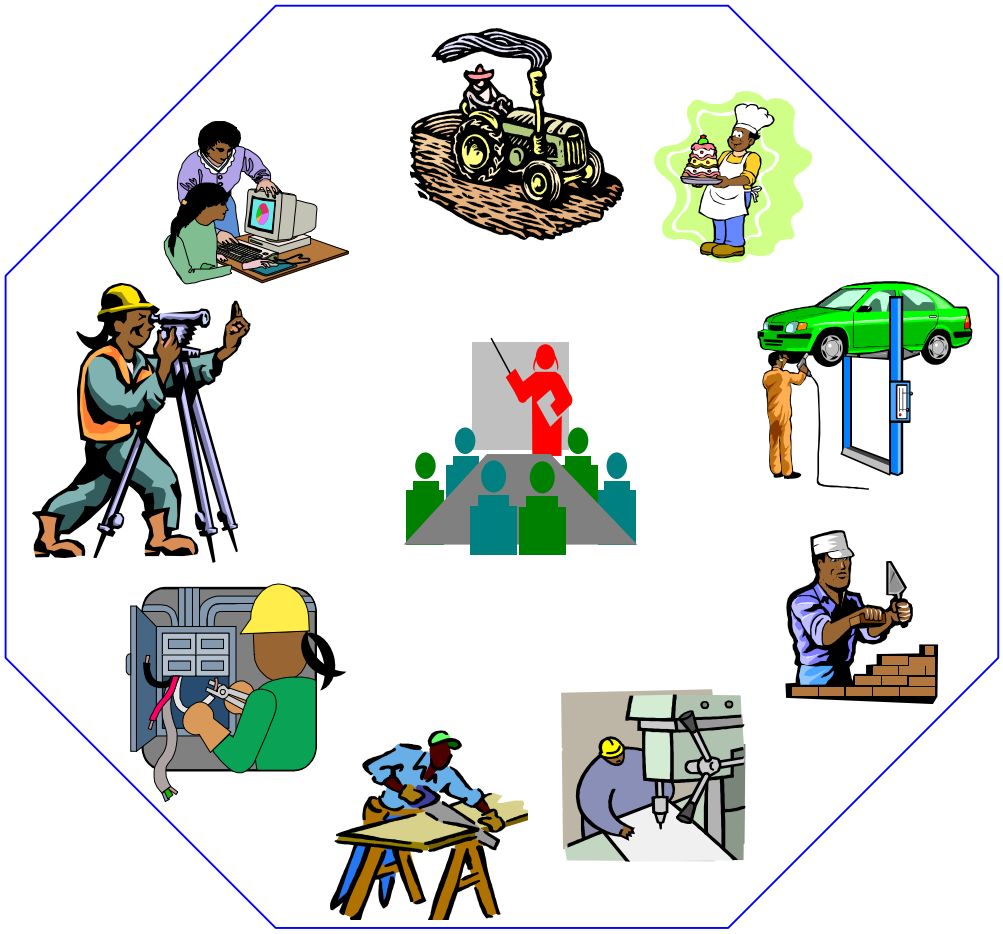
Federal Democratic Republic of Ethiopia

OCCUPATIONAL STANDARD

TRAIN ELECTRICAL/ ELECTRONICS ASSEMBLY MANAGEMENT

NTQF Level V



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 of Competence 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 Management		
Occupational Code: IND TEM5		
NTQF Level V		
IND TEM5 01 0117 Ensure a Safe Workplace	**IND TEM5 02 0117** Manage Environmental Sustainable in Electrical Work Activities	**IND TEM5 03 0117** Manage Environmental Sustainable in Electrical Work Activities
IND TEM5 04 0117 Build and Sustain an Innovative Work Environment	**IND TEM5 05 0117** Participate in the Development of Personal Competency Development Plan	**IND TEM5 06 0117** Provide Instruction and Solutions for General Computational Problems
IND TEM5 07 0117 Estimate Electrical Projects	**IND TEM5 08 0117** Facilitate the Development Programs in Supervisory Control and Data Acquisition	**IND TEM5 09 0117** Assess Energy Loads & Manage Environmental Compliance in Electrical Workplace
IND TEM5 10 0117 Manage Project Quality	**IND TEM5 11 0117** Facilitate and Capitalize on Change and Innovation	**IND TEM5 12 0117** Facilitate and Capitalize on Change and Innovation

Occupational Standard: Train Electrical/Electronic Assembly Management Level V	
Unit Title	**Ensure a Safe Workplace**
Unit Code	**IND TEM5 01 0117**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to establish, maintain and evaluate the organisation's Work Health and Safety (WHS) policies, procedures and programs in the relevant work area according to WHS legislative requirements.

Element	Performance Criteria
1. Establish and analyse WHS management system	1.1 WHS policies that clearly define the organisation's commitment to complying with ***WHS legislation*** are located, adapted, adopted and communicated 1.2 ***Duty holders*** are identified and WHS responsibilities for all workplace personnel defined according to WHS legislation, policies, procedures and programs 1.3 Financial and human resources required by the WHS Management System (WHSMS) are identified and approved
2. Establish and analyse effective and compliant participation arrangements for managing WHS	2.1 Participation arrangements are worked with workers and their representatives to set up and analyse according to relevant WHS legislation 2.2 Issues raised are appropriately resolved through participation and consultation arrangements according to relevant WHS legislation 2.3 Information about the outcomes of participation is promptly provided and consultation to workers and ensured it is easy for them to access and understand
3. Establish and analyse procedures for effectively identifying hazards, and assessing and controlling risks	3.1 Procedures are developed for ongoing hazard identification, and assessment and ***control of associated risks*** 3.2 Hazard identification is included at the planning, design and evaluation stages of any change in the workplace to ensure that new hazards are not created by the proposed changes and existing hazards are controlled 3.3 Procedures are developed and analysed for selecting and implementing risk controls according to the hierarchy of control and WHS legislative requirements 3.4 Inadequacies in existing risk controls are identified according to the hierarchy of control and WHS legislative requirements, and promptly provide resources to enable implementation of new measures

	3.5 Requirements are identified and requested for expert WHS advice, as required
4. Evaluate and analyse WHS management system	4.1 WHS induction and training program are developed and provided for all workers as part of the organisation's training program 4.2 A system is used for ***WHS recordkeeping*** to allow identification of patterns of occupational injury and disease in the organisation, and to maintain a record of WHS decisions made, including reasons for the decision 4.3 The WHSMS is measured and evaluated in line with the organisation's quality systems framework 4.4 Improvements are developed and implemented to the WHSMS to achieve organisational WHS objectives 4.5 Compliance is ensured with the WHS legislative framework so that, as a minimum, WHS legal requirements are achieved

Variable	Range
WHS legislation	May include but not limited to: • applicable commonwealth and state or territory WHS Acts, regulations and codes of practice • common law duties to meet general duty of care requirements • WHS legislative and regulatory requirements for: • effectively managing hazards • establishing consultation arrangements, including those for health and safety representatives and health and safety committees • providing information and training, including training in safe operating procedures; procedures for workplace hazards; hazard identification, risk assessment and risk control; and emergency and evacuation procedures • WHS legislative, regulatory and other requirements for the maintenance and confidentiality of records of occupational injury and disease.
Duty holders	May include but not limited to: • officers • PCBUs or their officers • workers and other persons at a workplace.
Control of associated risks	May include but not limited to: • administrative • as specified in WHS Acts, regulations and codes of practice • counselling/disciplinary processes, such as those associated with alcohol and other drugs

	• education about alcohol and other drugs work-related issues • engineering • hazard elimination • housekeeping and storage • issue resolution • personal protective equipment • purchasing of supplies and equipment • workplace inspections, including plant and equipment.
WHS recordkeeping	May include but not limited to: • audit and inspection reports • consultation, such as: ➢ meetings of health and safety committees ➢ work team meeting agendas, including WHS items and actions • first aid/medical post records • hazardous chemicals registers • induction, instruction and training • manufacturer and supplier information, including dangerous goods storage lists • plant and equipment maintenance and testing reports • workers' compensation and rehabilitation records • workplace environmental monitoring records.

