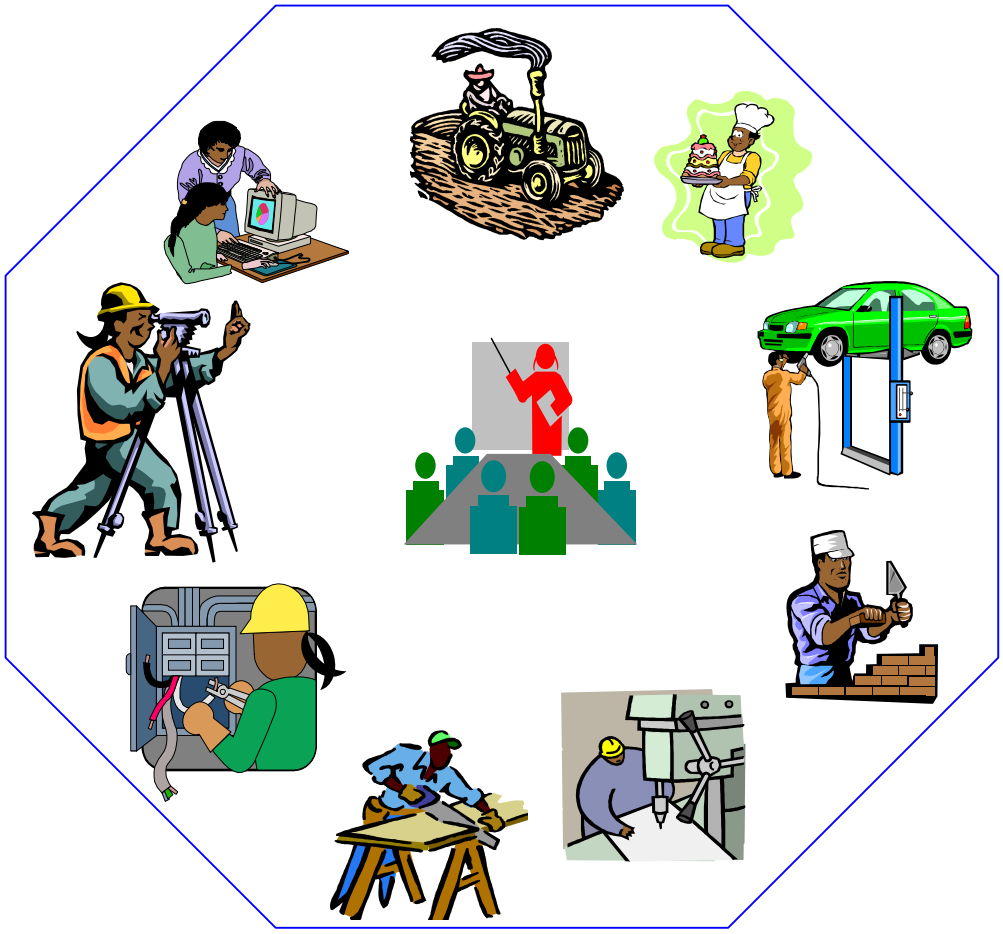
Federal Democratic Republic of Ethiopia

OCCUPATIONAL STANDARD

TRAIN ELECTRICAL/ ELECTRONICS ASSEMBLY SUPERVISION

NTQF Level IV



Ministry of Education
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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 Ethiopian Occupational Standard (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 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 title
- Unit code
- 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 level including the Unit Codes and the Unit Titles
- contents of each Unit of Competence listed in the chart
- 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

UNIT OF COMPETENCE CHART

Occupational Standard: Train Electrical/Electronic Assembly Supervision

Occupational Code: IND TES4

NTQF Level IV

IND TES4 01 0117 Provide Quotations for Installation or Train Electrical System Jobs	IND TES4 02 0117 Apply Safety and Legal Requirements for Electrical Train Systems	IND TES4 03 0117 Modify Electronic Sub Assemblies
IND TES4 04 0117 Conduct Tests on Assembled Train Electrical Devices and Electronic Apparatus	IND TES4 05 0117 Assemble and Connect Refrigerant System and Fittings	IND TES4 06 0117 Develop Strategies to Train Electrical System Sustainability
IND TES4 07 0117 Solve Problems to Density/Level Measurement Problems	IND TES4 08 0117 Plan and Organize Work	IND TES4 09 0117 Migrate to New Technology
IND TES4 10 0117 Establish Quality Standards	IND TES4 11 0117 Develop Individuals and Team	IND TES4 12 0117 Utilize Specialized Communication Skills
IND TES4 13 0117 Manage Micro, Small and Medium Enterprises (MSMEs)	IND TES4 14 0117 Apply Problem Solving Techniques and Tools	

Occupational Standard: Train Electrical/Electronic Assembly Supervision Level IV	
Unit Title	**Provide Quotations for Installation or Train Electrical System Jobs**
Unit Code	**IND TES4 01 0117**
Unit Descriptor	This unit covers providing quotations for installation and work not exceeding. It encompasses following job specification, using assemble catalogues, making installed electrical system ,fitting telephone, internet or email enquiries, selecting compliance materials, pricing materials and completing the necessary quotation documentation and applying the necessary work relations procedures.

Elements	Performance criteria
1. Establish the extent of the work.	1.1 OHS procedures for a given work area are identified, obtained and understood 1.2 Established OHS risk control measures and procedures are followed 1.3 The extent of installation or assembling work is determined from job specifications and discussions with employees and/or other appropriate person(s) 1.4 The extent of installation or assemble work on which a quotation is to be given is documented as a job specification and agreement sought with employees or other appropriate person(s) 1.5 OHS and other regulatory requirements are incorporated in the work on which the quotation is based 1.6 Requests for work to the job specification are negotiated with workers or other appropriate person(s) and within the constraints imposed by regulatory requirements 1.7 A date by which the quotation is to be submitted is agreed with the work supervisor and/or other appropriate person(s)
2. Develop quotations.	2.1 Material take-offs are performed accurately and checked against job specification(s) 2.2 Materials, labour and other costs are determined from industry standard labour rates, enterprise costing arrangements and/or material suppliers 2.3 ***Electrical train technology apparatus*** should be available in the work environment 2.4 Quotations are checked for accuracy in costing and against job specification

3. Document and submit quotation.	3.1 Quotation is documented in accordance with established policies and procedures 3.2 Quotation is submitted to customer within by an agreed date

Variables	**Range**
Electrical train technology apparatus	May include but not limited to: Automation technologies Computers Data Communications Electrical Electrical Machines Electronics Fire Protection Instrumentation Refrigeration and Air Conditioning Renewable/sustainable energy, and Security technology

Evidence Guide	
Critical Aspects of Assessment	Demonstrates skills and knowledge competencies to: Provide quotations for installation and assemble jobs on at least two occasions as described in 8) including: Establishing the extent of work on which the quotation is to be based. Taking of material accurately. Costing the job appropriately. Checking the quotation. Documenting the quotation clearly. Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.
Under pinning Knowledge& Attitude	Demonstrates knowledge of: Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures Enterprise communication methods encompassing: Communicating with personnel encompassing: Oral communications Written procedures and work instructions Communicating with suppliers Communicating with customers
Under pinning Skills	Demonstrates Skills of: • . Work activities records encompassing: ➢ Purpose and extent of maintaining work activities records in an enterprise ➢ Types of records for maintaining work activities in an

	enterprise ➢ Methods for recording and maintaining work records ➢ Work records required by regulation requirements Enterprise customer relations protocols encompassing: ➢ Purpose of customer relations ➢ Procedures for dealing with customers ➢ Dealing with customer issues Costing methods in an enterprise encompassing: ➢ Costing policy ➢ Purchase prices and discounts for materials ➢ Labour charge out rates ➢ Margins Costing small jobs encompassing: ➢ Resources to be quantified and costed ➢ Costing labour plant and materials
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.
Methods of Assessment	Competence may be assessed through: Interview / Written Test Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Train Electrical/Electronic Assembly Supervision Level IV	
Unit Title	**Apply Safety and Legal Requirements for Electrical Train Systems**
Unit Code	**IND TES4 02 0117**
Unit Descriptor	This unit covers the safety and legal requirements to handle, use and store in electrical work place. All safety aspects are covered to Ethiopian and International standards. Legal requirements are covered at local, State National level.

