S policies and procedures</p> <p>1.2 Responsible person is consulted for effective and proper work coordination</p> <p>1.3 Required materials, tools and equipment are prepared and checked in accordance with established procedures</p> <p>1.4 Parts and materials needed to complete the work are prepared and obtained according to requirements</p>
2. Solder/ Desolder components to the board	<p>2.1 Soldering and de-soldering processes are performed in accordance with OH&S policies and procedures</p> <p>2.2 Process is checked according to established standards and requirements</p> <p>2.3 Soldered products are checked in accordance with quality standards</p>
3. Assemble/ disassemble boards	<p>3.1 Assembling and disassembling processes are performed in accordance with OH&S policies and procedures</p> <p>3.2 Process is checked according to established standards and requirements</p> <p>3.3 Assembled /disassembled products are checked in accordance with quality standards</p>
4. Test and inspect assembled products	<p>4.1 Finished products are subjected to final visual inspection and testing in accordance with quality standards, procedures and requirements</p> <p>4.2 Work completion is documented and responsible person is informed in accordance with established procedures</p> <p>4.3 Housekeeping procedures are observed in accordance with 5S discipline and established procedures</p>

Variable	Range
OH&S policies and procedures	<p>Arrangements of an organization or enterprise to meet their legal and ethical obligations of ensuring the workplace is safe and without risk to health. This may include:</p> <ul style="list-style-type: none"> • hazardous and risk assessment mechanisms • implementation of safety regulations • safety training • safety systems incorporating, <ul style="list-style-type: none"> ▪ work clearance procedures ▪ isolation procedures ▪ gas and vapor ▪ monitoring/testing procedures ▪ use of protective equipment and clothing • use of codes of practice <ul style="list-style-type: none"> ▪ Ethiopia electronics code
Consumer Electronic Equipments	<p>Consumer Electronic Equipments may include but not limited to the following:</p> <ul style="list-style-type: none"> • Washing Machines and Driers • Vacuum Cleaners and Polishers • Home Food Processing equipment <ul style="list-style-type: none"> ▪ Pressure and Rice Cooker ▪ Blender, coffee maker ▪ Toaster, waffle maker • Microwave Oven • Electronic Clock • Flat irons and presses • Rechargeable Light • Electronic controlled Light • Security equipment • Remote Control Appliances • Photo copy machine • Fax machine • Printer • Scanner • UPS • PC
Responsible person	<ul style="list-style-type: none"> • Immediate supervisor • Service supervisor/manager
Materials, tools and equipment	<p>The following materials and tools are some of the requirements:</p> <ul style="list-style-type: none"> • soldering iron and desoldering tools

	<ul style="list-style-type: none"> • screwdriver (assorted) • wrenches (assorted) • Allen wrench/key • utility knife/stripper • pliers (assorted) • test jig • ESD-free work bench with mirror
Soldering and de-soldering processes	<ul style="list-style-type: none"> • prepare the materials and equipment needed • Nature of the equipment is identified • Safety rules and procedures are properly implemented • Appropriate soldering/desoldering techniques are used • remove the component on the board • inspect the work • clean the equipment
Assembling and disassembling processes	<ul style="list-style-type: none"> • supplies, materials and equipment preparation • familiarize with the diagram and the product • perform assembly and disassembly • check the assembled and disassembled product

Evidence Guide	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> • Assembled the unit according to specific requirements within timeframe allotted • Applied safety rules and procedures • Used tools and equipment properly • Identified electrical/electronic components and devices and its proper handling • Applied appropriate knowledge and technique on actual assembly

<p>Underpinning Knowledge and Attitudes</p>	<ul style="list-style-type: none"> • Safety <ul style="list-style-type: none"> ▪ Work Safety requirements and economy of materials with durability ▪ Knowledge in 5S application and observation of required timeframe ▪ Knowledge on proper handling and disposal of chemicals • Materials, tools and equipment uses and specifications <ul style="list-style-type: none"> ▪ Identification of hand and power tools ▪ Proper care and use of tools • System and Processes <ul style="list-style-type: none"> ▪ Principles of Electrical Circuits ▪ Identifying and Proper Handling Of Electrical/Electronic Components ▪ Identifying and Proper Handling Of Digital Components ▪ Fundamentals of ESD Handling ▪ Fundamentals of Thru-Hole Assembly ▪ Fundamentals of Surface-Mount Assembly ▪ Theories of Lead-Free Solders ▪ Fundamentals of Soldering Irons ▪ Fundamentals of Cabling And Wiring Harness ▪ Identifying Connectors And Terminators ▪ Theories of PCB Designing & Construction ▪ Fundamentals of soldering and de-soldering • Mensuration/Mathematics <ul style="list-style-type: none"> ▪ Conversion of Units ▪ Applied Mathematics
<p>Underpinning Skills</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> • Assembled the unit according to specific requirements within timeframe allotted • Applied safety rules and procedures • Used tools and equipment properly • Identified electronic components and devices and its proper handling • Applied appropriate knowledge and technique on actual assembly
<p>Resources Implication</p>	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> • Tools and equipment (see range of variables) • Working area/bench • Sufficient lighting and ventilation system • Complete electronic supplies • Assessment rating sheet

	<ul style="list-style-type: none"> • Reporting forms
Assessment Methods	Competence may be assessed through: <ul style="list-style-type: none"> • Demonstration / Observation • Interview / Oral questioning / Written test
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting

Occupational Standard: Home/Office Electrical/Electronic Equipment Servicing Level II	
Unit Title	Implement Maintenance Procedures
Unit Code	EEL HOS2 02 0511
Unit Descriptor	This unit defines the competence required to set up maintenance procedures to maintain the normal operating performance of electrical/electronic equipment

Elements	Performance Criteria
1. Determine best practices for electrical /electronic equipment maintenance	<p>1.1 Equipment to be maintained and implemented processes are identified to ensure future acquisitions of equipment and spare parts</p> <p>1.2 Vendor documentation, peer organizations or research information detailing best practices in equipment and software maintenance are identified to improve system performance and reliability.</p> <p>1.3 Requirements are obtained from user in the area of equipment maintenance and reliability.</p> <p>1.4 Procedures are documented for maintenance based upon best practices.</p>
2. Revise practices, where appropriate	<p>2.1 Maintenance operation is monitored and reviewed where appropriate.</p> <p>2.2 Problem areas including failures are identified to meet service-level agreements, and consider changes to maintenance procedures.</p> <p>2.3 Changes are assessed in consultation with user, support staff and third party suppliers.</p> <p>2.4 Improvements are designed and implemented to maintenance procedures.</p>
3. Identify and analyze electrical /electronic system components to be maintained	<p>3.1 Warranty status of components is determined and documented according to vendor, project or organizational requirements.</p> <p>3.2 System Design and configuration documentation are reviewed for current status.</p> <p>3.3 Critical components are identified and recommendations are documented regarding possible service arrangements.</p>

4. Apply maintenance procedures	<p>4.1 Preventative maintenance schedule is created based on cost, business and service-level agreements requirements</p> <p>4.2 Specific and appropriate maintenance procedure is identified and applied based on cost, business and service-level agreements requirements</p> <p>4.3 Recommended procedures are documented and submitted for approval in accordance with organizational requirements and service-level agreement</p> <p>4.4 Implementing staff are oriented on the procedures and ensured to follow the maintenance schedule</p> <p>4.5 OHS is observed throughout the process</p>
Variable	Range
Equipment	<p>May include but is not limited to workstations,</p> <ul style="list-style-type: none"> • Washing Machines and Driers • Vacuum Cleaners and Polishers • Home Food Processing equipment <ul style="list-style-type: none"> ▪ Pressure and Rice Cooker ▪ Blender, coffee maker ▪ Toaster, waffle maker • Microwave Oven • Electronic Clock • Flat irons and presses • Rechargeable Light • Electronic controlled Light • Security equipment • Remote Control Appliances • Photo copy machine • Fax machine • Printer • Scanner • UPS
System design	May include but is not limited to commercial, equipment factory set program & configuration
Documentation	May follow ISO/IEC/AS standards, audit trails, naming standards, version control, project management templates and report writing, maintaining equipment inventory; client training and satisfaction reports
Requirements	May be in reference to the business, system, application, network or people in the organization