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • relevant WHS Acts, regulations and codes of practice that apply to the business operation • information technology skills to store and retrieve relevant workplace information and data • communication skills to consult with staff and to promote a safe workplace
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • hazard identification and risk-management processes • hierarchy of risk control • in-house and WHS legislative reporting requirements
Underpinning Skills	Demonstrate skills of: • analytical and problem solving skills to examine relevant workplace information and data to identify hazards, and to assess and control risks • literacy skills to adapt and communicate WHS policies that reflect WHS legislative requirements • Problem-solving skills to deal with complex and no routine difficulties.
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 Management Level V	
Unit Title	**Manage Environmental Sustainable in Electrical Work Activities**
Unit Code	**IND TEM5 02 0117**
Unit Descriptor	This unit of competency covers the competence to plan and implement management system that ensures the protection of the working environments in electrical systems of train manufacturing. It makes suitable situations for sustainable electrical work activities on the train manufacturing workshop.

Element	Performance criteria
1. Plan and manage compliance with environmental regulations	1.1 Reasons are identified for ethical environmental practice in a workplace or business 1.2 Environmental responsibilities of employers and employees are identified in an automotive workplace or business 1.3 Penalties is considered for enterprise and individual faults or mistakes which as breach of the legislation are identified 1.4 Waste products are minimised and facilities provided for waste materials to be stored in garbags for recycling or removing 1.5 Collection and recycling arrangements are implemented for liquids, solids and other waste 1.6 Suppliers with minimal excess packaging on goods received are sourced and packaging on goods received is sorted and disposed of appropriately 1.7 ***Work procedures*** waste and energy conservation strategies are identified and implemented
2. Manage potential hazards to stormwater system to avoid contamination	2.1 Systems are established to ensure wastewater does not enter the stormwater system 2.2 All drains and flows are identified on a worksite map directly indicating where they flow 2.3 Trade waste permits are kept in place 2.4 Spill kit is provided and used to prevent stormwater contamination 2.5 ***Tools and equipments*** are identified for ***personal protection*** 2.6 Workplace is kept clean to prevent unintentional stormwater pollution

3. Manage potential hazards to air quality to avoid contamination	3.1 Hazards of airborne particles are identified, minimised and contained 3.2 Hazards of gases and fumes are identified, minimised and contained 3.3 A well-ventilated area is provided for any welding activities
4. Minimisation of noise hazards is planned and managed	4.1 Noise creating activities are minimised and carried out within approved operating hours 4.2 Fixed machinery is fitted with silencers or surrounded by noise containment material
5. Management systems	5.1 An environmental policy, contingency plan, ***information and documentation*** suitable to the needs of the business are developed and implemented 5.2 Waste to landfill is calculated and possible savings are calculated through reuse and recycling 5.3 Payback period on environmental equipment is calculated 5.4 Staff adherence is managed to environmental responsibilities 5.5 Environmental documents are maintained and stored securely in a form accessible for reporting procedures

Variable	Range
Work procedures	May include but not limited to: • WHS legislation, Material Safety Data Sheets (MSDS), hazardous substances and dangerous goods code and local safe operating procedures • legislative obligations, environmental legislation, health regulations, and manual handling procedures and organisation insurance requirements
Tools and equipment	May include but not limited to: • spill kits, recycling bins
Personal protection	to include that prescribed under legislation, regulations and enterprise policies and practices
Information and documentation	May include but not limited to: • environmental legislation, regulations and advice • workplace procedures relating to the use of tools and equipment • work instructions and procedures • worksite environmental policy • workplace procedures relating to reporting and communication • manufacturer/component supplier specifications and operational procedures

	• local council and waterways regulations • MSDS, environmental documents, manufacturer/component supplier specifications, costing of equipment and waste removal • staff environmental induction material

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • ideas and information to ensure all work undertaken is in accordance with environmental best practice, support from stakeholders is actively sought for implementing suitable innovation and continuous improvement • collect, organise and understand information related to environmental procedures from legislation, regulations, policies, guidelines, standards and workplace best practices in an automotive business • communicate
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • aspects of environmental legislation and its relationship with Workplace Health and Safety (WHS), finance and risk management • requirements for trade waste permits • spill clean-up procedures • characteristics and potential environmental impact of products used in the business • philosophy of sustainability through prevention, reuse, reduce and recycle • procedures for rectifying machinery faults and material defects • actions to be taken in case of environmental threat in the workplace • reporting procedures for environmental damage occurring in the workplace • cleaner production and eco-efficient strategies to avoid the production of waste
Underpinning Skills	Demonstrate skills to: • plan and organise activities including the preparation of equipment and materials recycling and waste management systems and the selection of worksite to avoid environmental contamination, back tracking, workflow interruptions or wastage • promote work with others and in a team by recognising dependencies and using cooperative approaches to minimise wastage, optimise workflow and productivity • use mathematical ideas and techniques to complete measurements and estimate material requirements required for the work and calculate wastage rates of

	various methods • use planning, checking and inspection techniques to avoid environmental contamination and wastage • use the workplace technology related to environmental protection and recycling equipment
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 Management Level V	
Unit Title	**Manage People Performance and Ensure Team Effectiveness**
Unit Code	**IND TEM5 03 0117**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to manage the performance of staff who report to them directly. Development of key result areas and key performance indicators and standards, coupled with regular and timely coaching and feedback, provide the basis for performance management.

Element	Performance criteria
1. Allocate work	1.1. Relevant groups and individuals on work to be allocated and resources available are consulted. 1.2. Work plans are developed in accordance with operational plans 1.3. Work is allocated in a way that is efficient, cost effective and outcome focussed 1.4. ***Performance standards***, ***Code of Conduct*** and work outputs are confirmed with relevant teams and individuals 1.5. ***Performance indicators*** are developed and agreed with relevant staff prior to commencement of work 1.6. ***Risk analysis*** is conducted in accordance with the organisational risk management plan and legal requirements
2. Assess performance	2.1. ***Performance management*** is designed and processes are reviewed to ensure consistency with organisational objectives and policies 2.2. Participants are trained in the performance management and review process 2.3. Performance management is conducted in accordance with organisational protocols and time lines 2.4. Performance is monitored and evaluated on a continuous basis
3. Provide feedback	3.1. Informal feedback is provided to staff on a regular basis 3.2. Relevant people is advised where there is poor performance and take necessary actions 3.3. On-the-job coaching is provided when necessary to improve performance and confirm ***excellence in performance***

	3.4. Performance is documented in accordance with the organisational performance management system 3.5. Formal structured feedback sessions are conducted as necessary and in accordance with organisational policy
4. Manage follow up	4.1. Performance improvement and development plans are written and agreed in accordance with organisational policies 4.2. Assistance is sought from human resources specialists where appropriate 4.3. Excellence in performance is reinforced through recognition and continuous feedback 4.4. Individuals are monitored and coached with poor performance 4.5. Support services are provided where necessary 4.6. Individuals who continue to perform below expectations are counselled and the disciplinary process is implemented if necessary 4.7. Staff is ***terminated*** in accordance with legal and organisational requirements where serious misconduct occurs or ongoing poor-performance continues

Variable	Range
Performance standards	May include but not limited to: • level of performance sought from an individual or group which may be expressed either quantitatively or qualitatively
Code of Conduct	May include but not limited to: • agreed (or decreed) set of rules relating to employee behaviour/conduct with other employees or an agreed (or decreed) set of rules relating to employee behaviour/conduct with other employees or customers
Performance indicators	May include but not limited to: • measures against which performance outcomes are gauged
Risk analysis	May include but not limited to: • determination of the likelihood of a negative event preventing the organisation meeting its objectives and the likely consequences of such an event on organisational performance
Performance management	May include but not limited to: • in accordance with relevant industrial agreements • process or set of processes for establishing a shared understanding of what an individual or group is to

	achieve, and managing and developing individuals in a way which increases the probability it will be achieved in both the short- and long-term
Excellence in performance	May include but not limited to: • regularly and consistently exceeding the performance targets established while meeting the organisation's performance standards
Terminating	May include but not limited to: • cessation of the contract of employment between an employer and an employee, at the initiative of the employer within relevant industrial agreements

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • relevant awards and certified agreements • unlawful dismissal rules and due process • Staff development options and information • performance measurement systems utilised within the organisation
Underpinning Skills	Demonstrate skills of: • risk management skills to analyse, identify and develop mitigation strategies for identified risks • Planning and organisation skills to ensure a planned and objective approach to the performance management system. • communication skills to articulate expected standards of performance, to provide effective feedback and to coach staff who need development
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 Management Level V	
Unit Title	**Build and Sustain an Innovative Work Environment**
Unit Code	**IND TEM5 04 0117**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to create an environment that enables and supports the application of innovative practice and electrical system modification in train manufacturing.