Elements	Performance criteria
1. Prepare to work with train systems	1.1 OHS procedures for a given work area are identified, obtained and understood through established routines and procedures 1.2 Work area access permits are obtained from appropriate personnel according to established procedures. 1.3 Preparations for electrical and non-electrical isolation are carried out to prevent creation of hazards from loss of machine/system/process control according to established procedures in ***work environment*** 1.4 Tools and equipment needed for the work are checked for safety and correct functionality according to established procedures and regulatory requirements.
2. Apply safe working practices to electrical train systems	2.1 Workplace procedures and work instructions for controlling risk are followed accurately. 2.2 Workplace procedures for dealing with accidents, fires and emergencies are followed according to ***job specifications***, work procedures and scope of responsibility and competencies.
3. Follow workplace procedures for hazard identification and risk control of electrical train system	3.1 Hazards are identified and control measures implemented and monitored through active participation in the consultation process with employer and other employees. 3.2 Hazards in the work area are recognised and reported to appropriate personnel according to established procedures. 3.3 OHS records of incidents are completed in accordance with regulatory requirements and established procedures. 3.4 Workplace instructions and training are followed accurately within established ***industrial work procedures***.

Variables	Range
Working environment	May include but not limited to: • This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.
Job specifications	May include but not limited to: • Relevant Occupational Health and Safety legislation, regulations and codes of practice related to hazards presented by the use of train electrical system and air conditioning systems.
Industrial work procedures	May include but not limited to: • Accepted industry work procedures and the specific safety procedures and work instructions related to working with train and air conditioning systems containing an electrical train systems

Evidence Guide	
Critical Aspects of Assessment	Demonstrates skills and knowledge competencies to: • Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures • Demonstrated consistent performance across a representative range of contexts from the prescribed items below: ➢ Preparing to enter the workplace including, the use of work permits and clearances and isolation permissions. ➢ Applying work procedures and instructions as they apply to risk control measures. ➢ Dealing with accidents and emergencies within the scope of responsibility. ➢ Participation in consultation processes, identifying hazards and implementing and monitoring control measures. ➢ Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items
Under pinning Knowledge& Attitude	Demonstrates knowledge of: • Environmental issues • Ultraviolet light and the Ozone Layer • The Greenhouse Effect and Global Warming • Electrical train system categories and basic compositions • Environmental issues for each category • Types of Train light are transit (LRT),electrical multiple unit (EMU),shunt locomotive and wagons

	• Types of an electrical train systems • Main circuit (traction circuit) , • Auxiliary Circuit And • Control Circuit • Material Specification preparation, selection and cooler identification
Under pinning Skills	Demonstrates Skills to: • Acts, Regulations and Standards • OHS Overview • Purpose of Acts, Regulations, Codes of Practice, Standards & guidelines • Duty of care • Applicable acts, standards and codes • Record keeping requirements • Toxicity and flammability groupings • Emergency Procedures & Incident Management • Work cover • Hazard Control and Risk Assessment • Typical emergency response plans • First Aid
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.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Train Electrical/Electronic Assembly Supervision Level IV	
Unit Title	**Modify Electronic Sub Assemblies**
Unit Code	**IND TES4 03 0117**
Unit Descriptor	This unit covers correcting and or modifying electronic sub assemblies. It encompasses working safely, high reliability de-soldering/soldering, checking components against job specifications, testing and following quality procedures.

Elements	Performance criteria
1. Prepare to modify	1.1 OHS procedures for a given work area are identified, obtained and understood 1.2 OHS risk control measures for work preparation are followed 1.3 The nature of the rework is determined from documentation or from work supervisor to establish the scope of work to be undertaken 1.4 Rework of subassemblies is coordinated with others involved in the work to ensure work schedules are met and safety measures are followed 1.5 Sources of materials that may be required for the work are established in accordance with established procedures 1.6 Tools and equipment required for rework are selected for their effectiveness and checked for correct operation and safety
2. Modify sub assemblies.	2.1 OHS risk control work measures and procedures are followed 2.2 The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures 2.3 Circuits are checked as being isolated where necessary in strict accordance OHS requirements and procedures 2.4 Components are de-connected and re-connected in accordance with principles and technology of connection methods used 2.5 Work is carried out in compliance with quality procedures and enterprise/industry standards 2.6 Rework ***modification of subassemblies*** is completed in acceptable timeframe and given environment and workplace condition

3. Check quality of modified sub assemblies.	3.1 OHS risk control measures for work completion are followed 3.2 Quality of rework is checked against enterprise/ industry standards 3.3 Functional tests on reworked subassemblies are carried out in accordance with established routines 3.4 Actions are taken to rectify defects within the scope of established ***job application*** routines 3.5 Report forms/data sheets on rework of subassemblies are completed accurately

Variables	**Range**
Modification of sub assemblies	May include but not limited to: • This unit must be demonstrated by modifying/reworking any electronic sub assembly in an environment designed specifically for the purpose
Job applications	May include but not limited to: • This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Evidence Guide	
Critical Aspects of Assessment	Demonstrates skills and knowledge competencies to: • Prepare to modify • Modify sub assemblies. • Check quality of modified sub assemblies.
Under pinning Knowledge& Attitude	Demonstrates knowledge of: • Enterprise quality management system encompassing: ➢ purpose of a quality system ➢ procedures pertaining to the relevant work function ➢ work instructions pertaining to the relevant work function • Printed wiring board substrate repair encompassing: ➢ war page and cracking damage ➢ blistering and delaminating • Conductor patterns repair, including encompassing: ➢ pad repair and replacement ➢ Track repair, alteration, replacement. • Conformal coatings encompassing: ➢ types ➢ removal and replacement • Quality checks encompassing: ➢ enterprise/ industry standards ➢ functional tests ➢ report forms/data sheets

Under pinning Skills	Demonstrates Skills of • Following job specifications • Using high reliability de-soldering/soldering techniques • Removing and placing components without damage • Adhering to quality procedures • Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items
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.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Train Electrical/Electronic Assembly Supervision Level IV	
Unit Title	**Conduct Tests on Assembled Train Electrical Devices and Electronic Apparatus**
Unit Code	**IND TES4 04 0117**
Unit Descriptor	This unit covers setting up testing equipment, inspecting the quality and testing functionality of electric or electronic apparatus. It encompasses working safely with electricity, testing device set-up, following testing and inspection procedures, interpreting and reporting testing and inspection results and making recommendations for dealing with defects.

Elements	Performance criteria
1. Prepare to conduct testing and inspection.	1.1 OHS procedures for a given work area are identified, obtained and understood 1.2 OHS risk control measures for work preparation are followed 1.3 Documented apparatus functions and quality requirements are identified, obtained and understood 1.4 Testing processes and procedures are reviewed and testing equipment is checked for correct operation and safety 1.5 Apparatus testing and inspection is coordinated with others involved in the work to ensure work schedules are met and safety measures are followed
2. Conduct apparatus tests.	2.1 OHS risk control work measures and procedures are followed 2.2 The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures 2.3 Apparatus is checked as being isolated where necessary in strict accordance OHS requirements, procedures and ***job applications*** 2.4 Testing is conducted in accordance with principles and technology of electrical measurement 2.5 Test results are interpreted within the scope of required functionality and quality
3. Conduct apparatus inspection.	3.1 OHS risk control work measures and procedures are followed 3.2 ***Assembled electronics*** Apparatus is checked as being isolated where necessary in strict accordance OHS requirements and procedures

	3.3 Apparatus is inspected for compliance with quality/industry standards 3.4 Work is completed in acceptable timeframe and given environment and workplace conditions
4. Report on apparatus testing and inspection.	4.1 Recommendations on repairs to defects are reported within the scope of established procedures 4.2 Report forms/data sheets on testing and inspection are completed accurately