Service-level agreement	May exist for many different infrastructure services, including communications carriers, ISPs, ASPs and SLAs for vendor products, workload and performance considerations, expectations regarding servicing, penalties, and charge back to business units.
Preventive Maintenance Schedule	May include but not limited to, Daily monitoring inspection, proactive maintenance schedule, re-active maintenance schedule
Tools	<ul style="list-style-type: none"> • Hardware and Software • Blower • Cleaning agents (alcohol, contact cleaner) • Tool kit • Static wrist strap • Multi meter • Set of screw drivers • Set of electrical pliers • Set of wrench
Occupational Health and Safety (OHS)	<p>OHS precautions and measures may include against:</p> <ul style="list-style-type: none"> • Physical hazards – impact, illumination, pressure, noise, vibration, temperature, radiation • Chemical hazards – dusts, fibers, mists, fumes, smoke, gasses, vapors • Ergonomics <ul style="list-style-type: none"> ▪ Psychological factors – over exertion/ excessive force, awkward/static positions, fatigue, direct pressure, varying metabolic cycles ▪ Physiological factors – monotony, personal relationship, work out cycle • Burglary, Fire and Power accidents

Evidence Guide	
Critical Aspects of Competence	<p>Assessment must confirm ability to-</p> <ul style="list-style-type: none"> • determine the best practice for electrical/electronic repair and maintenance • Read and interpret equipment manual • Read and interpret electrical/electronic wiring diagram • set up efficient and responsive maintenance procedures to keep equipments normal operation
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> • client business domain • current industry-standard hardware and software products and its features

	<ul style="list-style-type: none"> • equipment maintenance • safety procedures and practices in electrical/electronic maintenance • techniques and procedure in determining system's current functionality • system performance and maintenance procedures • operation and use of diagnostic tools
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> • identify and analyze maintenance needs • analyze electrical/electronic system components to be maintained • determine and apply best practices for equipment and software maintenance • use diagnostic tools
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Assessment Methods	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> • Interview / Written Test / Oral Questioning • Observation / Demonstration
Context of Assessment	Competency may be assessed in the work place or in a simulated work place setting

Occupational Standard: Home/Office Electrical/Electronic Equipment Servicing Level II	
Unit Title	Maintain and Repair Electronically-Controlled Domestic Equipment
Unit Code	EEL HOS2 03 0511
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to maintain and repair electronically controlled domestic appliances equipment. It includes diagnosing faults, dismantling, re-assembling, testing and preparing reports.

Elements	Performance Criteria
1. Prepare unit, tools, equipment and workstation	<ul style="list-style-type: none">1.1 Workplace/equipment is made ready for maintenance1.2 Repair/maintenance history is verified in line with the company procedures1.3 Service manuals and service information required for repair/maintenance are acquired as per standard procedures.1.4 Workplace is set / arrange for repair job in accordance with company standard procedures1.5 Necessary tools, test instruments and personal protective equipment are prepared in line with job requirements
2. Diagnose faults of the unit	<ul style="list-style-type: none">2.1 Complete check-up of electronically-controlled domestic appliances is conducted and defects are identified, verified and documented against customer description2.2 Systematic pre-testing procedure is observed in accordance with manufacturer's instructions2.3 System defect/fault symptoms are identified using appropriate tools and equipment and in accordance with safety procedures2.4 Test instruments required for the job are used in accordance with user manuals and safety procedures2.5 Proper troubleshooting procedures are implemented2.6 Circuits are checked and isolated using specified testing procedures2.7 Identified defects and faults are explained to the responsible person in accordance with enterprise or company policy and procedures2.8 Control settings/adjustments are checked in conformity with service-manual specifications2.9 Results of diagnosis and testing are documented accurately

	<p>and completely within the specified timeframe</p> <p>2.10 Customers are advised/informed regarding the status and serviceability of the unit in accordance with company procedures</p>
3. Maintain/repair the unit	<p>3.1 Personal protective equipments are used in accordance with Occupational Health and Safety practices</p> <p>3.2 Electro-static discharge (ESD) protection procedure is followed in accordance with current industry standards</p> <p>3.3 Defective parts/components are replaced with identical or recommended appropriate equivalent ratings</p> <p>3.4 Repaired or replaced parts/components are soldered/mounted in accordance with the current industry standards</p> <p>3.5 Control settings/adjustments are performed in conformity with service-manual specifications</p> <p>3.6 Repair activity is performed within the required timeframe</p> <p>3.7 Care and extreme precaution in handling the unit/product is observed as per procedures</p> <p>3.8 Cleaning of unit is performed in accordance with standard procedures</p>
4. Test repaired unit	<p>4.1 Repaired units are reassembled according to procedures</p> <p>4.2 Reassembled units are subjected to final testing and cleaning in conformity with manufacturer's specifications</p> <p>4.3 Service completion procedures and documentations are complied with based on manual</p> <p>4.4 Waste materials are disposed of in accordance with environmental requirements</p>

Variable	Range
Domestic appliance equipment	<p>Domestic appliances may include but not limited to the following:</p> <ul style="list-style-type: none"> • Washing Machines and Driers • Vacuum Cleaners and Polishers • Home Food Processing equipment <ul style="list-style-type: none"> ▪ Pressure and Rice Cooker ▪ Blender, coffee maker ▪ Toaster, waffle maker • Microwave Oven • Electronic Clock • Flat irons and presses • Rechargeable Light • Electronic controlled Light • Security equipment • Remote Control Appliances • Air conditioner • Refrigerators

Service manuals	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • Service manual/schematic diagram/parts list • Operating instructions/User's/Owner's manual • Component data sheet/handbook
Service Information	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • job report sheets • job order • bill of materials • customer index • service flowchart • stock and inventory record • requisition slips (for acquisition of parts) • supplier index
Tools, Materials and Test Instruments	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • step-down transformer • soldering iron/gun • screwdriver (assorted) • nut drivers (assorted) • wrenches (assorted) • Allen wrench/key • multi-testers (analog/digital) • Clamp meter • utility knife • wire stripper • pliers (assorted) • work bench • flashlight • test light • cleaning brush • ball peen hammer • soldering lead • wires, various sizes • assorted electronic components • Tweezers • Glue Gun/Stick • Air Compressor • Tie (plastic/metal) • Magnifiers • Refrigerant • Pressure gauge • Evacuator • Flaring tool • Copper tubes • Gas welding equipment
Personal protective equipment	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • working clothes/apron • hand gloves • face/dust mask • goggles • safety shoes

Pre- testing procedures	<ul style="list-style-type: none"> • Visual inspection of the unit with power off • Interview of customer re history of unit • Operate the appliance according to manual to confirm defects
Responsible person	<ul style="list-style-type: none"> • immediate supervisor • service supervisor / manager
OHS requirements in accordance with legislation & regulations	<ul style="list-style-type: none"> • use of proper tools and equipment • observe workplace environment and safety • adherence to safety requirements in handling the unit • use of protective device/shields • Ethiopia Electrical Code
Environmental Requirements	<ul style="list-style-type: none"> • proper disposal of chemicals and components shall be based on existing requirements of the law and chemical waste management • non-biodegradable parts or materials shall be packed and labeled properly for disposal