Element	Performance Criteria
1. Lead innovation by example	1.1. Innovation is made as an integral part of ***leadership and management activities***
	1.2. Positive reception of ideas is demonstrated from others and provide constructive advice
	1.3. Relationships are established and maintained based on mutual respect and trust between individual workers and industrial work managers
	1.4. Considered ***risks*** are taken to open up opportunities for innovation
	1.5. Own approaches are regularly evaluated for consistency with the wider organisational or project context
2. Establish work practices that support innovation	2.1. ***Working conditions*** that reflect and encourage innovative practice are consulted on and established
	2.2. ***workplace procedures*** that foster innovation are introduced, maintained and allowed for rigorous ***evaluation of innovative ideas***
	2.3. Facilitate and participate in ***collaborative work arrangements*** to foster innovation
	2.4. Teams are built and lead to work in ***ways that maximise opportunities for innovation***
3. Promote innovation	3.1. Suggestions, improvements and innovations from all colleagues are acknowledged
	3.2. Appropriate ***ways of celebrating and promoting innovation*** are found
	3.3. The value of innovation is promoted and reinforced according to the vision and objectives of the organisation or project
	3.4. The evaluation of innovative ideas is promoted and supported within the wider organisational or project context

4. Create a physical environment which supports innovation	4.1. The ***impact of the physical environment*** in relation to innovation is evaluated 4.2. Enhancing the physical work environment is collaborated with colleagues about ideas before taking action 4.3. Potential for supporting innovation is considered when selecting physical resources and equipment 4.4. Workspaces are designed, fitted-out and decorated to encourage creative mindsets, collaborative working and the development of positive workplace relationships
5. Provide learning opportunities	5.1. Relevant information, knowledge and skills are pro-actively shared with colleagues 5.2. ***Formal and informal learning opportunities*** are provided or encouraged to help develop the skills needed for innovation 5.3. Opportunities in which individuals can learn from the experience of others are created

Variable	Range
Leadership and management activities	May include but not limited: • people management practices • planning processes • regular management meetings • review processes
Risks	May include but not limited: • budgetary issues • challenging changes in relationships, work practices and general workplace climate • unforseen impacts of innovative ideas
Working conditions	May include but not limited: • family-friendly leave entitlements • flexible working hours • social leave • study leave • time provided for coming up with ideas
Workplace procedures	May include but not limited: • briefing processes • client relations • performance management • project management • staff meetings and training
Evaluation of innovative ideas	May include but not limited: • analysing consistency with overall goals, values or vision

	• assessing resource requirements and practicalities • assessing the potential to find 'champions' or supporters • evaluating the external factors that may impact on the idea • exploring the implications of ideas that may stretch or change existing ways of doing things
Collaborative work arrangements	May include but not limited: • cross section • vertical teams • within a section • working with supplier organisations or partner organisations
Ways that maximise opportunities for innovation	May include but not limited: • collaborating • collecting data • creative thinking • future scanning • getting feedback • making suggestions • networking
Ways of celebrating and promoting innovation	May include but not limited: • congratulating the project team • ensuring management acknowledgment • providing a newsletter story about the idea • using the idea to help foster other ideas • well-planned group incentive schemes
Impact of the physical environment	May include but not limited: • eating areas • extent to which design or style links with declared philosophies or objectives • external areas • general ambience of the work environment • location of different people • presence and ambience of relaxation areas • style of dÃ©cor • use of creative messages or images in the workplace • workspace design and dÃ©cor • workstation arrangements and opportunities for interaction
Formal and informal learning opportunities	May include but not limited: • Coaching • conferences • formal training courses/programs • information seminars • job rotation • mentoring and online learning

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • communication, consultation and negotiation skills to model and lead, open and collaborative relationships • benefits of providing coaching and learning opportunities in relation to innovation • concept of innovation, what it is and what it means for different people either working independently or within an organisation
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • context for innovation in the relevant workplace context including core business values, overall objectives, broader environmental context and the need to ensure the value and benefit of innovative ideas and projects • different ways of rewarding performance • factors and tools that can motivate individuals to use creative thinking and apply innovative work practices • legislative framework that impacts on operations in the relevant workplace context • management principles and leadership styles, including the impact of different approaches on innovation • typical challenges and barriers to innovation within teams and organisations, and ways of overcoming these • Ways in which workplace climate can affect individual attitudes and performance.
Underpinning Skills	Demonstrate skills in: • comprehension skills to interpret and develop information that may deal with complex ideas and relate to issues both within and outside a given workplace context • planning and organisational skills to implement wide-ranging practical processes and procedures that support innovation • problem-solving skills to assess and respond to challenges and risks around innovation at an operational management level • Self-management and learning skills to evaluate and enhance personal effectiveness, and to promote a culture of ongoing learning and development.
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 Management Level V	
Unit Title	**Participate in the Development of Personal Competency Development Plan**
Unit Code	**IND TEM5 05 0117**
Unit Descriptor	This unit covers the application of skills and knowledge in taking responsibility for one's own competency development. It encompasses understanding the structure of a competency development plan, participating the development of a personal competency development plan, understanding responsibilities and obligation under competency development plan, following activities for developing competency, self-monitoring competency development and meeting trainee obligations for periodic reporting of competency development activities.

Element	Performance Criteria
1. Participate in the development of a personal competency development plan.	1.1 The nature of competency-based training is sought from discussions with appropriate persons and understood. 1.2 The responsibilities/obligations of trainees/learners, their employers, trainers and assessors in a competency-based development program are sought from discussions with appropriate persons and understood. 1.3 Competencies to be achieved in ***attributes on personal competency development*** plan are established in discussions with appropriate persons. 1.4 Details on how to achieve the individual competencies in the plan are sought from discussions with appropriate persons and understood.
2. Follow a personal competency development plan.	2.1 All aspects of the competency development plan are put into practice and followed diligently. 2.2 Opportunities to practise skills and apply knowledge relative to a particular competency are pursued 2.3 Assistance is sought from appropriate persons to overcome difficulties in develop skills and apply knowledge relevant to a particular competency. 2.4 Progress in competency development is self monitored against the competency development plan. 2.5 Modifications to the personal competency development plan are made in consultation with appropriate persons. 2.6 ***Device used in personal competency development plan*** should be available in appropriate way in the work environment.