Variables	**Range**
Job application	May include but not limited to: • The unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance
Assembled electronics	May include but not limited to: • This unit must be demonstrated in relation to conducting quality and functional tests on assembled electronic apparatus in an environment designed specifically for the purpose

Evidence Guide	
Critical Aspects of Assessment	Demonstrates skills and knowledge competencies to: • Selecting and using testing and measuring device correctly. • Interpreting test results. • Identifying visual defects. • Reporting test results. • Recommending appropriate actions for dealing with defect apparatus. • Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.
Under pinning Knowledge& Attitude	Demonstrates knowledge of: • Test equipment encompassing: ➢ types ➢ operation ➢ setting up ➢ Note. Testing equipment may be specific to a workplace and the electronic assembly under test • .Testing encompassing: ➢ requirements ➢ routine testing procedures ➢ check lists ➢ interpreting test results within given parameters

Under pinning Skills	Demonstrates Skills to: • Quality inspection encompassing: ➢ requirements ➢ routine testing procedures ➢ check lists ➢ interpreting test results within given parameters • Non-compliance reporting encompassing: ➢ methods and procedures ➢ documentation
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.
Methods of Assessment	Competence may be accessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Train Electrical/Electronic Assembly Supervision Level IV	
Unit Title	**Assemble and Connect Refrigerant System and Fittings**
Unit Code	**IND TES4 05 0117**
Unit Descriptor	This unit covers the basic connection of refrigeration and air conditioning system and fittings. It encompasses the safe use of hand, fixed and portable power tools for cutting, flaring, bending, swaging, silver brazing copper tube to copper tube, Bundy tube and brass and steel fittings, measurement and reading drawings and diagrams.

Elements	Performance criteria
1. Apply conditioning systems	1.1 OHS procedures for a given work area are identified, obtained and understood through established routines and procedures 1.2 Established OHS risk control measures and procedures are followed in preparation for the work. 1.3 Safety hazards which have not previously been identified are reported and advice on risk control measures is sought from the work supervisor. 1.4 The nature of work is obtained from documentation or from work supervisor to establish the scope of work to be undertaken. 1.5 Advice is sought from the work supervisor to ensure the work is coordinated effectively with others. 1.6 Sources of materials that may be required for the work are accessed in accordance with its ***job applications***, established routines and procedures. 1.7 Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety
2. Fabricate tubing and attach fittings for refrigeration and/or air conditioning systems	2.1 Established OHS risk control measures and procedures for carrying out the work are followed. 2.2 Work in strict accordance with OHS requirements and when necessary conducted within established safety procedures 2.3 Established methods used to cut, flare, swage, bend, silver braze tubing and fittings as they apply to the ***refrigeration/air conditioning equipment*** arrangements. 2.4 Refrigerant tubing and fittings are silver brazed with the use of dry nitrogen to prevent contamination. 2.5 Fabricate tubing and attach fittings are prepared

	efficiently without waste of materials or damage/contamination to apparatus and the surrounding environment or services and using sustainable energy practices. 2.6 Routine quality checks are carried out in accordance with work instructions/or specifications including dimensions and pressure testing.
3. Complete work and report	3.1 OHS work completion risk control measures and procedures are followed. 3.2 Work site is cleaned and made safe in accordance with established procedures. 3.3 Work supervisor is notified of the completion of the work in accordance with established procedures.

Variables	**Range**
Job applications	May include but not limited to: • This unit must be demonstrated in relation to preparing refrigerant tubing and fittings for at least two basic different refrigeration/air conditioning equipment layouts, which require cutting, flaring, bending, swaging, silver brazing copper tube to copper tube, Bundy tube, brass and steel fittings.
Refrigeration/air conditioning equipment	May include but not limited to: • piping/tubing and fittings for high pressure refrigerants

Evidence Guide	
Critical Aspects of Assessment	Demonstrates skills and knowledge competencies to: • Applying tubing and fitting appropriately to equipment layout • Using established methods to cut, flare, bend, swage and silver brazing copper tube • Attaching fittings correctly • Conducting component routine quality checks • Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items Note: • Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.
Under pinning Knowledge& Attitude	Demonstrates knowledge of: • Piping: ➢ Refrigeration & water grade copper tube

	➢ Maintaining cleanliness (always capped, do not blow out with mouth etc) ➢ Soft and hard drawn tube ➢ Tubing applications (soft, hard, pair coil, water grade etc) ➢ Tube qualities - diameter, wall thickness (gauge) and pressure ratings (R410A etc) ➢ Pipe insulation (types - tube, slit tube, sheet etc and joining methods - glue, tape etc) ➢ Other tube materials (Bundy, steel, aluminium, brass) • Cutting: ➢ Cutting tools (Imps, normal & large pipe cutters, tube cutting rings etc) ➢ Precautions while cutting (sharp burrs, sharp blades etc) ➢ Debarring tools (reamers, deburrers etc) • Bending: ➢ Bending tools (springs, levers, presses etc) ➢ Precautions while bending (work hardening, collapsing etc) ➢ Bending hard drawn tube - the process of annealing • Joining: ➢ Flare nuts (plain, short barrel, frost proof, reducing) ➢ Flaring tools (flare block, eccentric with clutch for high pressure tube) ➢ Precautions while flaring (debarred, length past block face, cleanliness) ➢ Swaging tools (punch, flare block, expander etc) ➢ Precautions while swaging (length past block face, tube shortening effect, cleanliness etc) ➢ Other tube fittings (BSP to flare elbows, tees, unions, plugs, flare washers, Lokrings etc) ➢ Thread sealants (tapes, pastes etc) ➢ Access valves (Schrader, piercing, cut-away of service valve/s) ➢ Precautions using access valves (refrigerant leakage, core removal, limitations on piercing valves etc) • Soldering and brazing equipment: ➢ Gas types (oxy acetylene, air acetylene, propane, Map gas)
Under pinning Skills	Demonstrates Skills to: • Hazards associated with their use (cylinder transport, remove regulator, oil & oxy = bang) • Personal safety (MSDS - oxy, acetylene, propane, MAPP gas) • Flash back arrestors • Setting up equipment (fitting regulator, adjusting

	pressures, tip selection) • Igniting and flame types (flint guns, oxidising, neutral, carburising) • Care and maintenance of equipment (hoses, regulator, tips, cylinders, flash back arrestors) • Silver solder: ➢ Types (yellow, brown, blue and their metal components) ➢ Personal safety (MSDS - silver brazing alloys) ➢ Flux and its use (dissimilar metals) ➢ Personal safety (MSDS - flux) ➢ Preparing surfaces (removing oxides, oils, applying flux) • Soldering techniques: ➢ Dry nitrogen ➢ Personal safety (MSDS - nitrogen) ➢ Applying dry nitrogen to a piping circuit ➢ Silver soldering copper to copper ➢ Silver soldering copper to dissimilar metals ➢ Annealing copper tube
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.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Train Electrical/Electronic Assembly Supervision Level IV	
Unit Title	**Develop Strategies to Train Electrical System Sustainability**
Unit Code	**IND TES4 06 0117**
Unit Descriptor	This unit covers developing strategies to address greenhouse gases and sustainability issues for, electrical train commercial and industrial electrical installations. It encompasses working safely, apply extensive knowledge of electrical installations and components and their operating parameters, gathering and analysing data, applying problem solving techniques, developing and documenting alternatives solutions..