Evidence Guide

<p>Critical Aspects of Competence</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> • Set/Prepared workplace for repair job in line with the company requirements. • Prepared necessary tools, test instruments and personal protective equipment in line with job requirements • Observed systematic pre-testing procedures in accordance with manufacturer’s instructions • Identified system defects/fault symptoms using appropriate tools and equipment and in accordance with safety procedures • Explained identified defects and faults to the responsible person and customer in accordance with enterprise or company policy and procedures • Replaced defective parts/components with identical or recommended appropriate equivalent ratings • Performed control setting/adjustments in conformity with service manual specifications • Subjected reassembled units to final testing and cleaning in conformity with manufacturer’s specifications
<p>Underpinning Knowledge and Attitudes</p>	<ul style="list-style-type: none"> • Mensuration/Mathematics <ul style="list-style-type: none"> ▪ Conversion of Units ▪ Applied Mathematics • Drawing, Block and Schematic Diagram <ul style="list-style-type: none"> ▪ Reading and interpreting orthographic projections and isometric views ▪ Reading and interpreting electronic schematic diagram, block diagram and symbols

Underpinning Knowledge and Attitudes	<ul style="list-style-type: none"> • Safety <ul style="list-style-type: none"> ▪ Work Safety requirements and economy of materials with durability ▪ Knowledge in 5S application and observation of required procedures • Materials, tools/instruments & equipment uses and specifications <ul style="list-style-type: none"> ▪ identification of hand and power tools ▪ proper care and use of tools ▪ identification of test and measuring instruments ▪ proper care and use of test and measuring instruments • System and processes <ul style="list-style-type: none"> ▪ Principles of Electrical Circuits ▪ Fundamentals of Direct Current Circuits ▪ Fundamentals of Alternating Current Circuits ▪ Fundamentals of Electronic Components And Circuits ▪ Fundamentals of Digital Logic, Components & Circuits ▪ Fundamentals of Microcontroller Circuits And Programming ▪ Analysis of Troubles and Isolation Techniques ▪ Principles of Electronic Controlled Domestic Appliances ▪ Fundamentals of Solenoids, Relays And Motors ▪ Fundamentals of Electronic Motor Controls ▪ Fundamentals of Industrial Devices and Circuits ▪ Fundamentals of Electronic Lighting and Heating Controls ▪ Fundamentals of Remote Control ▪ Fundamentals of Appliance Protection and Safety Circuits ▪ Fundamentals of Magnetrons And Other Heating Devices
Underpinning Skills	<p>Demonstrates skills in:</p> <ul style="list-style-type: none"> • application of troubleshooting technique • use and maintenance of test instruments, tools, & equipment • application of work safety practices and time management • application of substitution technique • soldering/desoldering and wiring/cabling techniques • schematic diagram reading skills
Resources Implication	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> • tools, equipment and test instruments • electronically-controlled domestic appliances • service manuals/schematics • ESD free working area/bench • complete electronic spare parts/supplies

Assessment Methods	Competence may be assessed through: <ul style="list-style-type: none"> • Interview / written test / oral questioning • Observation/Demonstration
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting

Occupational Standard: Home/Office Electrical/Electronic Equipment Servicing Level II	
Unit Title	Maintain and Repair Electronically-Controlled Office Equipment
Unit Code	EEL HOS2 04 0511
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to maintain and repair electronically controlled office equipment. It includes diagnosing faults, dismantling, re-assembling, testing and preparing reports.

Elements	Performance Criteria
1. Prepare unit, tools, equipment and workstation	1.1 Workplace/equipment is made ready for maintenance 1.2 Repair/maintenance history is verified in line with the company procedures 1.3 Service manuals and service information required for repair/maintenance are acquired as per standard procedures. 1.4 Workplace is set / arrange for repair job in accordance with company standard procedures 1.5 Necessary tools , test instruments and personal protective equipment are prepared in line with job requirements
2. Diagnose faults of the unit	2.1 Complete check-up of electronically-controlled and office equipment is conducted and defects are identified, verified and documented against customer description 2.2 Systematic pre-testing procedure is observed in accordance with manufacturer's instructions 2.3 System defect/fault symptoms are identified using appropriate tools and equipment and in accordance with safety procedures 2.4 Test instruments required for the job are used in accordance with user manuals and safety procedures 2.5 Proper troubleshooting procedures are implemented 2.6 Circuits are checked and isolated using specified testing procedures 2.7 Identified defects and faults are explained to the responsible person in accordance with enterprise or company policy and procedures 2.8 Control settings/adjustments are checked in conformity with service-manual specifications 2.9 Results of diagnosis and testing are documented accurately

	<p>and completely within the specified timeframe</p> <p>2.10 Customers are advised/informed regarding the status and serviceability of the unit in accordance with company procedures</p>
3. Maintain/repair the unit	<p>3.1 Personal protective equipments are used in accordance with Occupational Health and Safety practices</p> <p>3.2 Electro-static discharge (ESD) protection procedure is followed in accordance with current industry standards</p> <p>3.3 Defective parts/components are replaced with identical or recommended appropriate equivalent ratings</p> <p>3.4 Repaired or replaced parts/components are soldered/mounted in accordance with the current industry standards</p> <p>3.5 Control settings/adjustments are performed in conformity with service-manual specifications</p> <p>3.6 Repair activity is performed within the required timeframe</p> <p>3.7 Care and extreme precaution in handling the unit/product is observed as per procedures</p> <p>3.8 Cleaning of unit is performed in accordance with standard procedures</p>
4. Test repaired unit	<p>4.1 Repaired units are reassembled according to procedures</p> <p>4.2 Reassembled units are subjected to final testing and cleaning in conformity with manufacturer's specifications</p> <p>4.3 Service completion procedures and documentations are complied with based on manual</p> <p>4.4 Waste materials are disposed of in accordance with environmental requirements</p>

Variable	Range
office equipment	<p>Office Equipment may include but not limited to the following:</p> <ul style="list-style-type: none"> • Photo copy machine (analogue & Digital) • Fax machine • Printer • Scanner • UPS • PC

Service manuals	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • Service manual/schematic diagram/parts list • Operating instructions/User's/Owner's manual • Component data sheet/handbook
Service Information	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • job report sheets • job order • bill of materials • customer index • service flowchart • stock and inventory record • requisition slips (for acquisition of parts) • supplier index
Tools, Materials and Test Instruments	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • step-down transformer • soldering iron/gun • screwdriver (assorted) • nut drivers (assorted) • wrenches (assorted) • Allen wrench/key • multi-testers (analog/digital) • Clamp meter • utility knife • wire stripper • pliers (assorted) • work bench • flashlight • test light • cleaning brush • ball peen hammer • soldering lead • wires, various sizes • assorted electronic components • Tweezers • Glue Gun/Stick • Air Compressor • Tie (plastic/metal) • Toner • Paper • Spare parts for office equipment
Personal protective equipment	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • working clothes/apron • hand gloves • face/dust mask • goggles • safety shoes
Pre- testing procedures	<ul style="list-style-type: none"> • Visual inspection of the unit with power off • Interview of customer re history of unit • Operate the appliance according to manual to confirm defects
Responsible person	<ul style="list-style-type: none"> • immediate supervisor • service supervisor / manager

OHS requirements in accordance with legislation & regulations	<ul style="list-style-type: none"> • use of proper tools and equipment • observe workplace environment and safety • adherence to safety requirements in handling the unit • use of protective device/shields • Ethiopia Electrical Code
Environmental Requirements	<ul style="list-style-type: none"> • proper disposal of chemicals and components shall be based on existing requirements of the law and chemical waste management • non-biodegradable parts or materials shall be packed and labeled properly for disposal

Evidence Guide	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> • Set/Prepared workplace for repair job in line with the company requirements. • Prepared necessary tools, test instruments and personal protective equipment in line with job requirements • Observed systematic pre-testing procedures in accordance with manufacturer's instructions • Identified system defects/fault symptoms using appropriate tools and equipment and in accordance with safety procedures • Explained identified defects and faults to the responsible person and customer in accordance with enterprise or company policy and procedures • Replaced defective parts/components with identical or recommended appropriate equivalent ratings • Performed control setting/adjustments in conformity with service manual specifications • Subjected reassembled units to final testing and cleaning in conformity with manufacturer's specifications
Underpinning Knowledge and Attitudes	<ul style="list-style-type: none"> • Mensuration/Mathematics <ul style="list-style-type: none"> ▪ Conversion of Units ▪ Applied Mathematics • Drawing, Block and Schematic Diagram <ul style="list-style-type: none"> ▪ Reading and interpreting orthographic projections and isometric views ▪ Reading and interpreting electronic schematic diagram, block diagram and symbols