	2.7 Trainee/learners responsibility for periodic and timely reporting of competency development activities is followed.

Variable	Range
Attributes on personal competency development	May include but not limited: • responsibility for one's own competency development in developing and applying skills and knowledge • structure of a competency development plan • development of a personal competency development plan participation • responsibilities and obligation under the competency development plan • activities for developing competency followed • competency development self-monitoring • trainee obligations met • periodic reporting of competency development activities met
Device used in personal competency development plan	May include but not limited: • Automation technologies • Computers • Data Communications • Electrical • Electrical Machines • Electronics • Fire protection • Instrumentation • Refrigeration and Air Conditioning • Renewable / sustainable energy • Security technology

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • Seeking and understanding the responsibilities under a competency development plan. • Seeking and understanding how to achieve the individual competencies in the plan. • Following all aspects of the plan diligently. • Pursuing opportunities to develop competency. • Seeking assistance to overcome difficulties in developing competency. • Self-monitoring competency development. • Periodically reporting competency development activities.
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • Competency Development (Training) Plans encompassing:

	➢ state/territories requirements (acts/regulations) ➢ competency development (training) contracts ➢ competency development (training) period ➢ purpose of competency development (training) plans ➢ process in developing competency development (training) plans ➢ parties involved in the competency development (training) plan • Qualification Structure encompassing: ➢ scope of work ➢ Training Packages - electro technology ➢ Competency Standard Units (CSUs) ➢ structure of Qualification ➢ off-Job Requirements ➢ on-Job Requirements • Responsibilities of Parties to the contract encompassing: ➢ employer responsibilities ➢ learner responsibilities ➢ RTO responsibilities ➢ State Training Authorities (STA)
Underpinning Skills	Demonstrate skills of: • Electrical activities of Industry Career Opportunities encompassing: ➢ industry Areas ➢ qualification levels ➢ career paths • Industry customs and practices encompassing: ➢ industry bodies – employer and employee representatives ➢ regulatory bodies – including licensing/registration, OHS, IR, training authorities – apprentice/trainee regulation • Monitoring of Workplace Evidence encompassing: ➢ workplace exposure and practices and relationship with competency standard units ➢ methods of collecting workplace evidence ➢ monitoring period cycle ➢ requirements of workplace evidence ➢ actions taken for unsatisfactory progression ➢ apprentice/learner responsibilities ➢ employer responsibilities • RTO Policies encompassing: ➢ apprentice/Learner Responsibilities ➢ teachers/Trainers Responsibilities

	➢ absenteeism ➢ off-Job component assessment specifications ➢ on-Job component assessment specifications ➢ qualification completion requirements and award ➢ advanced standing and/or RPL ➢ result review procedures • Apprentice/Learner Discipline Policy encompassing: ➢ apprentices/Learners rights ➢ apprentice/Learner responsibilities ➢ breaches of discipline ➢ types of penalties Apprentice/Learner Responsibilities • Attendance at the Vocational and Technical Education Centre encompassing: ➢ importance of attendance ➢ record management of attendance ➢ attendance cards ➢ advice to employer of absences • Fire and Emergencies at the Vocational and Technical Education Centre encompassing: ➢ designated fire and emergency exists ➢ procedures in the event of a fire ➢ evacuation procedures ➢ assembly points importance of attendance • Occupational Health and Safety at the Vocational and Technical Education Centre encompassing: ➢ eye protection ➢ foot protection ➢ protective clothing ➢ personal injuries ➢ mobile phones and personal belonging ➢ dress regulations ➢ rotating machinery, designated fire and emergency exists • Entry Requirements encompassing: ➢ numeracy requirements ➢ literacy requirements ➢ vocational and technical education centre support mechanisms ➢ testing and appropriate action by learner Eye protection • Vocational and Technical Education Centre Tour encompassing: ➢ vocational and technical education centre layout ➢ building layout ➢ tour of building and vocational and technical education centre

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 Management Level V	
Unit Title	**Provide Instruction and Solutions for General Computational Problems**
Unit Code	**IND TEM5 06 0117**
Unit Descriptor	This unit covers the application of computational processes to solve engineering problems. It encompasses working safely, applying problem solving techniques, using a range of mathematical processes, providing solutions to electrical/electronic engineering problems and justifying such solutions. Typical engineering problems are those encountered in meeting requirements in a design brief, meeting performance requirements and compliance standards, revising systems operating parameters and dealing with system malfunctions.

Element	Performance Criteria
1. Provide computational solutions to engineering problems.	1.1 OHS procedures for a given work area are obtained and understood 1.2 The nature of the problems are obtained from documentation or from work supervisor to establish the scope of work to be undertaken 1.3 Problems are clearly stated in writing and/or diagrammatic form to ensure they are understood and appropriate methods used to resolve in the ***work environment***. 1.4 Known constants and variable related to the problem are obtained from measured values or problem documentation. 1.5 Alternative methods for resolving the problem are considered and where necessary discussed with appropriate person(s). 1.6 Problems are solved using appropriate mathematical processes and within the realistic accuracy.
2. Complete work and document problem solving activities	2.1 Justification for solutions used to solve engineering problems is documented for inclusion in work/project development records in accordance with professional standards. 2.2 Work completion is documented and appropriate person(s) notified.

Variable	Range
Work environment	May include but not limited: • This unit shall be demonstrated in relation to problems

	that apply to engineering diagnosis development and work functions with the following attributes:
Providing computational solutions to basic engineering problems	May include but not limited: • Computers • Data Communications • Electrical • Electronics • Instrumentation • Refrigeration and Air Conditioning

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • Estimations, errors and approximations • Errors in measurement • Maximum probable error • Show awareness of errors in measurement and of giving results in appropriate number of significant figures • Use estimations and approximations to check the reasonableness of results.
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • Rational, irrational numbers and basic algebra • simplification of expressions involving square roots and cube roots • scientific and engineering notation • evaluation of expressions using a calculator • convert units of physical quantities using unity brackets • substitute given values into formulae to find physical quantities • manipulate algebraic expressions using mathematical operations in their correct order, the laws of indices, expansion of brackets and collecting like terms • Laws of indices • Conversion between decimal notation, scientific notation and engineering notation • Laws of indices: positive /negative values, multiplication/division, fractional values, index equals zero • Logarithmic laws: multiply/divide • solution of exponential equations using logarithms, substitution and solution of relevant formulae involving exponents or logarithms • Graphs of exponential functions, 10x and ex and the inverses log10(x) and loge(x) functions on log-linear graphs • Convert numbers into scientific and engineering notation using the laws of indices

Underpinning Skills	Demonstrate skills of: • Algebraic manipulation: ➢ Factorise algebraic expressions using common factors ➢ Factorise quadratic expressions using trial and error on the factors of the coefficients ➢ Simplify algebraic fractions using common denominators and cancelling ➢ Solve simple one variable equations including algebraic fractions ➢ Find the quotient and remainder given a linear divisor. ➢ Transpose formulae to find a required variable. • Manipulate and simplify arithmetic and algebraic expressions using the laws of indices and logarithms: ➢ Express logarithms as indices. ➢ Perform logarithmic operations. ➢ Determine logarithms and antilogarithms to base 10, using a scientific calculator. ➢ Determine logarithms and antilogarithms to base e, using a scientific calculator. ➢ Convert logarithmic values from base 10 to base e and vice versa. ➢ Sketch given functions on log-linear graphs • Plane figures – triangles and basic trigonometry: ➢ Angles in a triangle ➢ Isosceles and equilateral triangles ➢ Congruent triangles ➢ Similar triangles ➢ Pythagoras' theorem ➢ Area of triangles ➢ Basic trigonometry functions ➢ Degrees, radians ➢ The ratios: sin, cos, tan, cosec, sec, cot. ➢ Inverse trig functions ➢ Sine and cosine rules • Plane figures - quadrilaterals and circles: ➢ Types and properties of quadrilaterals ➢ Areas and perimeters of regular quadrilaterals ➢ Lengths of arcs ➢ Angles in a circle - degrees ➢ Angles in a circle - radians ➢ Lengths of chord segments ➢ Tangents to circles ➢ Circumference and area of circles ➢ Names and characteristics of common polygons • Graphs of Trigonometric functions: ➢ Graph trigonometric functions and solve trigonometric equations.