Elements	Performance criteria
1. Prepare to develop strategies to address sustainability issues.	1.1 OHS processes and procedures for a given work area are identified, obtained and understood 1.2 Established OHS risk control measures and procedures are followed in preparation for the work 1.3 The extent of the sustainability issues are determined from performance specifications and situation reports and in consultation with relevant persons 1.4 Activities are planned to meet scheduled timelines in consultation with others involved in the work 1.5 Effective strategies are determined to ensure solution development and implementation is carried out efficiently
2. Develop strategies to address sustainability issues	2.1 OHS risk control measures and procedures for carrying out the work are followed 2.2 Knowledge of sustainability is applied to developing strategies to address greenhouse gas and sustainability issues 2.3 Parameters, specifications and performance requirements in relation to sustainability issues are set in accordance with established procedures 2.4 Approaches to resolving sustainability issues are analysed to provide most effective solutions 2.5 Unplanned events are dealt with safely and effectively consistent with regulatory requirements and enterprise policy 2.6 Quality of work is monitored against personal performance agreement and/or established organisational or professional standards

3. Document strategies to address sustainability issues	3.1 Solutions to sustainability issues are tested to determine their effectiveness and modified where necessary 3.2 Adopted solutions are documented, including instructions for implementation that incorporates risk control measures to be followed 3.3 Appropriately competent and qualified persons required to implement solutions to sustainability issues are coordinated in accordance with regulatory requirements and enterprise policy (See Note) 3.4 Justification for strategies used to solve ***typical sustainable issues*** is documented for inclusion in work/project development records in accordance with professional standards

Variables	**Range**
Typical sustainability issues	May include but not limited to: • Those are encountered in meeting sustainability performance standards, such as reducing needs for energy use, reducing causes of greenhouse gas emissions, revising a energy system operating parameters and dealing with energy system efficiencies.

Evidence Guide	
Critical Aspects of Assessment	Demonstrates skills and knowledge competencies to: • Understanding the extent of the electrical installation energy problem/s • Forming effective strategies for solution development and implementation • Obtaining energy system/component parameters, specifications and performance requirements appropriate to each problem • Testing solutions to energy problems • Documenting instruction for implementation of solutions that incorporate risk control measure to be followed • Documenting justification of solutions implemented in accordance with professional standards • Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items Note: • Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence must be clearly identified.

Under pinning Knowledge& Attitude	Demonstrates knowledge of: • Energy management, legislation and regulation encompassing: ➢ Energy Management ➢ Climate Change ➢ Greenhouse Effect/Greenhouse Gases ➢ Standards and codes ➢ Legislation and regulations ➢ Energy Audits • Electrical motors, pumps and fans encompassing: ➢ Motor Construction, Components & Losses ➢ Motor efficiency (MEPS - AS/NZS 1359.5)
Under pinning Skills	Demonstrates Skills to: • Appliances encompassing: ➢ Energy Star ratings ➢ Washing machines ➢ Clothes dryers ➢ Dishwashers ➢ Televisions and computers ➢ Standby Management strategies • Energy efficient lighting encompassing: ➢ Lighting efficiency ➢ Efficient Lighting design ➢ Ballasts ➢ Lighting controls • Water Heating encompassing: ➢ Water heating systems and losses ➢ Electric, gas, oil, heat pump and solar water heater design ➢ Control strategies • Space Heating and cooling encompassing: ➢ Space heating systems and losses ➢ Space cooling systems and losses ➢ Heating - Electric, gas, oil, heat pump and solar heater design ➢ Cooling – Direct expansion, chilled water and ventilation ➢ Control strategies • Solar energy encompassing: ➢ System design fundamentals ➢ Solar PV design elements ➢ Solar PV system performance ➢ Analysis of system capital and operating cost performance
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.

Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Train Electrical/Electronic Assembly Supervision Level IV	
Unit Title	**Solve Problems to Density/Level Measurement Problems**
Unit Code	**IND TES4 07 0117**
Unit Descriptor	This unit covers setting up density/level measuring components and systems and providing solutions as they apply to various process and control work functions. It encompasses working safely, setting up and calibrating density/level measuring components and systems, problem solving techniques, the use of a range of measuring devices, providing solutions derived from measurements and calculations to predictable problems in density/level measurement components and systems.

Elements	Performance criteria
1. Prepare to work on density/level measurement components and systems	1.1 OHS procedures for a given work area are identified, obtained and understood 1.2 OHS risk control work preparation measures and procedures are followed. 1.3 The nature of the ***density/level measurement problems*** are obtained from documentation or from an appropriate person to establish the scope of work to be undertaken. 1.4 Appropriate personnel are consulted to ensure the work is coordinated effectively with others involved or affected by the work. 1.5 Sources of materials that may be required for the work are established in accordance with established procedures. 1.6 Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety
2. Solve density/level measurement problems	2.1 OHS risk control work measures and procedures are followed. 2.2 The need to test or measure any electrical components live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures 2.3 ***Density/level measurement apparatus and systems*** are checked as being isolated where necessary in strict accordance OHS requirements and procedures 2.4 Established methods are used to solve measurement problems from tests and calculated values as they apply to density/level measurement systems.

	2.5 Unexpected situations are dealt with safely and with the approval of an authorised person. 2.6 Problems are solved using sustainable energy principles and without damage to apparatus, the surrounding environment or services.
3. Complete work and document work activities	3.1 OHS work completion risk control measures and procedures are followed. 3.2 Work site is cleaned and made safe in accordance with established procedures. 3.3 Written justification is made for solutions to density/level measurement problems. 3.4 Work completion is documented and appropriate person(s) notified in accordance with established procedures.

Variables	**Range**
Density/level measurement problems	May include but not limited to: • Determining the operating parameters of a density/level measuring system • Setting up and calibrating density/level measuring system • Altering an existing density/level measuring system to comply with specified operating parameters • Developing a density/level measuring system to comply with a specified function and operating parameters
Density/level measurement apparatus and systems	May include but not limited to: • As they apply to chemical, industrial or medical processes associated with installation, fault finding, maintenance or development work functions

Evidence Guide	
Critical Aspects of Assessment	Demonstrates skills and knowledge competencies to: • Solve problems in density/level measurement systems • Determining the operating parameters of a density/level measuring system • Setting up and calibrating a density/level measuring system • Altering an existing density/level measuring system to comply with specified operating parameters • Developing a density/level measuring system to comply with a specified function and operating parameters • Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items
Under pinning	Demonstrates knowledge of:

Knowledge& Attitude	• Introduction to level/density measurement encompassing: ➢ Definitions density and relative density (sg) ➢ Application ➢ Factors affecting density ➢ Density measurement ➢ Archimedes' Principle ➢ Density calculations ➢ Types and applications of level/density transducers ➢ Transducers input/outputs - measurement and evaluation ➢ Transducer connections • Level measurement techniques – sight type encompassing: ➢ Dipstick and hook gauges ➢ Tubular and flat glass gauges ➢ Accuracy of flat glass gauges ➢ Magnetically coupled gauges ➢ Float Level Measuring devices ➢ Application of float devices
Under pinning Skills	Demonstrates Skills to: • Level/density measurement - force type techniques encompassing: ➢ Comparison of float and displacement type systems ➢ Interface sensing devices ➢ Torque tube type displacer operation ➢ Torque tube type displacer construction ➢ Pneumatic and electronic transmitters • Level/density measurement - pressure-type techniques encompassing: ➢ Diaphragm level detectors ➢ Applications of diaphragm level detectors ➢ Differential pressure cells advantages and disadvantages ➢ Density measurement using D/P cells • Level/density measurement - electrical techniques encompassing: ➢ Application of conductance probes ➢ Operation of a conductivity-level controller ➢ Resistance tapes level detectors ➢ Capacitance probes level detectors ➢ Ultrasonic level detectors ➢ Microwave-based level detectors ➢ Nucleonic-type level sensors ➢ Load Cells used for level measurement • Level/density measurement - non-intrusive type techniques encompassing: ➢ Radiation-type density sensor

	➢ Hydrometer element used for density measurement ➢ Vibrating tube type liquid density meter • Level/density measurement calibration encompassing: ➢ D/P cell calculations ➢ D/P cell calibration ➢ Open Tank installation level measurement
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.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Train Electrical/Electronic Assembly Supervision Level IV	
Unit Title	**Plan and Organize Work**
Unit Code	**IND TES4 08 0117**
Unit Descriptor	This unit covers the knowledge, skills and attitude required in planning and organizing work activities in a production application. It may be applied to a small independent operation or to a section of a large organization.