Underpinning Knowledge and Attitudes	<ul style="list-style-type: none"> • Safety <ul style="list-style-type: none"> ▪ Work Safety requirements and economy of materials with durability ▪ Knowledge in 5S application and observation of required procedures • Materials, tools/instruments & equipment uses and specifications <ul style="list-style-type: none"> ▪ identification of hand and power tools ▪ proper care and use of tools ▪ identification of test and measuring instruments ▪ proper care and use of test and measuring instruments • System and processes <ul style="list-style-type: none"> ▪ Principles of Electrical Circuits ▪ Fundamentals of Direct Current Circuits ▪ Fundamentals of Alternating Current Circuits ▪ Fundamentals of Electronic Components And Circuits ▪ Fundamentals of Digital Logic, Components & Circuits ▪ Fundamentals of Microcontroller Circuits And Programming ▪ Analysis of Troubles and Isolation Techniques ▪ Principles of Electronic Controlled Domestic Appliances ▪ Fundamentals of Solenoids, Relays And Motors ▪ Fundamentals of Electronic Motor Controls ▪ Fundamentals of Industrial Devices and Circuits ▪ Fundamentals of Electronic Lighting and Heating Controls ▪ Fundamentals of Remote Control ▪ Fundamentals of Appliance Protection and Safety Circuits ▪ Fundamentals of Magnetrons And Other Heating Devices
Underpinning Skills	<p>Demonstrates skills in:</p> <ul style="list-style-type: none"> • application of troubleshooting technique • use and maintenance of test instruments, tools, & equipment • application of work safety practices and time management • application of substitution technique • soldering/desoldering and wiring/cabling techniques • schematic diagram reading skills
Resources Implication	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> • tools, equipment and test instruments • electronically-controlled domestic appliances • service manuals/schematics • ESD free working area/bench • complete electronic spare parts/supplies

Assessment Methods	Competence may be assessed through: <ul style="list-style-type: none"> • Interview / written test / oral questioning • Observation/Demonstration
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting

Occupational Standard: Home/Office Electrical/Electronic Equipment Servicing Level II	
Unit Title	Apply routine Problem Solving Techniques
Unit Code	EEL HOS2 05 0511
Unit Descriptor	This competency covers the knowledge, skills and attitudes required to apply the process of problem solving and other problems beyond those associated directly with the process unit. It includes the application of structured processes and improvement tools.

Element	Performance Criteria
1. Analyze the problem	1.1. Issues/concerns are evaluated based on data gathered 1.2. Possible causes of problem are identified within the area of responsibility as based on experience and the use of problem solving tools/analytical techniques 1.3. Possible cause statements are developed based on findings
2. Identify possible solutions	2.1. All possible options are considered for resolution of the problem in accordance with safety and operating procedures 2.2. Strengths and weaknesses of possible options are considered 2.3. Corrective action is determined to resolve the problem and its possible future causes
3. Recommend solution to higher management	3.1. Report/ communication or documentation are prepared 3.2. Recommendations are presented to appropriate personnel 3.3. Recommendations are followed-up, if required 3.4. Proposed solutions are experimented
4. Implement solution	4.1. Measurable objectives are identified 4.2. Resource needs are identified 4.3. Timelines are identified in accordance with plan
5. Evaluate/Monitor results and outcome	5.1. Processes and improvements are identified based on evaluative assessment of problem 5.2. Recommendations are prepared and submitted to superiors/supervisors.

Variable	Range		
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Area of responsibility	Variables may include but are limited to: <ul style="list-style-type: none"> • Work environment • Problem solution processes • Preventative maintenance and diagnostic policy • Roles and technical responsibilities
Occupational Health and Safety	As per company statutory and vendor requirements. Economic and environmental factors must be considered during the demonstration of this competency.
Communication	Variables may include but are not limited to: <ul style="list-style-type: none"> • both hand written and printed material • internal memos • electronic mail • briefing notes and • bulletin boards.
Documentation	<ul style="list-style-type: none"> • Audit trails • Naming standards • Version control

Evidence Guide	
Critical aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> • Analysed the problem • Identified possible solutions • Implemented solutions • Recommended solutions to higher management • Outcome evaluated/monitored <p>Evidence of satisfactory performance in this unit can be obtained by observation of performance and questioning to indicate knowledge and understanding of the elements of the competency and performance criteria.</p>

Underpinning Knowledge	<ul style="list-style-type: none"> • Broad understanding of systems, organizational systems and functions • Broad knowledge of help desk and maintenance practices • Current industry accepted hardware and software products with broad and detailed knowledge of its general features and capabilities • Broad knowledge of the operating system • Broad knowledge of the client business domain • Broad knowledge based incorporating current industry practices related to escalation procedures • Broad knowledge based of diagnostic tools • General principles of OHS • Divisional/unit responsibilities
Underpinning Skills	<ul style="list-style-type: none"> • Decision making within a limited range of options. • Communication is clear, precise and varies according to the type of audience • Teamwork in reference to personal responsibility • Time management as applied to self-management. • Analytical skills in relation to routine malfunctions. • General customer service skills displayed. • Questioning and active listening is employed to clarify general information
Method of assessment	<p>The assessor may select at least two of the following assessment methods to objectively assess the candidate:</p> <ul style="list-style-type: none"> • Observation • Questioning • Practical demonstration
Resource implication	<ul style="list-style-type: none"> • Computer hardware with peripherals • Appropriate software
Context of Assessment	Assessment may be conducted in the workplace or in a simulated work environment

Occupational Standard: Home/Office Electrical/Electronic Equipment Servicing Level II	
Unit Title	Dismantle and Dispose Home/Office Electrical/Electronic Equipment
Unit Code	EEL HOS2 06 0511
Unit Descriptor	This unit covers the knowledge, skills and attitudes in dismantling and disposing of Home/Office electrical/electronic equipment

Elements	Performance Criteria
1. Ensure decision for dismantling and disposal	1.1 Equipment is identified for no more service 1.2 Approval for dismantling is obtained from concerned body 1.3 End users are informed about the equipment to be dismantled
2. Plan to dismantle and dispose equipment	2.1 Store house for dismantled equipment is prepared, 2.2 Dismantling schedule is fixed and communicated to end users 2.3 Equipment is decontaminated (if necessary)
3. Organize resources needed	3.1 Work force is organize and work assignments finalized 3.2 Financial resources are insured 3.3 Necessary materials, tools and equipment are prepared
4. Dismantle the equipment	4.1 Equipment is dismantled following correct procedures and OHS measures 4.2 Dismantled parts are marked and labeled 4.3 Parts are cleaned , checked, and readied for packing 4.4 Parts are identified for reuse and disposal and reusable items are packed 4.5 Items to be disposed are identified
5. Dispose the equipment	5.1 Concerned body is consulted and obtained approval for disposal 5.2 Equipment is disposed off following disposal procedures and regulations, 5.3 Disposal report is prepared using approved format 5.4 Equipment is discarded following discarding procedures 5.5 Necessary reports and documentation are accomplished in accordance with the company standard procedures

Variable	Range
No more service	Equipment is obsolete, no spare part available, major damage and not maintainable
Tools and equipment	<p>The following tools and equipment but not limited to are required:</p> <ul style="list-style-type: none"> • different sizes of flat screw drivers • different sizes of Allen keys • adjustable wrench and set of box wrenches • pliers • insulating tape • multimeter • hammer, chisel and knife • hacksaw
OHS	<ul style="list-style-type: none"> • Use proper safety rules • Proper usage of electrical tool and instruments • Use protective equipment / devices
<i>Disposal procedures and regulation</i>	<ul style="list-style-type: none"> • Company disposal policy • National disposal regulations • Disposal procedures