	➢ Simplify trigonometric expressions using trigonometric identities ➢ Convert angular measure in degrees to radians and vice versa ➢ Graph trigonometric functions including graphs of y = sin x and y = cos x ➢ Using vocational applications of current or voltage as a function of time consider changes in amplitude, consider changes in frequency. ➢ Examine relationships of frequency, period and angular velocity. ➢ Sketch graphs of the form f(t) = a sin φt and f(t) = a cos φt, where a is the peak voltage or current, and φ is the angular velocity ➢ Solve graphically equations of the form f(t) = a sin φt and f(t) = a cos φt ➢ Show a positive or negative angle on the unit circle. ➢ Use symmetry properties to find trigonometric ratios for angles greater than π/2. ➢ Solve simple vocational problems relating period, frequency and angular velocity. • Graphs of linear functions: ➢ The number plane ➢ Gradient and x and y intercepts of a straight line ➢ Equation of a straight line length and mid-point of a straight line segment ➢ Function notation ➢ Simultaneous equations ➢ Graphical solutions ➢ Substitution ➢ Elimination ➢ Solve 2 linear simultaneous equations both algebraically and graphically. • Matrices: ➢ Perform the basic operations on matrices up to 3 x 3 ➢ Manipulate matrix equations and expressions ➢ Recognise inverse and identity matrices up to 3 x 3 and use to solve systems of linear equations. ➢ Find determinants up to 3 x 3 and use to solve systems of linear equations. ➢ Solve problems involving more than two simultaneous equations. ➢ State the limitations of graphical methods of solution. ➢ Distinguish between a matrix and an array. ➢ Describe the null, diagonal and unit matrix ➢ Describe and identify a singular/non-singular matrix • Quadratic functions:

	➢ Graphs of quadratic functions represented by parabolas and the significance of the leading coefficient. ➢ Graph quadratic functions and solve quadratic equations. ➢ Sketch and interpret the graphs of quadratic functions showing the significance of the leading coefficient and the zeros ➢ Solve quadratic equations by factoring or using quadratic formula ➢ Solve simultaneously linear and quadratic equations algebraically and geometrically ➢ Interpret verbally formulated problems involving quadratic and linear equations and solve. • Exponential and logarithmic functions: ➢ Transform non-linear functions (including exponential) to linear forms and plot data. ➢ Draw curves of best fit, interpolate data and estimate constants in suggested relationships. ➢ Interpret verbally formulated problems involving growth and decay, and solve. ➢ Graph exponential and logarithmic functions and solve exponential and logarithmic equations. ➢ Sketch the graphs of simple exponential and logarithmic functions showing behaviour for large and small values • Vectors and Phasers: ➢ The vector as an expression of magnitude and direction ➢ The vector sum of x and y values in terms of magnitude and direction ➢ Rectangular components of vectors in the form $x = r \cos \theta$ and $y = r \sin \theta$ ➢ Rectangular-polar and polar-rectangular conversion ➢ Vector addition and subtraction ➢ Express rectangular components of vectors in the form $x = r \cos \theta$ and $y = r \sin \theta$ • Complex numbers: ➢ Definitions and notation of complex numbers ➢ Complex numbers as vectors on an Argand diagram ➢ Laws of complex numbers and apply the laws in suitable calculations. ➢ Plot complex numbers on the Argand plane. ➢ Express vectors as complex numbers and perform suitable calculations. ➢ Calculate the conjugate of a complex number. ➢ Using a calculator for rectangular-polar and polar-rectangular conversions.

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 Management Level V	
Unit Title	**Estimate Electrical Projects**
Unit Code	**IND TEM5 07 0117**
Unit Descriptor	This unit covers estimate material and labour costs for competitive quotation/tenders for work. It encompasses reading and understanding job specifications, material take-offs, determining labour and site requirements, costing and documenting.

Element	Performance Criteria
1. Ascertain the extent of the project.	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 the project is established from design brief, specification and/or other relevant documentation and from discussions with appropriate person(s). 1.4 A date by which the estimate is to be completed is determined from design brief, specification and/or other relevant documentation and from discussions with appropriate person(s). 1.5 Activities are planned to meet scheduled timeframe in consultation with others involved in the work.
2. Estimate project.	2.1 Material take-offs are performed accurately and checked against job specifications. 2.2 Materials, labour and other costs are determined from industry standard labour rates, enterprise costing arrangements and /or material suppliers. 2.3 Sources and availability of materials and human resources needed for the project are established in accordance with organisation policies and procedures. 2.4 Estimates are checked and revised where necessary, for accuracy in costing and against job specification, in consultation with appropriate person(s). 2.5 Solutions to unplanned events are implemented consistent with enterprise policy. 2.6 ***Electrical train job applications*** are ordered and checked in accordance with its work environment.
3. Document and submit quotation.	3.1 Project estimates are documented in accordance with established policies and procedures. 3.2 Quotation is forwarded to appropriate person(s) for inclusion in a submission within the specified

	timeframe. 3.3 Quotation documentation is filed in accordance with established policies and procedures.

Variable	Range
Electrical train job applications	Depend on: • 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 Competence	Must demonstrate knowledge and skills competence of: • Ascertaining the extent of the project accurately. • Planning estimation work effectively. • Estimating the job competitively. • Checking the estimates accurately. • Documenting the estimates clearly. • Dealing with unplanned events by drawing on essential knowledge and skills to provide
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • Labour rates method of costing • Life cycle costing analysis • Documenting estimations and costing. • Evaluating estimates and costs
Underpinning Skills	Demonstrate skills of: • Estimating electrical projects encompassing: ➢ Documents used in estimating ➢ Resources to be quantified and costed ➢ Material take-off methods • Costing: ➢ resource (labor, plant, equipment and materials) ➢ contingency ➢ money ➢ margins
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 Management Level V	
Unit Title	**Facilitate the Development Programs in Supervisory Control and Data Acquisition Systems**
Unit Code	**IND TEM5 08 0117**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to lead and manage continuous improvement systems and processes. Particular emphasis is on the development of systems and the analysis of information to monitor and adjust performance strategies, and to manage opportunities for further improvements.

Element	Performance Criteria
1. Lead continuous improvement systems and processes	1.1 ***Strategies*** are developed to ensure that team members are actively encouraged and supported to participate in decision-making processes, assume responsibility and exercise initiative as appropriate 1.2 ***Systems*** are established to ensure that the organisation's ***continuous improvement processes*** are communicated to the industries over all procedures 1.3 ***Stakeholders*** should be made available for innovative work activates 1.4 Ensure that change and improvement processes have met ***sustainability requirements*** 1.5 Effective mentoring and coaching processes are developed to ensure that individuals and teams are able to implement and support the organisation's continuous improvement processes 1.6 Ensure that insights and experiences from business activities are captured and made accessible through ***knowledge management systems***
2. Monitor and adjust performance strategies	2.1 Strategies are developed to ensure that systems and processes used to monitor ***operational progress*** and identify ways in which planning and operations could be improved 2.2 Strategies are adjusted and communicated according to organisational procedures
3. Manage opportunities for further improvement	3.1 Processes are established to ensure that team members are informed of outcomes of continuous improvement efforts 3.2 Processes are ensured to include ***recording of work team performance*** that assist in identifying further opportunities for improvement 3.3 Consider areas are identified for further improvement when undertaking future planning

Variable	Range
Strategies	May include but not limited: • clarification of roles and expectations • communication devices and processes, such as intranet and email communication systems, to facilitate input into workplace decisions • long-term or short-term plans that factor in opportunities for team input • mentoring and 'buddy' systems to support team members to participate in decision making • performance plans • reward and recognition programs for high performing staff • training and development activities.
Systems	May include but not limited: • forums and meetings • newsletters and reports • policies and procedures • electronic communication devices.
Continuous improvement processes	May include but not limited: • cyclical audits and reviews of workplace, team and individual performance • evaluations and monitoring of effectiveness • modifications and improvements to systems, processes, services and products • policies and procedures that allow an organisation to systematically review and improve the quality of its products, services and procedures • Seeking and considering feedback from a range of work procedures
Stakeholders	May include but not limited: • business or government contacts • funding bodies • individuals within the work team • internal and external contacts • organisation's clients and customers • professional associations • senior management and board members • unions and employee groups.
Sustainability requirements	May include but not limited: • addressing environmental and resource sustainability initiatives, such as environmental management systems, action plans, green office programs, surveys and audits • applying the waste management hierarchy in the workplace

	• complying with regulations and corporate social responsibility considerations for sustainability to enhance the organisation's standing in business and community environments • determining organisation's most appropriate waste treatment, including waste to landfill, recycling, re-use, recoverable resources and wastewater treatment • implementing environmental management systems, e.g. ISO 14001:1996 Environmental management systems life cycle analyses • implementing government initiatives • improving resource and energy efficiency • initiating and maintaining appropriate organisational procedures for operational energy consumption • introducing a green office program (a cultural change program) • introducing green purchasing • introducing national and international reporting initiatives, e.g. Global Reporting Initiative • introducing product stewardship • reducing emissions of greenhouse gases • reducing use of non-renewable resources • referencing standards, guidelines and approaches, such as sustainability covenants and compacts or triple bottom line reporting • Supporting sustainable supply chain.
Knowledge management systems	May include but not limited: • best practice transfer • communities of practice • cross-project learning • expert directories • knowledge brokers' knowledge mapping • knowledge repositories • measuring and reporting intellectual capital • mentoring • performance management • post-project reviews • proximity and architecture • social software • storytelling.
Operational progress	May include but not limited: • customer service indicators • OHS indicators • productivity gains • success in meeting agreed goals and performance indicators.