Elements	Performance Criteria
1. Set objectives	1.1 ***Objectives*** are planned consistent with and linked to work activities in accordance with organizational aims. 1.2 Objectives are stated as measurable targets with clear time frames. 1.3 Support and commitment of team members are reflected in the objectives. 1.4 Realistic and attainable objectives are identified.
2. Plan and schedule work activities	2.1 Tasks/work activities to be completed are identified and prioritized as directed. 2.2 Tasks/work activities are broken down into steps in accordance with set time frames and achievable components. 2.3 Task/work activities are assigned to appropriate team or individuals in accordance with agreed functions. 2.4 ***Resources*** are allocated as per requirements of the activity. 2.5 ***Schedule of work activities*** is coordinated with personnel concerned.
3. Implement work plans	3.1 ***Work methods and practices*** are identified in consultation with personnel concerned. 3.2 ***Work plans*** are implemented in accordance with set time frames, resources and ***standards.***
4. Monitor work activities	4.1 Work activities are monitored and compared with set objectives. 4.2 Work performance is monitored. 4.3 Deviations from work activities are reported and recommendations are coordinated with appropriate personnel and in accordance with set standards. 4.4 Reporting requirements are complied with in accordance with recommended format.

	4.5 Timeliness of report is observed. 4.6 Files are established and maintained in accordance with standard operating procedures.
5. Review and evaluate work plans and activities	5.1 Work plans, strategies and implementation are reviewed based on accurate, relevant and current information. 5.2 Review is done based on comprehensive consultation with appropriate personnel on outcomes of work plans and reliable feedback. 5.3 Results of review are provided to concerned parties and formed as the basis for adjustments/simplifications to be made to policies, processes and activities. 5.4 Performance appraisal is conducted in accordance with organization rules and regulations. 5.5 Performance appraisal report is prepared and documented regularly as per organization requirements. 5.6 Recommendations are prepared and presented to ***appropriate personnel/authorities***. 5.7 ***Feedback mechanisms*** are implemented in line with organization policies.

Variable	**Range**
Objectives	May include but not limited to: • Specific • General
Resources	May include but not limited to: • Personnel • Equipment and technology • Services • Supplies and materials • Sources for accessing specialist advice • Budget
Schedule of work activities	May include but not limited to: • Daily • Work-based • Contractual Regular
Work methods and practices	May include but not limited to: • Legislated regulations and codes of practice • Industry regulations and codes of practice • Occupational health and safety practices

Work plans	May include but not limited to: • Daily work plans • Project plans • Program plans • Resource plans • Skills development plans • Management strategies and objectives
Standards	May include but not limited to: • Performance targets • Performance management and evaluation systems • Occupational standards • Employment contracts • Client contracts • Discipline procedures • Workplace assessment guidelines • Internal quality assurance • Internal and external accountability and auditing requirements • Training Regulation Standards and Safety Standards
Appropriate personnel/ authorities	May include but not limited to: • Appropriate personnel include: • Management and Line Staff
Feedback mechanisms	May include but not limited to: • Verbal feedback • Informal feedback • Formal feedback • Questionnaire • Survey and Group discussion

Evidence Guide	
Critical Aspects of Competence	Demonstrates skills and knowledge to: • set objectives • plan and schedule work activities • implement work plans • monitor work activities • review and evaluate work plans and activities
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • organization's strategic plan, policies rules and regulations, laws and objectives for work unit activities and priorities • organizations policies, strategic plans, guidelines related to the role of the work unit • team work and consultation strategies
Underpinning Skills	Demonstrates skill to: • plan • lead • organize

	• coordinate • communicate • inter-and intra-person/motivation skills • present
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Train Electrical/Electronic Assembly Supervision Level IV	
Unit Title	**Migrate to New Technology**
Unit Code	**IND TES4 09 0117**
Unit Descriptor	This unit defines the competence required to apply skills and knowledge in using new or upgraded technology. The rationale behind this unit emphasizes the importance of constantly reviewing work processes, skills and techniques in order to ensure that the quality of the entire business process is maintained at the highest level possible through the appropriate application of new technology. To this end, the person is typically engaged in on-going review and research in order to discover and apply new technology or techniques to improve aspects of the organization's activities.

Elements	Performance Criteria
1. Apply existing knowledge and techniques to technology and transfer	1.1 Situations are identified where existing knowledge can be used as the basis for developing new skills. 1.2 New or upgraded technology skills are acquired and used to enhance learning. 1.3 New or upgraded equipment are identified, classified and used where appropriate, for the benefit of the organization.
2. Apply functions of technology to assist in solving organizational problems	2.1 Testing of new or upgraded equipment is conducted according to the specification manual. 2.2 Features of new or upgraded equipment are applied within the organization. 2.3 Features and functions of new or upgraded equipment are used for solving organizational problems. 2.4 Sources of information relating to new or upgraded equipment are accessed and used.
3. Evaluate new or upgraded technology performance	3.1 New or upgraded equipment is evaluated for performance, usability and against OHS standards. 3.2 ***Environmental considerations*** are determined from new or upgraded equipment. 3.3 ***Feedback*** is sought from users where appropriate.

Variables	Range
Environmental Considerations	May include but is not limited to: • recycling, safe disposal of packaging (e.g. cardboard, polystyrene, paper, plastic) and correct disposal of waste materials by an authorized body

Feedback	May include but is not limited to: • surveys, • questionnaires, • interviews and meetings

Evidence Guide	
Critical Aspects of Competence	Competence must confirm the ability to transfer the application of existing skills and knowledge to new technology
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • Broad awareness of current technology trends and directions in the industry (e.g. systems/procedures, services, new developments, new protocols) • Vendor product directions • Ability to locate appropriate sources of information regarding metal manufacturing and new technologies • Current industry products/services, procedures and techniques with knowledge of general features • Information gathering techniques
Underpinning Skills	Demonstrate skills of: • Research skills for identifying broad features of new technologies • Ability to assist in the decision making process • Literacy skills in regard to interpretation of technical manuals • Ability to solve known problems in a variety of situations and locations • Evaluate and apply new technology to assist in solving organizational problems • General analytical skills in relation to known problems
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.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Train Electrical/Electronic Assembly Supervision Level IV	
Unit Title	**Establish Quality Standards**
Unit Code	**IND TES4 10 0117**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to establish quality specifications for work outcomes and work performance. It includes monitoring and participation in maintaining and improving quality, identifying critical control points in the production of quality output and assisting in planning and implementing of quality assurance procedures.

Elements	Performance Criteria
1. Establish quality specifications for product	1.1 Market specifications are ***sourced*** and ***legislated requirements*** identified. 1.2 Quality specifications are developed and agreed upon. 1.3 Quality specifications are documented and introduced to organization staff / personnel in accordance with the organization policy. 1.4 Quality specifications are updated when necessary.
2. Identify hazards and critical control points	2.1. Critical control points impacting on quality are identified. 2.2. Degree of risk for each hazard is determined. 2.3. Necessary documentation is accomplished in accordance with organization quality procedures
3. Assist in planning of quality assurance procedures	3.1 Procedures for each identified control point are developed to ensure optimum quality. 3.2 Hazards and risks are minimized through application of appropriate controls. 3.3 Processes are developed to monitor the effectiveness of quality assurance procedures.
4. Implement quality assurance procedures	4.1 Responsibilities for carrying out procedures are allocated to staff and contractors. 4.2 Instructions are prepared in accordance with the enterprise's quality assurance program. 4.3 Staff and contractors are given induction training on the quality assurance policy. 4.4 Staff and contractors are given in-service training relevant to their allocated ***safety procedures***.
5. Monitor quality of work outcome	5.1 Quality requirements are identified.

	5.2 Inputs are inspected to confirm capability to meet quality requirements. 5.3 Work is conducted to produce required outcomes. 5.4 Work processes are monitored to confirm quality of output and/or service. 5.5 Processes are adjusted to maintain outputs within specification.
6. Participate in maintaining and improving quality at work	6.1 Work area, materials, processes and product are routinely monitored to ensure compliance with quality requirements. 6.2 Non-conformance in inputs, process, product and/or service is identified and reported according to workplace reporting requirements. 6.3 Corrective action is taken within level of responsibility, to maintain quality standards. 6.4 Quality issues are raised with designated personnel.
7. Report problems that affect quality	7.1 Potential or existing quality problems are recognized. 7.2 Instances of variation in quality are identified from specifications or work instructions. 7.3 Variation and potential problems are reported to supervisor/manager according to enterprise guidelines.