Evidence Guide	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> • Ensured decision for dismantling and disposal • Planned to dismantle and dispose electrical/electronic equipment • Organized resources needed for activities • Dismantled the equipment • Disposed the equipment based on the regulations and report
Underpinning knowledge	Basic Electricity and Electronics, Basic Digital Electronics, Basic General Mechanics, Basic Technical Drawing, Basic optical, Environmental Science, Workshop practice.
Underpinning skill	<ul style="list-style-type: none"> • Ensure decision for dismantling and disposal • Plan to dismantle and dispose electrical/electronic equipment • Organize resources needed for activities • Dismantle the equipment • Dispose the equipment and report

Resource Implication	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> • materials • tools and test equipment/instrument • equipment to be used in a real or simulated situations
Assessment Methods	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> • Interview / Oral Questioning / Written Test • Observation/Demonstration
Context of Assessment	<p>Assessment may be conducted in the workplace or in a simulated environment</p>

Occupational Standard: Home/Office Electrical/Electronic Equipment Servicing Level II	
Unit Title	Carry out preventive maintenance in Home/Office Electrical/ Electronic Equipment
Unit Code	EEL HOS2 07 0511
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to Carry out preventive maintenance in home/office Electrical/ Electronics Equipment.

Elements	Performance Criteria
1 Prepare unit, tools, equipment and workstation for preventive maintenance	1.1 Workplace/equipment is made ready for maintenance 1.2 preventive maintenance history is verified in line with the company procedures 1.3 Service manuals and service information required for preventive maintenance are acquired as per standard procedures. 1.4 Workplace is set / arrange for repair job in accordance with company standard procedures 1.5 Necessary tools, test instruments and personal protective equipment are prepared in line with job requirements
2 Perform preventive maintenance	5.1 External part of the equipment is inspected visually and carefully 5.2 equipment case is opened according to manual 5.3 Internal part of the equipment is freed from dust using blower 5.4 Loose connection is tightened firmly or re-soldered correctly and firmly with cold solder if appropriate 5.5 Moving parts are lubricated in accordance with manufacturer's specifications using appropriate materials and tools 5.6 Mechanical parts are cleaned using appropriate cleaning materials

Variable	Range
equipment	Office Equipment may include but not limited to the following:

	<ul style="list-style-type: none"> • Photo copy machine (analogue & Digital) • Fax machine • Printer • Scanner • UPS • PC
Service manuals	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • Service manual/schematic diagram/parts list • Operating instructions/User's/Owner's manual • Component data sheet/handbook •
Service Information	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • job report sheets • job order • bill of materials • customer index • service flowchart • stock and inventory record • requisition slips (for acquisition of parts) • supplier index
Tools, Materials and Test Instruments	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • step-down transformer • soldering iron/gun • screwdriver (assorted) • nut drivers (assorted) • wrenches (assorted) • Allen wrench/key • multi-testers (analog/digital) • Clamp meter • utility knife • wire stripper • pliers (assorted) • work bench • flashlight • test light • cleaning brush • ball peen hammer • soldering lead • wires, various sizes • assorted electronic components • Tweezers • Glue Gun/Stick • Air Compressor • Cleaning Material • Tie (plastic/metal) • Toner • Paper • Spare parts for office equipment

Personal protective equipment	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • working clothes/apron • hand gloves • face/dust mask • goggles • safety shoes
OHS requirements in accordance with legislation & regulations	<ul style="list-style-type: none"> • use of proper tools and equipment • observe workplace environment and safety • adherence to safety requirements in handling the unit • use of protective device/shields • Ethiopia Electrical Code

Evidence Guide	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> • Set/Prepared workplace for repair job in line with the company requirements. • Prepared necessary tools, test instruments and personal protective equipment in line with job requirements • Performed preventive maintenance with service manual specifications • Subjected reassembled units to final testing and cleaning in conformity with manufacturer's specifications
Underpinning Knowledge and Attitudes	<ul style="list-style-type: none"> • Calculation/Mathematics <ul style="list-style-type: none"> ▪ Conversion of Units ▪ Applied Mathematics • Drawing, Block and Schematic Diagram <ul style="list-style-type: none"> ▪ Reading and interpreting orthographic projections and isometric views ▪ Reading and interpreting electronic schematic diagram, block diagram and symbols

Underpinning Knowledge and Attitudes	<ul style="list-style-type: none"> • Safety <ul style="list-style-type: none"> ▪ Work Safety requirements and economy of materials with durability ▪ Knowledge in 5S application and observation of required procedures • Materials, tools/instruments & equipment uses and specifications <ul style="list-style-type: none"> ▪ identification of hand and power tools ▪ proper care and use of tools ▪ identification of test and measuring instruments ▪ proper care and use of test and measuring instruments
Underpinning Skills	<p>Demonstrates skills in:</p> <ul style="list-style-type: none"> • application of preventive maintenance technique • soldering/desoldering and wiring/cabling techniques • schematic diagram reading skills
Resources Implication	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> • tools, equipment and test instruments • electronically-controlled domestic appliances • service manuals/schematics • ESD free working area/bench
Assessment Methods	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> • Interview / written test / oral questioning • Observation/Demonstration
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting</p>

Occupational Standard: Home/Office Electrical/Electronic Equipment Servicing Level II	
Unit Title	Participate In Workplace Communication
Unit Code	EEL HOS2 08 0511
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace requirements.

Elements	Performance Criteria
1. Obtain and convey workplace information	<ul style="list-style-type: none">1.1 Specific and relevant information is accessed from appropriate sources1.2 Effective questioning , active listening and speaking skills are used to gather and convey information1.3 Appropriate medium is used to transfer information and ideas1.4 Appropriate non- verbal communication is used1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed1.6 Defined workplace procedures for the location and storage of information are used1.7 Personal interaction is carried out clearly and concisely
2. Participate in workplace meetings and discussions	<ul style="list-style-type: none">2.1 Team meetings are attended on time2.2 Own opinions are clearly expressed and those of others are listened to without interruption2.3 Meeting inputs are consistent with the meeting purpose and established protocols2.4 Workplace interactions are conducted in a courteous manner2.5 Questions about simple routine workplace procedures and matters concerning working conditions of employment are asked and responded to2.6 Meetings outcomes are interpreted and implemented

3. Complete relevant work related documents	<p>3.1 Range of forms relating to conditions of employment are completed accurately and legibly</p> <p>3.2 Workplace data is recorded on standard workplace forms and documents</p> <p>3.3 Basic mathematical processes are used for routine calculations</p> <p>3.4 Errors in recording information on forms/ documents are identified and properly acted upon</p> <p>3.5 Reporting requirements to supervisor are completed according to organizational guidelines</p>
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Variable	Range
Appropriate sources	<ul style="list-style-type: none"> • Team members • Suppliers • Trade personnel • Local government • Industry bodies
Medium	<ul style="list-style-type: none"> • Memorandum • Circular • Notice • Information discussion • Follow-up or verbal instructions • Face to face communication
Storage	<ul style="list-style-type: none"> • Manual filing system • Computer-based filing system
Forms	<ul style="list-style-type: none"> • Personnel forms, telephone message forms, safety reports
Workplace interactions	<ul style="list-style-type: none"> • Face to face • Telephone • Electronic and two way radio • Written including electronic, memos, instruction and forms, non-verbal including gestures, signals, signs and diagrams
Protocols	<ul style="list-style-type: none"> • Observing meeting • Compliance with meeting decisions • Obeying meeting instructions

Evidence Guide

Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> • Prepared written communication following standard format of the organization • Accessed information using communication equipment • Made use of relevant terms as an aid to transfer information effectively • Conveyed information effectively adopting the formal or informal communication
Underpinning Knowledge and Attitudes	<ul style="list-style-type: none"> • Effective communication • Different modes of communication • Written communication • Organizational policies • Communication procedures and systems • Technology relevant to the enterprise and the individual's work responsibilities
Underpinning Skills	<ul style="list-style-type: none"> • Follow simple spoken language • Perform routine workplace duties following simple written notices • Participate in workplace meetings and discussions • Complete work related documents • Estimate, calculate and record routine workplace measures • Basic mathematical processes of addition, subtraction, division and multiplication • Ability to relate to people of social range in the workplace • Gather and provide information in response to workplace Requirements
Resource Implications	<ul style="list-style-type: none"> • Fax machine • Telephone • Writing materials • Internet
Assessment Methods	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> • Interview / questioning / written test • Simulation/demonstration • Observation
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting</p>

Occupational Standard: Home/Office Electrical/Electronic Equipment Servicing Level II	
Unit Title	Work In Team Environment
Unit Code	EEL HOS2 09 0511
Unit Descriptor	This unit covers the skills, knowledge and attitudes to identify role and responsibility as a member of a team.