Recording of work team performance	May include but not limited: • annotated performance plans • quantitative data, such as production figures • recommendations for improvement • records and reports.

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • continuous improvement models • communication skills to communicate opportunities for improvement • planning skills to establish and monitor systems and process for continuous improvement • teamwork and leadership skills to gain the confidence and trust of others
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • knowledge management systems • quality systems • sustainability principles
Underpinning Skills	Demonstrate skills of: • learning skills to coach and mentor staff, using a range of methods to cater for different learning styles • innovation and lateral thinking skills to design better ways for achieving work outcomes
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 Management Level V	
Unit Title	**Assess Energy Loads and Manage Environmental Compliance in Electrical Workplace**
Unit Code	**IND TEM5 09 0117**
Unit Descriptor	This unit of competency covers the competence to plan and implement management system that ensures the protection of the environment in a workplace or business.

Element	Performance Criteria
1. Plan and manage compliance with environmental regulations	1.1 Reasons for ethical environmental practice in a workplace or business are identified 1.2 Environmental responsibilities of employers and employees follows ***work procedure*** an electrical workplace or business are identified 1.3 Penalties for enterprise and individual breaches of the legislation are identified 1.4 Waste ducts are minimised and facilities provided for waste ***tools and equipment*** to be stored in bins for recycling or disposal 1.5 Collection and recycling arrangements are implemented for liquids, sludge, solids and other waste 1.6 Suppliers with minimal excess packaging on goods received are sourced and packaging on goods received is sorted and disposed of appropriately 1.7 Waste and energy conservation strategies are identified and implemented
2. Manage potential hazards to stormwater system to avoid contamination	2.1 Systems are in place to ensure wastewater does not enter the stormwater system 2.2 All drains and flows are identified on a worksite map directly indicating where they flow 2.3 Trade waste permits are in place 2.4 Undercover and bunded or drained areas are provided and used for the storage of all materials containing environmentally hazardous substances 2.5 Spill kit is provided and used to prevent stormwater contamination 2.6 Workplace is kept clean to prevent unintentional stormwater pollution
3. Manage potential hazards to air quality to avoid contamination	3.1 Hazards of airborne particles are identified, minimised and contained 3.2 Hazards of gases and fumes are identified, minimised and contained

	3.3 A well-ventilated area is provided for any welding activities
4. Minimisation of noise hazards is planned and managed	4.1 Noise creating activities are minimised and carried out within approved operating hours 4.2 Fixed machinery is fitted with silencers or surrounded by noise containment material and ***personal protective equipment***
5. Management systems	5.1 An environmental policy and contingency plan suitable to the needs of the business is developed and implemented 5.2 Waste to landfill is calculated and possible savings through reuse and recycling are calculated 5.3 Payback period on environmental equipment is calculated 5.4 Manage staff adherence to environmental responsibilities 5.5 Environmental documents are maintained and stored securely in a form ***information/documents*** accessible for reporting procedures

Variable	Range
Work procedures	May include but not limited: • WHS legislation, Material Safety Data Sheets (MSDS), hazardous substances and dangerous goods code and local safe operating procedures • legislative obligations, environmental legislation, health regulations, and manual handling procedures and organisation insurance requirements
Tools and equipment	May include but not limited: • spill kits, recycling bins and drums
Personal protective equipment	is to include that prescribed under legislation, regulations and enterprise policies and practices
Information/documents	May include but not limited: • environmental legislation, regulations and advice • workplace procedures relating to the use of tools and equipment • work instructions and procedures • worksite environmental policy • workplace procedures relating to reporting and communication • manufacturer/component supplier specifications and operational procedures • local council and waterways regulations • MSDS, environmental documents, manufacturer/component supplier specifications,

	costing of equipment and waste removal • staff environmental induction material

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • aspects of environmental legislation and its relationship with Workplace Health and Safety (WHS), finance and risk management • communicate ideas and information to ensure all work undertaken is in accordance with environmental best practice, support from stakeholders is actively sought for implementing suitable innovation and continuous improvement
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • requirements for trade waste permits • spill clean-up procedures • characteristics and potential environmental impact of products used in the business • philosophy of sustainability through prevention, reuse, reduce and recycle • procedures for rectifying machinery faults and material defects • actions to be taken in case of environmental threat in the workplace • reporting procedures for environmental damage occurring in the workplace • cleaner production and eco-efficient strategies to avoid the production of waste
Underpinning Skills	Demonstrate skills to: • collect, organise and understand information related to environmental procedures from legislation, regulations, policies, guidelines, standards and workplace best practices in an automotive business • plan and organise activities including the preparation of equipment and materials recycling and waste management systems and the selection of worksite to avoid environmental contamination, back tracking, workflow interruptions or wastage • promote work with others and in a team by recognising dependencies and using cooperative approaches to minimise wastage, optimise workflow and productivity • use mathematical ideas and techniques to complete measurements and estimate material requirements required for the work and calculate wastage rates of various methods • use planning, checking and inspection techniques to avoid environmental contamination and wastage

	• use the workplace technology related to environmental protection and recycling equipment
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 Management Level V	
Unit Title	**Manage Project Quality**
Unit Code	**IND TEM5 10 0117**
Unit Descriptor	This unit specifies the outcomes required to manage quality within projects. It covers determining quality requirements, implementing quality assurance processes, and using review and evaluation to make quality improvements in current and future projects.

Elements	Performance Criteria
1. Determine quality requirements	1.1 ***Quality objectives***, standards and levels are determined, with input from stakeholders and guidance of a higher project authority, to establish the basis for quality outcomes and a ***quality management plan***. 1.2 Established ***quality management methods***, ***techniques and tools*** are selected and used to determine preferred mix of quality, capability, cost and time. 1.3 Quality criteria are identified, agreed with a higher project authority and communicated to stakeholders to ensure clarity of understanding and achievement of quality and overall project objectives. 1.4 Agreed quality requirements are included in the project plan and implemented as basis for performance measurement.
2. Implement quality assurance	2.1 Results of project activities and product performance are measured and documented throughout the project life cycle to determine compliance with agreed quality standards. 2.2 Causes of unsatisfactory results are identified, in consultation with the client, and appropriate actions are recommended to a higher project authority to enable continuous improvement in quality outcomes. 2.3 Inspections of quality processes and ***quality control*** results are conducted to determine compliance of quality standards to overall quality objectives. 2.4 A quality management system is maintained to enable effective recording and communication of quality issues and outcomes to a higher project authority and stakeholders.
3. Implement project quality improvements	3.1 Processes are reviewed and agreed changes implemented continually throughout the project life cycle to ensure continuous improvement to quality. 3.2 Project outcomes are reviewed against performance criteria to determine the effectiveness of quality

	management processes and procedures. 3.3 Lessons learned and recommended ***improvements*** are identified, documented and passed to a higher project authority for application in future projects.