Variable	**Range**
Sourced	May include but is not limited to: • End-users • Customers or stakeholders
Legislated requirements	May include but is not limited to: • Verification of product quality as part of consumer legislation or specific legislation related to product content or composition.
Safety procedures.	May include but is not limited to: • Use of tools and equipment for fabrication/production/ manufacturing works • Workplace environment and handling of material safety, • Following occupational health and safety procedures designated for the task • Respect the policies, regulations, legislations, rule and procedures for manufacturing/production/fabrication works

Evidence Guide	
Critical Aspect of Competence	Demonstrates skills and knowledge to: • Monitor quality of work

	• Establish quality specifications for product • Participate in maintaining and improving quality at work • Identify hazards and critical control points in the production of quality product • Assist in planning of quality assurance procedures • Report problems that affect quality • Implement quality assurance procedures
Underpinning Knowledge	Demonstrates knowledge of: • work and product quality specifications • quality policies and procedures • improving quality at work • hazards and critical points of operation • obtaining and using information • applying federal and regional legislation within day-today work activities • accessing and using management systems to keep and maintain accurate records • requirements for correct preparation and operation • technical writing
Underpinning Skills	Demonstrates skills to: • monitor quality of work • establish quality specifications for product • participate in maintaining and improving quality at work • identify hazards and critical control points in the production of quality product • assist in planning of quality assurance procedures • report problems that affect quality • implement quality assurance procedures
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Train Electrical/Electronic Assembly Supervision Level IV	
Unit Title	**Develop Individuals and Team**
Unit Code	**IND TES4 11 0117**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to determine individual and team development needs and facilitate the development of the workgroup.

Elements	Performance Criteria
1. Provide team leadership	1.1 ***Learning and development needs*** are systematically identified and implemented in line with ***organizational requirements***. 1.2 Learning plan to meet individual and group training and developmental needs is collaboratively developed and implemented. 1.3 Individuals are encouraged to self-evaluate performance and identify areas for improvement. 1.4 ***Feedback on performance*** of team members is collected from relevant sources and compared with established team learning process.
2. Foster individual and organizational growth	2.1 Learning and development program goals and objectives are identified to match the specific knowledge and skills requirements of Competence standards. 2.2 ***Learning delivery methods*** are made appropriate to the learning goals, the learning style of participants and availability of equipment and resources. 2.3 Workplace learning opportunities and coaching/ mentoring assistance are provided to facilitate individual and team achievement of competencies. 2.4 Resources and timelines required for learning activities are identified and approved in accordance with organizational requirements.
3. Monitor and evaluate workplace learning	3.1 Feedback from individuals or teams is used to identify and implement improvements in future learning arrangements. 3.2 Outcomes and performance of individuals/teams are assessed and recorded to determine the effectiveness of development programs and the extent of additional support. 3.3 Modifications to learning plans are negotiated to improve the efficiency and effectiveness of learning. 3.4 Records and reports of competence are maintained within organizational requirement.

4. Develop team commitment and cooperation	4.1 Open communication processes to obtain and share information is used by team. 4.2 Decisions are reached by the team in accordance with its agreed roles and responsibilities. 4.3 Mutual concern and camaraderie are developed in the team.
5. Facilitate accomplishment of organizational goals	5.1 Team members are actively participated in team activities and communication processes. 5.2 Individual and joint responsibility is developed by team's members for their actions. 5.3 Collaborative efforts are sustained to attain organizational goals.

Variable	**Range**
Learning and development needs	May include but is not limited to: • Coaching, monitoring and/or supervision • Formal/informal learning program • Internal/external training provision • Work experience/exchange/opportunities • Personal study • Career planning/development • Performance evaluation • Workplace skills assessment • Recognition of prior learning
Organizational requirements	May include but is not limited to: • Quality assurance and/or procedures manuals • Goals, objectives, plans, systems and processes • Legal and organizational policy/guidelines and requirements • Safety policies, procedures and programs • Confidentiality and security requirements • Business and performance plans • Ethical standards • Quality and continuous improvement processes and standards
Feedback on performance	May include but is not limited to: • Formal/informal performance evaluation • Obtaining feedback from supervisors and colleagues • Obtaining feedback from clients • Personal and reflective behavior strategies • Routine and organizational methods for monitoring service delivery
Learning delivery methods	May include but is not limited to: • On the job coaching or monitoring • Problem solving

	• Presentation/demonstration • Formal course participation • Work experience and involvement in professional networks • Conference and seminar attendance

Evidence Guide	
Critical Aspects of Competence	Demonstrates skills and knowledge to: • identify and implement learning opportunities for others • give and receive feedback constructively • facilitate participation of individuals in the work of the team • negotiate plans to improve the effectiveness of learning • prepare learning plans to match skill needs • access and designate learning opportunities
Underpinning Knowledge and Attitude	Demonstrates knowledge of: • coaching and monitoring principles • how to work effectively with team members who have diverse work styles, aspirations, cultures and perspective • how to facilitate team development and improvement • methods and techniques to obtain and interpreting feedback • methods for identifying and prioritizing personal development opportunities and options • career paths and competence standards in the industry
Underpinning Skills	• read and understand a variety of texts, preparing general information and documents according to target audience; spell with accuracy; use grammar and punctuation effective relationships and conflict management • communicate including receiving feedback and reporting, maintaining effective relationships and conflict management • plan and organize required resources and equipment to meet learning needs • coach and mentor skills to provide support to colleagues • report to organize information; assess information for relevance and accuracy; identify and elaborate on learning outcomes • facilitate and conduct small group training sessions • relate to people from a range of social, cultural, physical and mental backgrounds
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.

Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Train Electrical/Electronic Assembly Supervision Level IV	
Unit Title	**Utilize Specialized Communication Skills**
Unit Code	**IND TES4 12 0117**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to use specialized communication skills to meet specific needs of internal and external clients, conduct interviews, facilitate group discussions, and contribute to the development of communication strategies.

Elements	Performance Criteria
1. Meet common and specific communication needs of clients and colleagues	1.1 Specific communication needs of clients and colleagues are identified and met. 1.2 Different approaches are used to meet communication needs of clients and colleagues. 1.3 Conflict is addressed promptly and in a timely way and in a manner which does not compromise the standing of the organization.
2. Contribute to the development of communication strategies	2.1 ***Strategies*** for internal and external dissemination of information are developed, promoted, implemented and reviewed as required. 2.2 Channels of communication are established and reviewed regularly. 2.3 Coaching in effective communication is provided 2.4 Work related network and relationship are maintained as necessary. 2.5 Negotiation and conflict resolution strategies are used where required. 2.6 Communication with clients and colleagues is made appropriate to individual needs and organizational objectives.
3. Represent the organization	3.1 When participating in internal or external fora, presentation is relevant, appropriately researched and presented in a manner to promote the organization. 3.2 Presentation is made clear and sequential and delivered within a predetermined time. 3.3 Appropriate media is utilized to enhance presentation. 3.4 Differences in views are respected. 3.5 Written communication is made consistent with organizational standards. 3.6 Inquiries are responded in a manner consistent with

	organizational standard.
4. Facilitate group discussion	4.1 Mechanisms which enhance ***effective group interaction*** are defined and implemented. 4.2 Strategies which encourage all group members to participate are used routinely. 4.3 Objectives and agenda are routinely set and followed for meetings and discussions. 4.4 Relevant information are provided to group to facilitate outcomes. 4.5 Evaluation of group communication strategies is undertaken to promote participation of all parties. 4.6 Specific communication needs of individuals are identified and addressed.
5. Conduct interview	5.1 A range of appropriate communication strategies are employed in ***interview situations***. 5.2 Different ***types of interview*** is conducted in accordance with the organizational procedures. 5.3 Records of interviews are made and maintained in accordance with organizational procedures. 5.4 Effective questioning, listening and nonverbal communication techniques are used to ensure that required message is communicated.

