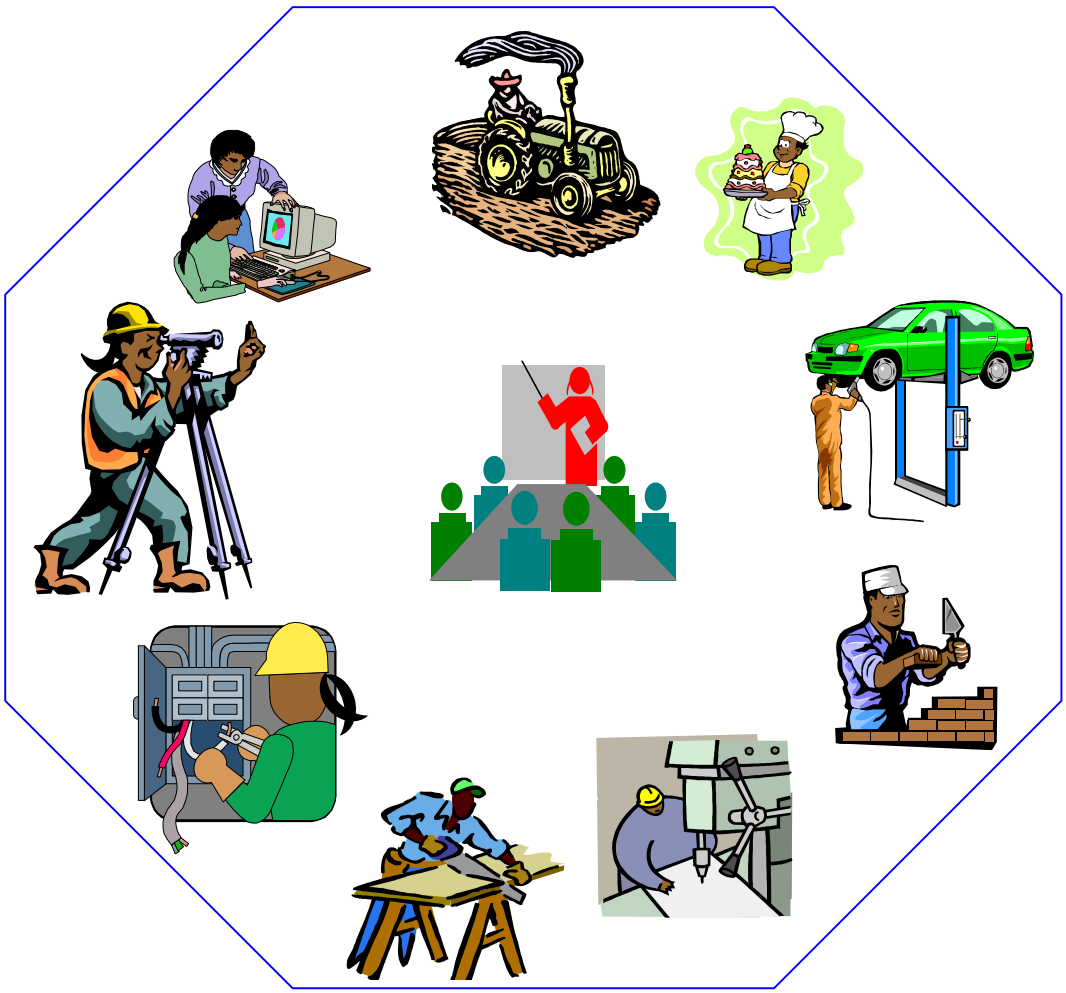
Federal Democratic Republic of Ethiopia

OCCUPATIONAL STANDARD

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

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

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

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

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

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

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

UNIT OF COMPETENCE CHART

Occupational Title: Biomedical Equipment Technology Management

Occupational Code: EEL BET

NTQF Level V

EEL BET5 01 0511 Write Specifications for Biomedical Equipment	EEL BET5 02 0511 Perform Commissioning of Biomedical Equipment and plant	EEL BET5 03 0511 Select Biomedical Equipment for Health System
EEL BET5 04 0511 Verify Compliance and Functionality of Biomedical Equipment Installations	EEL BET5 05 0511 Manage Installation and Maintenance Operation of Biomedical Equipment	EEL BET5 06 0511 Set-up Electronically Controlled Complex Systems in Biomedical Equipment
EEL BET5 07 0511 Participate in Biomedical Equipment System Work Policy Development	EEL BET5 08 0511 Manage Risk in Biomedical Equipment Technology Activities	EEL BET5 09 0511 Prepare Estimates, Quotes and Tenders
EEL BET5 10 0511 Implement and Monitor Healthcare Technology Management	EEL BET5 11 0511 Establish Quality Standards	EEL BET5 12 0511 Facilitate and Capitalize on Change and Innovation
EEL BET5 13 0511 Practice Career Professionalism	EEL BET5 14 0511 Establish and Conduct Business Relationships	EEL BET5 15 1012 Develop and Refine Systems for Continuous Improvement in Operations

TOP

Occupational Standard: Biomedical Equipment Technology Management Level V	
Unit of competence Title	**Write specifications for Biomedical Equipment**
Unit of competence Code	**ELE BETM 5 01 0511**
Unit Descriptor	This unit covers developing requirements to be incorporated into the writing of specifications for Biomedical Equipment. It encompasses determining the safety requirements to be met, establishing client expectations, ensuring cost effective solutions are pursued and documenting design and technical requirements. This unit shall demonstrate in relation to developing requirements to be incorporated into the writing of specifications for Biomedical Equipment technology with the following attributes: • safety requirements • client expectations established • cost effective solutions pursued and assured • design and technical requirements documentation Developing requirements to be incorporated into the writing of specifications for Biomedical Equipment shall be demonstrated in Biomedical Equipment technology disciplines.

Elements	Performance criteria