Variable	**Range**
Quality objectives	May include but not limited to: • requirements from the client and other stakeholders • requirements from a higher project authority • negotiated trade-offs between cost, schedule and performance • those quality aspects which may impact on customer satisfaction
Quality management plan	May include but not limited to: • established processes • authorizations and responsibilities for quality control • quality assurance and continuous improvement
Quality management methods, techniques and tools	May include but not limited to: • brainstorming • benchmarking • charting processes • ranking candidates • defining control • undertaking benefit/cost analysis • processes that limit and/or indicate variation • control charts • flowcharts • histograms • pareto charts • scatter gram and run charts
Quality control	May include but not limited to: • monitoring conformance with specifications • recommending ways to eliminate causes of unsatisfactory • performance of products or processes • monitoring of regular inspections by internal or external agents
Improvements	May include but not limited to: • formal practices, such as total quality management or continuous improvement • improvement by less formal processes which enhance both the product quality and processes of the project, for example client surveys to determine client satisfaction with project team performance

Evidence Guide	
Critical Aspects of	Demonstrates skills and knowledge in:

Competence	• lists of quality objectives, standards, levels and measurement criteria • records of inspections, recommended rectification actions and quality outcomes • management of quality management system and quality management plans • application of quality control, quality assurance and continuous improvement processes • records of quality reviews • lists of lessons learned and recommended improvements • how quality requirements and outcomes were determined for projects • how quality tools were selected for use in projects • how team members were managed throughout projects with respect to quality within the project • how quality was managed throughout projects • how problems and issues with respect to quality and arising during projects were identified and addressed • how projects were reviewed with respect to quality management • how improvements to quality management of projects have been acted upon
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • the principles of project quality management and their application • acceptance of responsibilities for project quality management • use of quality management systems and standards • the place of quality management in the context of the project life cycle • appropriate project quality management methodologies; and their capabilities, limitations, applicability and contribution to project outcomes • attributes: ➢ analytical ➢ attention to detail ➢ able to maintain an overview ➢ communicative and positive leadership
Underpinning Skills	Demonstrate skills of: • ability to relate to people from a range of social, cultural and ethnic backgrounds, and physical and mental abilities • project and quality management • planning and organizing • communication and negotiation • problem-solving • leadership and personnel management

	• monitoring and review skills
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 Management Level V	
Unit Title	**Facilitate and Capitalize on Change and Innovation**
Unit Code	**IND TEM5 11 0117**
Unit Descriptor	This unit specifies the outcomes required to plan and manage the introduction and facilitation of change; particular emphasis is on the development of creative and flexible approaches, and on managing emerging opportunities and challenges.

Elements	Performance Criteria
1. Participate in planning the introduction and facilitation of change	1.1 Concept, nature importance and objective of change are understood. 1.2 Steps tools and approaches of changes are planned and made in consultation with ***appropriate stakeholders***. 1.3 The relationship among innovation, quality, change and cost is understood. 1.4 Environments that facilitate the expedition of change are understood. 1.5 ***Change resistance reducing techniques*** are identified and implemented.
2. Manage growth and transition of business	2.1 ***Needs for growth*** are identified. 2.2 ***Growth strategies*** are identified. 2.3 Selected growth strategies are implemented.
3 Develop creative and flexible approaches and solutions	3.1 Concepts, types and nature of problem are understood. 3.2 Variety of problem solving techniques and approaches are identified and analyzed to manage workplace issues. 3.3 ***Risks*** are identified and assessed, and action initiated to manage these to achieve a recognized benefit or advantage to the organization. 3.4 Workplace is managed in a way which promotes the development of innovative approaches and outcomes. 3.5 Creative and responsive approaches to resource management are used to improve productivity and services, and/or reduce costs.
4 Manage emerging challenges and opportunities	4.1 Future challenges and opportunities are identified in reference to global business situation 4.2 The role of technology and its value additions are explained. 4.3 Technology and innovation based system is introduced and implemented

	4.4 Individuals and teams are supported to respond effectively and efficiently to changes in the organization's goals, plans and priorities. 4.5 Coaching and mentoring are made to assist individuals and teams to develop competencies to handle change efficiently and effectively. 4.6 Opportunities are identified and taken as appropriate to make adjustments and respond to the changing needs of customers and the organization. 4.7 ***Information needs*** of individuals and teams are anticipated and facilitated as part of change implementation and management. 4.8 Recommendations are identified, evaluated and negotiated for improving the methods to manage change with appropriate individuals and groups.

Variables	**Range**
Appropriate stakeholders	May include but not limited to: • Organization directors and other relevant managers • Teams and individual employees who are both directly and indirectly involved in the proposed change • Union/employee representatives or groups • OHS committees • Other people with specialist responsibilities • External stakeholders where appropriate - such as clients, suppliers, industry associations, regulatory and licensing agencies
Change resistance reducing techniques	May include but not limited to: • Education and communication • Participation and involvement • Facilitation and support • Negotiation and agreement • Manipulation and cooptation • Explicit and implicit coercion
Needs for growth	May include but not limited to: • Survival • Economies of scale • Expansion of market • Owners mandate • Technology • Government policy and Self sufficiency
Growth Strategies	May include but not limited to: • Franchising • Outsourcing • Sub-contracting and Merging
Risks	May include financial and non-financial risks

Information needs	May include but not limited to: • New and emerging workplace issues • Implications for current work roles and practices including training and development • Changes relative to workplace legislation, such as OHS, workplace data such as productivity, inputs/outputs and future projections • Planning documents • Reports • Market trend data • Scenario plans and customer/competitor data

Evidence Guide	
Critical Aspects of Competence	Demonstrates skills and knowledge to: • Participate in planning the introduction and facilitation of change • Manage growth and transition of business • Develop creative and flexible approaches and solutions • Manage emerging challenges and opportunities
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • Relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination • Growth strategies • The principles and techniques involved in: ➢ Change and innovation management ➢ Development of strategies and procedures to implement and facilitate change and innovation • Use of risk management strategies: ➢ Identifying hazards, ➢ Assessing risks and implementing risk control measures ➢ Problem identification and resolution ➢ Leadership and mentoring techniques ➢ Management of quality customer service delivery ➢ Consultation and communication techniques ➢ Record keeping and management methods ➢ The sources of change and how they impact ➢ Factors which lead/cause resistance to change ➢ Approaches to managing workplace issues
Underpinning Skills	Demonstrate skills on: • Communication, Planning, Managing and team works
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 Management Level V	
Unit Title	**Manage Continuous Improvement Process (Kaizen)**
Unit Code	**IND TEM5 12 0117**
Unit Descriptor	This unit describes the performance, outcomes, knowledge, attitude and skills required to sustain and develop an environment in which continuous improvement, innovation and learning are promoted, rewarded and managed.

Elements	Performance Criteria
1. Diagnose the current status.	1.1 ***Parameters*** used for study current situation are obtained. 1.2 Internal and external environment is analyzed. 1.3 Problems related to targeted environment is recognized and identified. 1.4 Problems regarding to current situation are analyzed. 1.5 Alternatives are generated. 1.6 Best alternatives are selected.
2. Design an effective continuous improvement process (kaizen).	2.1 The values, mission and goals of kaizen management system are clarified. 2.2 The ***kaizen management template*** and a visual management logo full of purpose and meaning are developed. 2.3 A clear action strategy (master and detailed plans) is defined. 2.4 The most effective and proven ***kaizen tools*** are chosen and applied. 2.5 A practical way is identified to involve all employees in ***Gemba activities*** (top, middle and bottom).
3. Develop change capability.	3. 1. Kaizen Promotion Team Structure is developed. 3. 2. The Kaizen Training Plan is defined and started. 3. 3. Supervisors' kaizen capability and habits are developed. 3. 4. Key people are developed in terms of ***Individual leadership capability***.
4. Implement improved processes.	4.1 ***Sustainability/continuous improvement*** are promoted as an essential part of doing business. 4.2 Impacts of change and consequences are addressed for people, and transition plans implemented. 4.3 Objectives, time frames, measures and communication plans are ensured in place to manage implementation.