Variable	**Range**
Strategies	May include but is not limited to: • Recognizing own limitations • Utilizing techniques and aids • Providing written drafts • Verbal and non verbal communication
Effective group interaction	May include but is not limited to: • Identifying and evaluating what is occurring within an interaction in a non-judgmental way • Using active listening • Making decision about appropriate words, behavior • Putting together response which is culturally appropriate • Expressing an individual perspective • Expressing own philosophy, ideology and background and exploring impact with relevance to communication
Interview situations	May include but is not limited to: • Establish rapport • obtain facts and information • Facilitate resolution of issues • Develop action plans

	• Diffuse potentially difficult situation
Types of Interview	May include but is not limited to: • Related to staff issues • Routine • Confidential • Evidential • Non-disclosure • Disclosure

Evidence Guide	
Critical Aspects of Competence	Demonstrates skills and knowledge to: • Demonstrate effective communication skills with clients and work colleagues accessing service • Adopt relevant communication techniques and strategies to meet client particular needs and difficulties
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • communication process • dynamics of groups and different styles of group leadership • communication skills relevant to client groups
Underpinning Skills	Demonstrates skills to: • full range of communication techniques including: ➢ active listening ➢ feedback ➢ interpretation ➢ role boundaries setting ➢ negotiation ➢ establishing empathy ➢ communication strategies • communicate to fulfill job roles as specified by the organization
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Train Electrical/Electronic Assembly Supervision Level IV	
Unit Title	**Manage Micro, Small and Medium Enterprises (MSMEs)**
Unit Code	**IND TES4 13 0117**
Unit Descriptor	This unit covers knowledge, skills and attitude required in running Micro, Small and Medium enterprises. The strategies involve developing, monitoring and managing work activities and financial information, developing effective work habits, and adjusting work schedules as needed.

Elements	Performance Criteria
1. Develop and communicate Strategic work plan	1.1 The importance of planning is sensitized before acting and about the importance of plans to reduce risks and to inhibit impulsive actions and discussed. 1.2 The basics of planning and beginning with goal setting are communicated. 1.3 The achievement of measurable and realistic short-term business objective is addressed. 1.4 How to develop realistic activities plans and schedule is discussed. 1.5 ***Major components of work plan*** are introduced and understood. 1.6 The importance of constant reviewing their plans is understood by monitoring the results.
2. Identify daily work requirements and Develop effective work habits	2.1 Basic concept about effect working culture is discussed and understood. 2.2 Different approaches to work culture are developed and understood. 2.3 Work requirements are identified for a given time period by taking into consideration of ***resources*** and constraints. 2.4 Work activities are prioritized based on business needs, requirements and deadlines. 2.5 If appropriate, work is allocated to relevant staff or contractors to optimize efficiency. 2.6 Work and personal priorities are identified and a balance is achieved between competing priorities using appropriate ***time management strategies***. 2.7 Input is sought from ***internal and external sources*** and used to develop and refine new ideas and approaches.

	2.8 Business or inquiries is/are responded to promptly and effectively. 2.9 Information is presented in a format appropriate to the industry and audience.
3. Manage Marketing of MSMEs	3.1 Information on market and business needs is analyzed and market opportunities identified. 3.2 Marketing mix and components are evaluated. 3.3 Marketing mix for specific target market is determined. 3.4 Marketing mix is monitored and continual adjusted against marketing performance.
4. Manage Human Resources	4.1 ***Human resource rules, regulations law and procedures*** are identified and determined. 4.2 The existing human resource is audited, and gaps are identified. 4.3 Recruitment and selection are conducted based on the organizational requirements. 4.4 Selected candidates are oriented and placed for the appropriate position. 4.5 Appraisal of employees' performance is conducted. 4.6 Appraisal result is used for training and development, promotion, compensation, disciplinary measures and other purposes as required. 4.7 ***Employee relations*** are maintained.
5. Manage production and Operation	5.1 Production /operation plan is developed and implemented. 5.2 Required inputs are purchased and adequate inventories maintained. 5.3 Production /operation process is checked and controlled. 5.4 Quality control is applied and maintained.
6. Maintain financial records and use for decision making	6.1 The objective and benefits of financial records are discussed and understood. 6.2 Asset, liabilities and capital are identified and recorded. 6.3 Balance sheet and different journals are discussed. 6.4 Business transactions are discussed, analyzed, classified and recorded.

	6.5 Daily financial records are maintained correctly in accordance with legal and accounting requirements. 6.6 Invoices and payments are prepared and distributed in timely manner and in accordance with legal requirements. 6.7 Outstanding accounts are collected or followed-up. 6.8 Revenue, expense and costs are identified and discussed. 6.9 Different ledgers and subsidiary ledgers are discussed and maintained. 6.10 Profit and loss report is prepared. 6.11 Financial interpretation is conducted with assistant from the appropriate person. 6.12 Financial manual is prepared.
7. Monitor, Manage and Evaluate work performance	7.1 People, resources and/or equipment are coordinated to provide optimum results. 7.2 Staff, clients and/or contractors are communicated within a clear and regular manner, to monitor work in relation to ***business goals*** or timelines. 7.3 ***Problem solving techniques*** are applied to work situations to overcome difficulties and achieve positive outcomes. 7.4 Opportunities for improvements are monitored according to business demands. 7.5 Work schedules are adjusted to incorporate necessary modifications to existing work and routines or changing needs and requirements. 7.6 Proposed changes are clearly communicated and recorded to aid in future planning and evaluation. 7.7 Relevant codes of practice are used to guide an ethical approach to workplace practices and decisions.

Variable	**Range**
Major components of work plan	May include but is not limited to: • Objective • Responsibilities • Resources (human, materials, finance, time, etc) • Activities
Resources	May include but is not limited to: • Human resource • Money

	• Time • Machines • Equipment • Space
Time management strategies	May include but is not limited to: • 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 but is not limited to: • Staff and colleagues • Management, supervisors, advisors or head office • Relevant professionals such as lawyers, accountants, management consultants • Professional associations
Human resource rules , regulations law and procedures	May include but is not limited to: • Recruitment and selection • Orientation and placement • Training and development • Performance appraisal and reward system • Disciplinary procedures • Movement and separation • Industrial relation
Employee relations	May include but is not limited to: • Relationship within employees • Relationship among employees and management and labor union • Relationship between labor union and government
Business goals	May include but is not limited to: • Sales targets • Budgetary targets • Team and individual goals • Production targets • Reporting deadlines
Problem solving techniques	May include but is not limited to: • Brainstorming • Fish bone • Focus group discussion • Problem tree

Evidence Guide	
Critical Aspects of Competence	A person must be able to demonstrate: • Ability to identify daily work requirements and allocate work appropriately

	• Ability to interpret financial documents in accordance with legal requirements • The ability to prepare strategic plan • The ability to develop effective work habit • The ability to manage marketing of MSEs • The ability to manage human resources of MSEs • the ability to manage production/operation of MSEs • The ability to maintain financial records of MSEs • The ability to manage, monitor and evaluate work performance of MSMEs
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • Strategic plan • Working culture • Time management strategy • Marketing Mix • Relevant marketing, operation/production, human resource and financial management • Human resource functions • Production/operation functions • Monitoring and evaluation • Problem solving techniques • Federal and Local Government legislative requirements affecting business operations, especially in regard to OHS, equal employment opportunity, industrial relations and anti-discrimination • Relevant industry code of practice • Planning techniques to establish realistic timelines and priorities • Identification of relevant performance measures • Quality assurance principles and methods
Underpinning Skills	Demonstrate skills to: • Technical or specialist skills relevant to the business operation • Interpret legal requirements, company policies and procedures and immediate, day-to-day demands • Strategic planning skills • Human relation skills • Communicate using questioning, clarifying, reporting, and giving and receiving constructive feedback • Numeracy skills for performance information, setting targets and interpreting financial documents and reports • Technical skills to interpret business document, reports and financial statements and projections • Relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities • Solve problem and develop contingency plans

	• Using computers and software packages to record and manage data and to produce reports • Evaluate using assessment work and outcomes • Observe for identifying appropriate people, resources and to monitor work
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Train Electrical/Electronic Assembly Supervision Level IV	
Unit Title	**Apply Problem Solving Techniques and Tools**
Unit Code	**IND TES4 14 0117**
Unit Descriptor	This unit of competency covers the knowledge, skills and attitude required to apply scientific problem solving techniques and tools to enhance quality, productivity and other kaizen elements on continual basis.