1 Prepare specification requirements	1.1 OHS processes and procedures for a given work area are identified, obtained and understood. 1.2 Established techniques for specification writing are reviewed are adopted in accordance with organization policies. 1.3 The scope of the specification is established using a formal evaluation/survey processes. 1.4 Criteria from other related works impacting on the specification are determined from other relevant documentation, site visits and/or discussion with appropriate person(s).
2 Write specification	2.1 Specification is developed to include scenarios/requirements established in consultation with appropriate person(s), and regulatory requirements. 2.2 Specification is developed in collaboration with all relevant professionals. 2.3 Competent persons required for the project are identified and their roles specified in the specification. 2.4 Specification is reviewed against all inputs and adjusted to rectify any anomalies.

	2.5 Specification is developed in accordance with organization policies and procedures.
3 Approval of specification is obtained	3.1 Specification is presented and discussed with person(s) of higher authority 3.2 Alterations to the specification resulting from the discussion are negotiated with person(s) of higher authority within the constraints of organization policy. 3.3 Specification is finalized and approval obtained from appropriate person(s).

Variables	**Description**
Occupational Health and safety(OHS)	Apply OH&S requirements in accordance with regulations/codes of practice and enterprise safety policies and procedures. This may include: • Using of relevant protective clothing and equipment, • use of tooling and equipment, workplace environment and safety handling of material, • Use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances. • Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc, • Following Occupational health and safety procedures designated for the task • Checking and fulfilling required safety devices before starting operation Apply safe operating procedures regarding: • electrical safety, • machinery movement and operation, • manual and mechanical lifting and shifting, • working in proximity to others and site visitors. Apply emergency procedures : • emergency shutdown and spring of equipment, • using extinguishing fires, first aid application and site evacuation
Tools and Equipment	Computer, printer, Fax and auxiliary equipments
Types and sources of information	Manual, catalogues, internet, equipment-performance and manufacturer's information background; procurement directives, regulatory information & standards, and senior expertise, reference books, enterprise quality management system procedures
Required knowledge	The extent of the essential knowledge and associated skills

	(EKAS) required is given. It forms an integral part of this unit. ▪ Enterprise quality management systems, basics ▪ Enterprise purchasing system ▪ Job costing techniques ▪ Specification development ▪ Risk management, application and techniques ▪ Critical path and project analysis ▪ Customer/client relations ▪ Computer use basics ▪ Research concepts ▪ Occupational Health and Safety, enterprise responsibilities