Elements	Performance Criteria
1. Describe team role and scope	<p>1.1 The role and objective of the team is identified from available sources of information</p> <p>1.2 Team parameters, reporting relationships and responsibilities are identified from team discussions and appropriate external sources</p>
2. Identify own role and responsibility within team	<p>2.1 Individual role and responsibilities within the team environment are identified</p> <p>2.2 Roles and responsibility of other team members are identified and recognized</p> <p>2.3 Reporting relationships within team and external to team are identified</p>
3. Work as a team member	<p>3.1 Effective and appropriate forms of communications used and interactions undertaken with team members who contribute to known team activities and objectives</p> <p>3.2 Effective and appropriate contributions made to complement team activities and objectives, based on individual skills and competencies and workplace context</p> <p>3.3 Observed protocols in reporting using standard operating procedures</p> <p>3.4 Contribute to the development of team work plans based on an understanding of team's role and objectives and individual competencies of the members.</p>

Variable	Range
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Role and objective of team	<ul style="list-style-type: none"> • Work activities in a team environment with enterprise or specific sector • Limited discretion, initiative and judgment maybe demonstrated on the job, either individually or in a team environment
Sources of information	<ul style="list-style-type: none"> • Standard operating and/or other workplace procedures • Job procedures • Machine/equipment manufacturer's specifications and instructions • Organizational or external personnel • Client/supplier instructions • Quality standards • OHS and environmental standards
Workplace context	<ul style="list-style-type: none"> • Work procedures and practices • Conditions of work environments • Legislation and industrial agreements • Standard work practice including the storage, safe handling and disposal of chemicals • Safety, environmental, housekeeping and quality guidelines

Evidence Guide	
Critical Aspects of competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> • Operated in a team to complete workplace activity • Worked effectively with others • Conveyed information in written or oral form • Selected and used appropriate workplace language • Followed designated work plan for the job • Reported outcomes
Underpinning Knowledge and Attitude	<ul style="list-style-type: none"> • Communication process • Team structure • Team roles • Group planning and decision making
Underpinning Skills	<ul style="list-style-type: none"> • Communicate appropriately, consistent with the culture of the workplace

Evidence Guide	
Resource Implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> • Access to relevant workplace or appropriately simulated environment where assessment can take place • Materials relevant to the proposed activity or tasks
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> • Observation of the individual member in relation to the work activities of the group • Observation of simulation and or role play involving the participation of individual member to the attainment of organizational goal • Case studies and scenarios as a basis for discussion of issues and strategies in teamwork
Context for Assessment	<ul style="list-style-type: none"> • Competence may be assessed in workplace or in a simulated workplace setting • Assessment shall be observed while task are being undertaken whether individually or in group

Occupational Standard: Home/Office Electrical/Electronic Equipment Servicing Level II	
Unit Title	Maintain an Effective Relationship with Client/Customers
Unit Code	EEL HOS2 10 0511
Unit Descriptor	This unit covers the knowledge, skills and attitudes and values required in building and maintaining an effective relationship with clients, customers and the public.

Elements	Performance Criteria
1. Maintain a clean and hygienic environment	<p>1.1 Uniform and personal grooming maintained to assignment requirements.</p> <p>1.2 Personal presence maintained according to employer standards.</p> <p>1.3 Visible work area kept tidy and uncluttered.</p> <p>1.4 Equipment stored according to assignment requirements.</p>
2. Meet client/customer requirements	<p>2.1 Client requirements identified and understood by referral to the assignment instructions.</p> <p>2.2 Client requirements met according to the assignment instructions.</p> <p>2.3 Changes to client's needs and requirements monitored and appropriate action taken.</p> <p>2.4 All communication with the client or customer is clear and complied with assignment requirements.</p>
3. Work as a team member	<p>1.1 Effective and appropriate forms of communications used and interactions undertaken with team members who contribute to known team activities and objectives</p> <p>1.2 Effective and appropriate contributions made to complement team activities and objectives, based on individual skills and competencies and workplace context</p> <p>1.3 Observed protocols in reporting using standard operating procedures</p> <p>1.4 Contribute to the development of team work plans based on an understanding of team's role and objectives and individual competencies of the members.</p>

4. Build credibility with customers/clients	<p>1.1 Client expectations for reliability, punctuality and appearance adhered to.</p> <p>1.2 Possible causes of client/customer dissatisfaction identified, dealt with recorded according to employer policy.</p> <p>1.3 Client fully informed of all relevant security matters in a timely manner and according to agreed reporting procedures.</p>
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Variable	Range
Personal Presence	May include: <ul style="list-style-type: none"> • Stance • Posture • Body Language • Demeanor • Grooming
Client Requirements	May include: <ul style="list-style-type: none"> • Assignment Instructions • Post Orders • Scope to modify instructions/orders in light of changed situations
Assignment Instructions	May conveyed in: <ul style="list-style-type: none"> • Writing • Verbally • Electronically
Client Needs and Requirements	May be detected by: <ul style="list-style-type: none"> • Review of the client brief and/or assignment instructions Discussion with the client/customer
Appropriate Action	May include: <ul style="list-style-type: none"> • Implementing required changes • Referral to appropriate employer personnel Clarification of client needs and instructions
Customers	May include: All members of the public

Evidence Guide	
Critical aspects of competence	Assessment requires that the candidate: <ul style="list-style-type: none"> • Maintained a professional image. • Interpreted client/customer requirements from information contained in the client brief and/or assignment instructions. • Dealt successfully with a variety of client/customer interactions. • Monitored and acted on changing client or customer needs.

	<ul style="list-style-type: none"> • Met client/customer requirements. • Built credibility with customers/clients
Underpinning Knowledge and Attitude	<ul style="list-style-type: none"> • Uniform and personal grooming requirements of the employer and the client • Occupational health and safety requirement for the assignment • Assignment Instructions
Underpinning Skills	<ul style="list-style-type: none"> • Attention to detail when completing client/employer documentation • Interpersonal and communication skills required in client contact assignments • Customer service skills required to meet client/customer needs • Punctuality • Customer Service • Telephone Technique • Problem Solving and Negotiation • Maintaining Records
Resources Implication	Assessment is required to take place in real or appropriate simulated situations, including work areas, materials & equipment, & information on workplace practices and OHS practices.
Assessment Methods	Competency may be assessed through: <ul style="list-style-type: none"> • Interview / Written Test / Oral Questioning • Observation / Demonstration
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting

Occupational Standard: Home/Office Electrical/Electronic Equipment Servicing Level II	
Unit Title	Develop Business Practice
Unit Code	EEL HOS2 11 0511
Unit Descriptor	This unit specifies the outcomes required to establish a business operation from a planned concept. It includes researching the feasibility of establishing a business operation, planning the setting up of the business, implementing the plan and reviewing operations once commenced