Elements	Performance criteria
1. Identify and select theme/problem.	1.1 ***Safety requirements*** are followed in accordance with safety plans and procedures. 1.2 All possible problems related to the process /Kaizen elements are listed using ***statistical tools and techniques***. 1.3 All possible problems related to kaizen elements are identified and listed on Visual Management Board/Kaizen Board. 1.4 Problems are classified based on obviousness of cause and action. 1.5 Critical factors like the number of customers affected, Potentials for bottlenecks, and number of complaints etc… is selected. 1.6 Problems related to priorities of ***Kaizen Elements*** are given due emphasis and selected.
2. Grasp current status and set goal.	2.1 The extent of the problem is defined. 2.2 Appropriate and achievable goal is set.
3. Establish activity plan. •	3.1 The problem is confirmed. 3.2 High priority problem is selected. 3.3 The extent of the problem is defined. 3.4 Activity plan is established as per ***5W1H***.
4. Analyze causes of a problem.	4.1 All possible causes of a problem are listed. 4.2 Cause relationships are analyzed using***4M1E***. 4.3 Causes of the problems are identified. 4.4 Root causes are selected. 4.5 The root cause which is most directly related to the problem is selected. 4.6 All possible ways are listed using ***creative idea generation*** to eliminate the most critical root cause.

	4.7 The suggested solutions are carefully tested and evaluated for potential complications. 4.8 Detailed summaries of the action plan are prepared to implement the suggested solution.
5. Examine countermeasures and their implementation.	5.1 Action plan is implemented by ***medium KPT*** members. 5.2 Implementation is monitored according to the agreed procedure and activities are checked with preset plan.
6. Assess effectiveness of the solution.	6.1 ***Tangible and intangible results*** are identified. 6.2 The results are verified over time. 6.3 Tangible results are compared with targets using ***various types of diagram***.
7. Standardize and sustain operation.	7.1 If the goal is achieved, the new procedures are standardized and made part of daily activities. 7.2 All employees are trained on the new ***Standard Operating Procedures (SOPs)***. 7.3 SOP is verified and followed by all employees. 7.4 The next problem is selected to be tackled by the team.

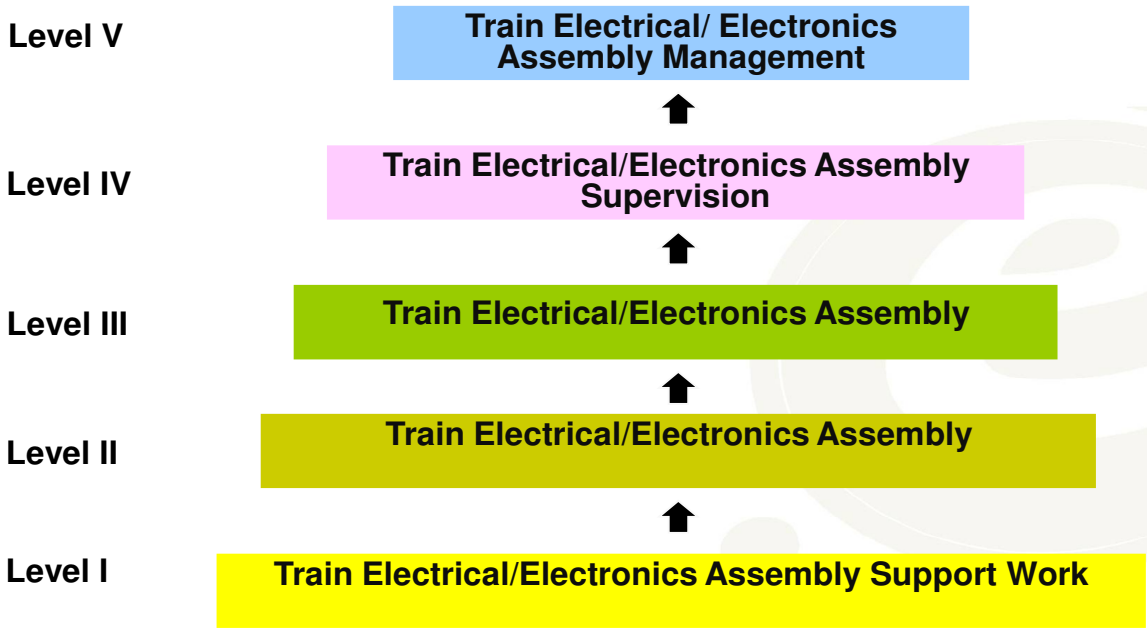
Variables	**Range**
Safety requirements	• may include but not limited to: • OHS requirements include legislation, material safety, managements system, hazardous substances and dangerous goods code and local safe operating procedures • Work is carried out in accordance with legislative obligations, environmental legislations, relevant health regulation, manual handling procedure and organization insurance requirements
Statistical tools and techniques	• may include but not limited to: • 7 QC tools may include: ➢ Stratification ➢ Pareto Diagram ➢ Cause and Effect Diagram ➢ Check Sheet ➢ Control Chart/Graph ➢ Histogram ➢ Scatter Diagram • QC techniques may include: ➢ Brain storming ➢ Why analysis ➢ What if analysis ➢ 5W1H
Kaizen Elements	• may include but not limited to: • Quality

	• Cost • Productivity • Delivery • Safety • Moral • Environment and Gender equality
5W1H	• may include but not limited to: • Who: person in charge • Why: objective • What: item to be implemented • Where: location • When: time frame • How: method
4M1E	• may include but not limited to: • Man • Machine • Method • Material and • Environment
Creative idea generation	• may include but not limited to: • Brainstorming • Exploring and examining ideas in varied ways • Elaborating and extrapolating • Conceptualizing
Medium KPT	• may include but not limited to: • 5S • 4M (Machine, Method, Material and Man) • 4p (Policy, Procedures, People and Plant) • PDCA cycle • Basics of IE tools and techniques
Tangible and intangible results	• may include but not limited to: • Tangible result may include quantifiable data • Intangible result may include qualitative data
Various types of diagram	• may include but not limited to: • Line graph • Bar graph • Pie-chart • Scatter and Affinity diagrams
Standard Operating Procedures (SOPs)	• may include but not limited to: • The customer demand • The most efficient work routine (steps) • The cycle times required to complete work elements • All process quality checks required to minimize defects/errors • The exact amount of work in process required

Evidence Guide	
Critical Aspects of Assessment	Demonstrates skills and knowledge competencies to: • Apply all relevant procedures and regulatory requirements to ensure quality and productivity of an organization. • Detect non-conforming products/services in the work area • Apply effective problem solving approaches/strategies. • Implement and monitor improved practices and procedures • Apply statistical quality control tools and techniques.
Underpinning Knowledge and Attitude	Demonstrates knowledge of: • QC story/PDCA cycle/ • QC story/ Problem solving steps • QCC techniques • 7 QC tools • Basic IE tools and techniques. • SOP • Quality requirements associated with the individual's job function and/or work area • Workplace procedures associated with the candidate's regular technical duties • Relevant health, safety and environment requirements • organizational structure of the enterprise • Lines of communication • Methods of making/recommending improvements. • Reporting procedures
Underpinning Skills	Demonstrates skills to: • Apply problem solving techniques and tools • Apply statistical analysis tools • Apply Visual Management Board/Kaizen Board. • Detect non-conforming products or services in the work area • Document and report information about quality, productivity and other kaizen elements. • Contribute effectively within a team to recognize and recommend improvements in quality, productivity and other kaizen elements. • Implement and monitor improved practices and procedures. • Organize and prioritize activities and items. • Read and interpret documents describing procedures • Record activities and results against templates and other prescribed formats.
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.

Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

ELECTRICAL/ELECTRONICS ASSEMBLY



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