Evidence Guide	**Description**
Critical aspects of Assessment	A representative body of performance criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to: ▪ Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement ▪ Apply sustainable energy principles and practices as specified in the performance criteria and range statement ▪ Demonstrate an understanding of the essential knowledge and associated skills as described in this unit . It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements. ▪ Demonstrate an appropriate level of skills enabling employment ▪ 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: Write specifications for Biomedical Equipment technology as described in unit of scope and including: • Establishing the scope and parameters of the specification. • Determining the impact of other related works. • Developing the specification incorporating scenarios and all requirements. • Identifying competencies required for the specifications. • Writing specifications.

	• Negotiating alterations to the proposed specification successfully. • Obtaining approval of the final specification. • 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.
Resource Implications	The following resources MUST be provided: - Workplace or fully equipped assessment location with 1 necessary tools and equipment as well as consumable materials - Approved assessment tools - Certified assessor /Assessor's panel
Methods of assessment	Competency may be assessed through: • Practical assessment o Technical Interview/oral questioning o Practical demonstration o Simulation by off site practical test o Structured Observation of work • Theoretical exam • Supervisor report • Portfolio Assessment (Eg Certificate from training providers)
Context of assessment	• Competency may be assessed in the work place or in a simulated work place setting • The unit of competency should be assessed in conjunction with other relevant units in this occupation.

TOP

Occupational Standard: Biomedical Equipment Technology Management Level V	
Unit of Competence Title	**Perform commissioning of Biomedical Equipment and plant**
Unit Code	**ELE BETM 5 02 0511**
Unit Descriptor	This unit covers commissioning of Biomedical Equipment and plant. It encompasses working safely and with others, complying with requirements, applying knowledge of process and control components, pre-commissioning tests, following start up procedures, checking and adjusting components and controls to ensure efficient and safe operation and completing commissioning documentation

Elements	Performance criteria
1 Prepare to assist in commissioning Biomedical Equipment and plant	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 in preparation for the work. 1.3 Safety hazards that have not previously been identified are noted, and established risk control measures are implemented. 1.4 Commissioning plan is review with other team members to ensure commissioning procedures and the role of each member is understood and to ensure the work is coordinated effectively. 1.5 Measurement parameters are identified with the team by reviewing process requirements and equipment manufacturer instructions. 1.6 Tools, equipment and testing devices needed for the work are obtained in accordance with established procedures and checked for correct operation and safety 1.7 Preparatory work is checked to ensure no damage has occurred and that work complies with requirements 1.8 The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures 1.9 Circuits are checked as being isolated where necessary in strict accordance OHS requirements and procedures
2. Assist in commissioning Biomedical	2.1 OHS risk control measures and procedures for carrying out the work are followed. 2.2 Commissioning testing/measuring devices are connected

Equipment and plant	and set up in accordance with requirements for a particular Biomedical Equipment and plantand team instructions. 2.3 Process instruments and apparatus are set up and adjusted in accordance with process control requirements and equipment manufacturer instructions and team instructions. 2.4 Adjustments are made to provide optimum transmission/reception performance within regulatory requirements. 2.5 Decisions for dealing with unexpected situations are made from discussions with appropriate persons and from job specifications 2.6 Methods for dealing with unexpected situations are selected on the basis of safety and specified work outcomes. 2.7 Commissioning assistance is carried out efficiently without waste of materials or damage to apparatus, the surrounding environment or services and using sustainable energy principles.
3 Completion and report commissioning activities	3.1 OHS risk control work completion measures and procedures are followed. 3.2 Work site is cleaned and made safe in accordance with established procedures. 3.3 Adjustment settings are documented and appropriate person(s) notified in accordance with established procedures