Elements	Performance Criteria
1. Identify business opportunities	<p>1.1 Business opportunities are investigated and identified</p> <p>1.2 Feasibility study is undertaken to determine likely business viability</p> <p>1.3 Market research on product or service is undertaken</p> <p>1.4 Assistance with feasibility study of specialist and relevant parties is sought as required</p> <p>1.5 Impact of emerging or changing technology including e-commerce, on business operations are evaluated</p> <p>1.6 Practicability of business opportunity assessed in line with perceived risks, returns sought and resources available</p> <p>1.7 Business plan for operation is completed</p>
2. Identify personal business skills	<p>2.1 Financial and business skills available are identified and taken into account when business opportunities are researched</p> <p>2.2 Personal skills/attributes are assessed and matched against those perceived as necessary for a particular business opportunity</p> <p>2.3 Business risks are identified and assessed according to resources available and personal preferences</p>
3. Plan for establishment of business operation	<p>3.1 Business structure and operations are determined and documented</p> <p>3.2 Procedures to guide operations are developed and documented</p> <p>3.3 Financial backing for business operation is secured</p>

	<p>3.4 Business legal and regulatory requirements are identified and complied</p> <p>3.5 Human and physical resources required to commence business operation are determined</p> <p>3.6 Recruitment strategies are developed and implemented</p>
4. Implement establishment plan	<p>4.1 Marketing of business operation is undertaken</p> <p>4.2 Physical and human resources to implement business operation are obtained</p> <p>4.3 Operational unit to support and coordinate business operation is established</p> <p>4.4 Monitoring process for managing operation is developed and implemented</p> <p>4.5 Legal documents are carefully maintained and relevant records are kept and updated to ensure validity and accessibility</p> <p>4.6 Contractual procurement rights for goods and services including contracts with relevant people, negotiated and secured as required in accordance with the business plan</p> <p>4.7 Options for leasing/ownership of business premises identified and contractual arrangements completed in accordance with the business plan</p>
5. Review implementation process	<p>5.1 Review process for implementation of business operation is developed and implemented</p> <p>5.2 Improvements in business operation and associated management process are identified</p> <p>5.3 Identified improvements are implemented and monitored for effectiveness</p>

Variable	Range
Resources may include:	<ul style="list-style-type: none"> • staff • money • time • equipment • space
Business goals may include:	<ul style="list-style-type: none"> • sales targets • budgetary targets

	<ul style="list-style-type: none"> • team and individual goals • production targets • reporting deadlines
Problem solving techniques may include:	<ul style="list-style-type: none"> • gaining additional research and information to make better informed decisions • looking for patterns • considering related problems or those from the past and how they were handled • eliminating possibilities • identifying and attempting sub-tasks <ul style="list-style-type: none"> • collaborating and asking for advice or help from additional sources
Time management strategies may include:	<ul style="list-style-type: none"> • prioritizing and anticipating • short term and long term planning and scheduling • creating a positive and organized work environment • clear timelines and goal setting that is regularly reviewed and adjusted as necessary • breaking large tasks into smaller tasks • getting additional support if identified and necessary
Internal and external sources may include:	<ul style="list-style-type: none"> • staff and colleagues • management, supervisors, advisors or head office • relevant professionals such as lawyers, accountants, management consultants • professional associations

Evidence Guide	
Critical Aspects of Competence	<p>A person must be able to demonstrate:</p> <ul style="list-style-type: none"> • ability to identify daily work requirements and allocate work appropriately • ability to interpret financial documents in accordance with legal requirements
Underpinning Knowledge and Attitudes	<ul style="list-style-type: none"> • Federal and Local Government legislative requirements affecting business operations, especially in regard to occupational health and safety (OH&S), equal employment opportunity (EEO), industrial relations and anti-discrimination • technical or specialist skills relevant to the business operation • relevant industry code of practice • planning techniques to establish realistic timelines and priorities

	<ul style="list-style-type: none"> • identification of relevant performance measures • quality assurance principles and methods • relevant marketing, management, sales and financial concepts • methods for monitoring performance and implementing improvements • structured approaches to problem solving, idea management and time management
Underpinning Skills	<ul style="list-style-type: none"> • literacy skills to interpret legal requirements, company policies and procedures and immediate, day-to-day demands • communication skills including questioning, clarifying, reporting, and giving and receiving constructive feedback • numeracy skills for performance information, setting targets and interpreting financial documents and reports • technical and analytical skills to interpret business documents, reports and financial statements and projections • ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities • problem solving skills to develop contingency plans • using computers and software packages to record and manage data and to produce reports • evaluation skills for assessing work and outcomes • observation skills for identifying appropriate people, resources and to monitor work
Resource Implications	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> • Access to relevant workplace documentation, financial records, and equipment
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> • Interview / Written exam • Observation/Demonstration with Oral questioning
Context for Assessment	<p>Competence may be assessed in the workplace or in a simulated work environment</p>

[TOP](#)

Occupational Standard: Home/Office Electrical/Electronics Equipment Servicing Level II

Unit Title	Apply Continuous Improvement Processes (Kaizen)
Unit Code	EEL HOS2 12 1012
Unit Descriptor	This unit of competence covers the exercise of good workplace practice and effective participation in quality improvement teams. Personnel are required to ensure the quality and integrity of their own work, detect non-conformances and work with others to suggest improvements in productivity and quality.

Elements	Performance Criteria
1. Satisfy quality system requirements in daily work	1.1 Access information on quality system requirements for own job function 1.2 Record and report quality control data in accordance with quality system 1.3 Follow quality control procedures to ensure products, or data, are of a defined quality as an aid to acceptance or rejection 1.4 Recognize and report non-conformances or problems 1.5 Conduct work in accordance with sustainable energy work practices 1.6 Promote sustainable energy principles and work practices to other workers
2. Analyze opportunities for corrective and/or optimization action	2.1 Compare current work practices, procedures and process or equipment performance with requirements and/or historical data or records 2.2 Recognize variances that indicate abnormal or sub-optimal performance 2.3 Collect and/or evaluate batch and/or historical records to determine possible causes for sub-optimal performance 2.4 Use appropriate quality improvement techniques to rank the probabilities of possible causes
3. Recommend corrective and/or optimization actions	3.1 Analyze causes to predict likely impacts of changes and decide on the appropriate actions 3.2 Identify required changes to standards and procedures and training 3.3 Report recommendations to designated personnel
4. Participate in the implementation	4.1 Implement approved actions and monitor performance following changes to evaluate results

of recommended actions	<p>4.2 Implement changes to systems and procedures to eliminate possible causes</p> <p>4.3 Document outcomes of actions and communicate them to relevant personnel</p>
5. Participate in the development of continuous improvement strategies	<p>5.1 Review all relevant features of work practice to identify possible contributing factors leading to sub-optimal performance</p> <p>5.2 Identify options for removing or controlling the risk of sub-optimal performance</p> <p>5.3 Assess the adequacy of current controls, quality methods and systems</p> <p>5.4 Identify opportunities to continuously improve performance</p> <p>5.5 Develop recommendations for continual improvements of work practices, methods, procedures and equipment effectiveness</p> <p>5.6 Consult with appropriate personnel to refine recommendations before implementation of approved improvement strategies</p> <p>5.7 Document outcomes of strategies and communicate them to relevant personnel</p>

Variable	Range
Quality control procedures	<p>Quality control procedures may include:</p> <ul style="list-style-type: none"> • standards imposed by regulatory and licensing bodies • enterprise quality procedures • working to a customer brief or batch card and associated quality procedures • checklists to monitor job progress against agreed time, costs and quality standards • preparation of sampling plans • the use of hold points to evaluate conformance • the use of inspection and test plans to check compliance
Methods for statistical analysis	<p>Methods for statistical analysis may include:</p> <ul style="list-style-type: none"> • means • median • mode • ranges • standard deviations • statistical sampling procedures