	4.4 Contingency plans are implemented in the event of non-performance. 4.5 Failure is followed-up by prompt investigation and analysis of causes. 4.6 Emerging challenges and opportunities are managed effectively. 4.7 Continuous improvement systems and processes are evaluated regularly. 4.8 Improvements are communicated to all relevant groups and individuals. 4.9 Opportunities are explored for further development of value stream improvement processes.
5. Establish direction and control.	5.1 A ***system audit tool*** is defined and implemented. 5.2 The kaizen management system is deployed across all company levels and functions. 5.3 Results are checked and corrections made. 5.4 ***Standard operating procedures*** are developed and maintained. 5.5 The recruit, training and evaluation systems are improved and ***HR practices*** compensated.

Variables	**Range**
Parameters	• May include but not limited to: • Working condition • Resources may include: ➢ Human ➢ Material and Machine • Kaizen elements
Kaizen management template	• May include but not limited to: • Visual management board for: ➢ displaying characteristic figures, data and graphics ➢ depicting and controlling processes ➢ identifying and marking sources of risks, setting and standards ➢ displaying company's values and goals of kaizen
Kaizen tools	• May include but not limited to: • 5S (a visual workplace management) • 7 QC tools(Cause and Effect Diagram, Check Sheet , Pareto Diagram , Histogram, Scatter Diagram, Control Chart and Flow Chart) • Brainstorming • Basic Industrial Engineering (IE) tools such as time study, motion study, line balancing, work sampling • JIT (JUST IN TIME) principles

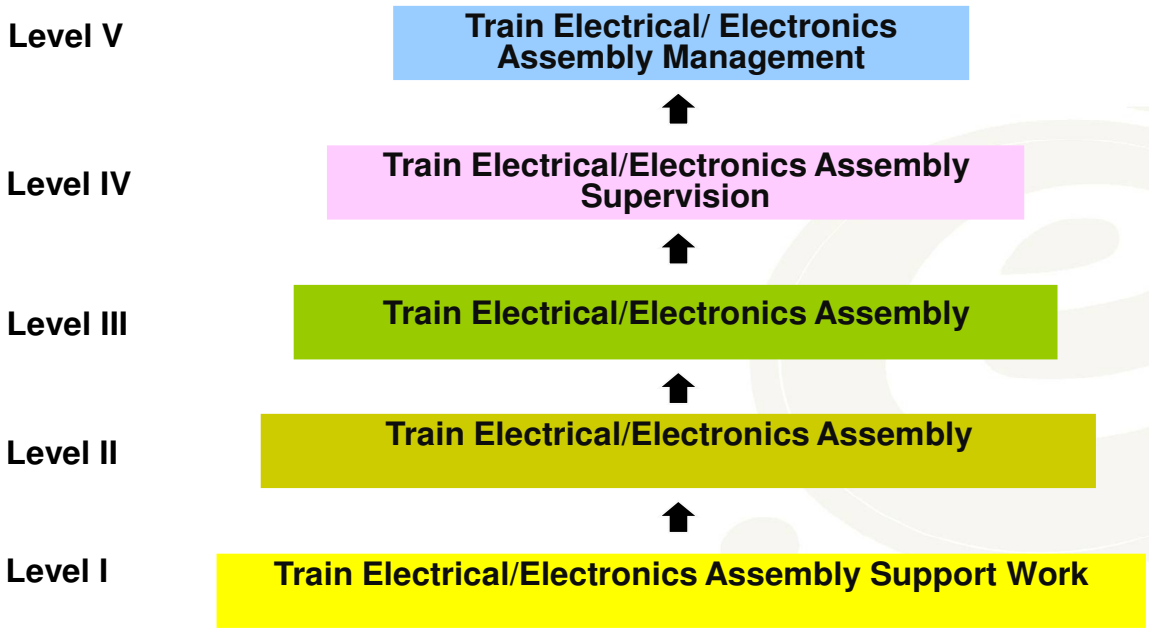
	• MUDA identification and elimination tools • Kanban • Poka-yoke and Takt- time
Gemba activities	• May include but not limited to: • Value-adding activities to satisfy the customer • Employee autonomous operations (participating in team to identify nonconformity, propose solutions and implement them autonomously)
Individual leadership capability	• May include but not limited to: • Personal and interpersonal skills • Courage • Honour and integrity • Energy and drive • Strategic skills • Operating and Organizational positioning skills
Sustainability/continuous improvement	• May include but not limited to: • Improvements made by following PDCA (Plan, Do, Check and Act) cycle for: ➢ Improvements in one's own work ➢ Saving in energy, material and other resources ➢ Improvements in the working environment ➢ Improvements in machines and processes ➢ Improvements in jigs and tools ➢ Improvement in office work ➢ Improvements in product quality ➢ Ideas for new products ➢ Customers services and customer relations
System audit tool	• May include but not limited to: • 5S audit • Patrol system • Kaizen board • 5M check lists and Key Performance Indicators (KPIs)
Standard operating procedure	• May include but not limited to: • Administrative standards for: ➢ Managing the business ➢ Administration ➢ Personnel Guidelines ➢ Job Descriptions ➢ Guidelines for preparing cost information • Operation standards for: ➢ Describing the way a job is done. ➢ Help realising Quality, cost, delivery. ➢ Addressing the need to satisfy customers. ➢ Using the process that's the best. ➢ Producing work in the most cost effective manner. ➢ Assuring total quality for the customer.
HR practices	• May include but not limited to: • Resources may include:

	➢ Recruit and retain high quality people with innovative skills and a good track, record in innovation • HR development is used for: ➢ strategic capability and provide encouragement and facilities for enhancing innovating skills and enhancing the intellectual capital of the organization • Reward will: ➢ Provide financial incentives and rewards and recognition for successful innovation

Evidence Guide	
Critical Aspects of Assessment	Demonstrates skills and knowledge competencies to: • Establish policy and cross-functional goals for kaizen • Deploy and implement goals as directed through policy deployment and cross-functional management. • Realize goals through deployment and audits. • Build systems, procedures, and structures conducive to kaizen. • Use kaizen in functional capabilities. • Introduce Kaizen as a corporate strategy • Provide support and direction between allocating resources • Establish, maintain and upgrade standards. • Make employees conscious through training programs. • Assist employees develop skills and tools for problem solving.
Underpinning Knowledge and Attitude	Demonstrates knowledge of: • Quality management and continuous improvement theories • creativity/innovation theories/concepts • competitive systems and practices tools, including: ➢ 5S ➢ JUST IN Time (JIT) ➢ mistake proofing ➢ process mapping ➢ establishing customer pull ➢ setting of KPIs/metrics ➢ SOP ➢ Kaizen elements/targets. ➢ identification and elimination of waste/MUDA ➢ continuous improvement processes including implementation, monitoring and evaluation strategies for a whole organization and its value stream ➢ Difference between breakthrough improvement and continuous improvement ➢ organizational goals, processes and structure ➢ approval processes within organization

	➢ methods of determining the impact of a change ➢ customer perception of value ➢ Define, Measure, Analyze, Improve and Control (DMAIC) to sustain process
Underpinning Skills	Demonstrates Skills to: • Use leadership skills to foster a commitment to quality and openness to improvement. • Analyze training needs and implementing training programs • Prepare and maintain quality and audit documentation • Undertake self-directed problem solving and decision-making on issues of a broad and/or highly specialized nature and in highly varied and/or highly specialized contexts • Communicate at all levels in the organization and to audiences of different levels of literacy and numeracy • Analyze current state/situation of the organization. • Analyze individually and collectively the implementation of competitive systems and practices tools in the organization and determining strategies for improved implementation • Solve highly varied and highly specialized problems related to competitive systems and practices implementation and continuous improvement to root cause • Negotiate with stakeholders, where required, to obtain information required for implementation and refinement of continuous improvements, including management, unions, employees and members of the community. • Review relevant metrics, including all those measures which might be used to determine the performance of the improvement system, including: ➢ Key Performance Indicators (KPIs) for existing processes ➢ Quality statistics ➢ Delivery timing and quantity statistics ➢ Process/equipment reliability (‘uptime’)
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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