Problem solving techniques	<p>Problem solving techniques may include:</p> <ul style="list-style-type: none"> • identifying inputs and outputs • sequencing a process • identifying and rectifying a problem step • root cause analysis • implementing preventative strategies
Quality improvement tools and techniques	<p>Quality improvement tools and techniques may include:</p> <ul style="list-style-type: none"> • run charts, control charts, histograms and scattergrams to present routine quality control data • plan, do, check, act (PDCA) • Ishikawa fishbone diagrams and cause and effect diagrams • logic tree • similarity/difference analysis • Pareto charts and analysis • force field/strength weakness opportunities threats (SWOT) analysis
Sustainable energy principles and work practices	<p>Sustainable energy principles and work practices may include:</p> <ul style="list-style-type: none"> • examining work practices that use excessive electricity • switching off equipment when not in use • regularly cleaning filters • insulating rooms and buildings to reduce energy use • recycling and reusing materials wherever practicable • minimizing process waste
Relevant personnel	<p>Communication to relevant personnel may involve:</p> <ul style="list-style-type: none"> • supervisors, managers and quality managers • administrative, laboratory and production personnel • internal/external contractors, customers and suppliers
Reporting	<p>Reporting may include:</p> <ul style="list-style-type: none"> • verbal responses • data entry into laboratory or enterprise database • brief written reports using enterprise proformas
Quality improvement opportunities	<p>Quality improvement opportunities could include improved:</p> <ul style="list-style-type: none"> • production processes • hygiene and sanitation procedures • reductions in waste and re-work • laboratory layout and work flow • safety procedures • communication with customers • methods for sampling, testing and recording data
Occupational health and safety (OHS) and environmental management requirements	<p>OHS and environmental management requirements:</p> <ul style="list-style-type: none"> • all operations must comply with enterprise OHS and environmental management requirements, which may be imposed through regional or federal legislation - these requirements must not be compromised at any time • all operations assume the potentially hazardous nature of samples and require standard precautions to be applied

	<ul style="list-style-type: none"> • where relevant, users should access and apply current industry understanding of infection control issued by the Ministry of Health
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Evidence Guide	
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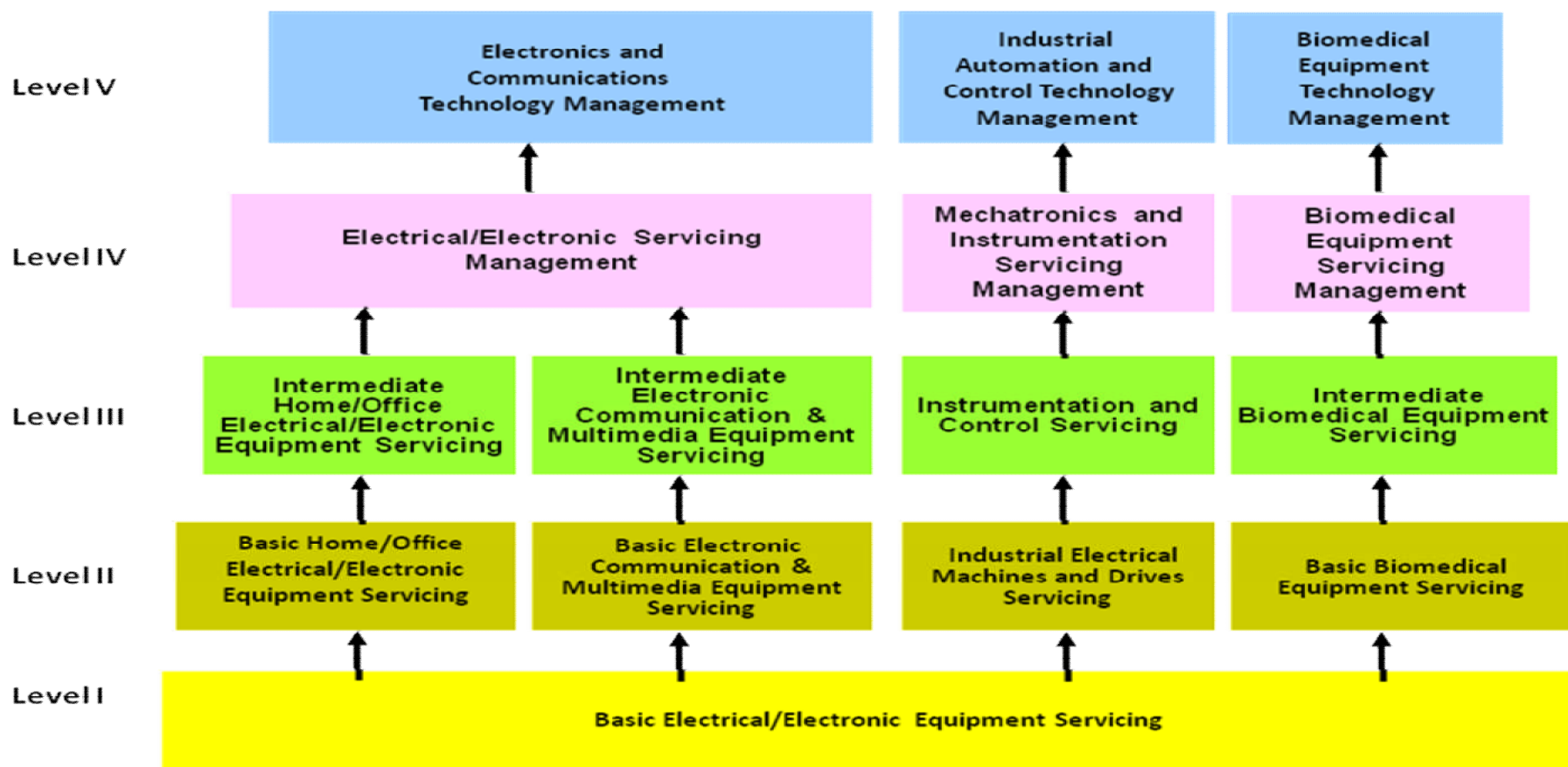
Critical Aspects of Competence	<p>Assessors should ensure that candidates can:</p> <ul style="list-style-type: none"> • use the enterprise's quality systems and business goals as a basis for decision making and action • apply all relevant procedures and regulatory requirements to ensure the quality and integrity of the products/services or data provided • apply and promote sustainable energy principles and work practices • detect non-conforming products or services in the work area • follow enterprise procedures for documenting and reporting information about quality • contribute effectively within a team to recognize and recommend improvements in productivity and quality • apply effective problem solving strategies • implement and monitor improved practices and procedures
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Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> • specifications for laboratory products and services in the candidate's work area • quality requirements associated with the individual's job function and/or work area • scientific and technical knowledge underpinning the processes, procedures, equipment and instrumentation associated with the candidate's work tasks and duties • workplace procedures associated with the candidate's regular technical duties • sustainable energy principles • relevant health, safety and environment requirements • layout of the enterprise, divisions and laboratory • organizational structure of the enterprise • lines of communication • role of laboratory services to the enterprise and customers • methods of making/recommending improvements • Standards, procedures and/or enterprise requirements
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Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> • applying problem solving techniques and strategies • applying statistical analysis and statistical sampling procedures • detecting non-conforming products or services in the work area • documenting and reporting information about quality
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	<ul style="list-style-type: none"> • contributing effectively within a team to recognize and recommend improvements in productivity and quality • implementing and monitoring improved practices and procedures • organizing, prioritizing activities and items • reading and interpreting documents describing procedures • recording activities and results against templates and other prescribed formats • working with others
Resources Implication	<p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the candidate • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies • enterprise quality manual and procedures • quality control data/records • customer complaints and rectifications
Methods of Assessment	<p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • verified reports of improvements suggested and implemented by the candidate individually <p>Those aspects of competence dealing with improvement processes could be assessed by the use of suitable simulations and/or a pilot plant and/or a range of case studies and scenarios.</p> <p>In all cases, practical assessment should be supported by questions to assess essential knowledge and those aspects of competence which are difficult to assess directly.</p>
Context of Assessment	Competence may be assessed in the work place or in a simulated workplace setting / environment.

Sector: Electrotechnology and Telecommunication
Sub-Sector: Electrotechnology



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This occupational standard was developed on May 2011 at Addis Ababa, Ethiopia.

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