Variables	**Statements**
Unit scope	This unit must be demonstrated in relation to process control systems incorporating closed loop control and digital and analogue elements and with at least five interacting control functions. Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated.
Occupational Health & Safety (OH&S)	Apply OH&S requirements in accordance with regulations/codes of practice and enterprise safety policies and procedures. This may include: - Using of relevant protective clothing and equipment, - use of tooling and equipment, - workplace environment and safety handling of material, - use of fire fighting equipment, enterprise first aid, - hazard control and hazardous materials and

	substances. - Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc, - Following Occupational health and safety procedures designated for the task - Checking and fulfilling required safety devices before starting operation Apply safe operating procedures regarding: - electrical safety, - machinery movement and operation, - manual and mechanical lifting and shifting, - working in proximity to others and site visitors. Apply emergency procedures : - emergency shutdown and sping of equipment, - using extinguishing fires, first aid application and site evacuation
Tools and Equipment	Electronics tool kit, mechanical toolkit, fixing and support devices, relevant measuring tools
Types and Sources of Information	Information source may include variable written and graphical instructions, work bulletins, data sheet, diagrams or sketches - Occupational health and safety manual - Industry/workplace codes of practice - Organization operating procedures, - Safety work procedures/manual and material safety data sheets - Workplace guidelines/ workshop manuals - Manufacturer's diagrams, charts - Manufacturer's catalogue/specification manual. - Manufacturer's service and operation manuals - Design specification manual - Repair request documentation ,job cards, - Manufacturing and designing specifications and instructions - Records and reports - Virtual library
Required knowledge	The extent of the essential knowledge and associated skills (EKAS) required is given in EKAS. It forms an integral part of this unit.

	• Process control, commissioning • Occupational Health and Safety principles • Instrumentation safe working practices
Evidence guide	Descriptions
Critical Aspects of Competence	A representative body of performance criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to: • Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement • Apply sustainable energy principles and practices as specified in the performance criteria and range statement • Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements. • Demonstrate an appropriate level of skills enabling employment • 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: Assist in commissioning process control systems as described in unit of scope and including: • Understanding the role of each commission team member • Connecting and setting-up commissioning testing/measuring devices in accordance with requirements for a particular Biomedical Equipment and plantand team instructions • Setting-up and adjusting process instruments and apparatus in accordance with process control requirements and equipment manufacturer instructions and team instructions. • Documenting adjustment settings in accordance with

	established procedures. • 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
Resource Implications	The following resources MUST be provided: - Workplace or fully equipped assessment location with necessary tools and equipment as well as consumable materials - Approved assessment tools - Certified assessor /Assessor's panel
Method of Assessment	Competency may be assessed through: • Practical assessment o Technical Interview/oral questioning o Practical demonstration o Simulation by off site practical test o Structured Observation of work • Theoretical exam • Supervisor report • Portfolio Assessment (Eg Certificate from training providers)
Context of Assessment	• Competency may be assessed in the work place or in a simulated work place setting • The unit of competency should be assessed in conjunction with other relevant units in this occupation.

EEL_BET5_03_0511

Occupational Standard: Biomedical Equipment Technology Management Level V	
Unit of Competence Title	**Select biomedical equipment for health system**
Unit Code	**ELE BETM5 03 0511**
Unit Descriptor	This unit covers selecting equipment for **biomedical equipment for health system** to meet performance standards. This encompasses the adoption of **biomedical equipment that** meet safety and service requirements, selection of control equipment and interconnecting cabling and tubing/piping based on calculated and deemed-to-comply arrangements. This unit must be demonstrated in relation to selecting equipment for **two biomedical equipment for health system** each with more than one input and more than one final output.

Elements	Performance criteria
1 Prepare to select equipment	1.1 The extent and nature of the Biomedical Equipment is determined from job specifications. 1.2 Safety and other regulatory requirements to which the Biomedical Equipment shall comply are identified, obtained and understood 1.3 Control apparatus and interconnecting components need for the control system and how they are arranged is determined from job specifications and knowledge of Selecting biomedical equipment for health system .
2. Select biomedical equipment for health system	2.1 Manufacturer's specifications and limitations of appropriate is sought and comparisons made with process parameters and service requirements. 2.2 Biomedical equipment for health system is selected on compatibility with standard parameters and service requirements and environmental conditions. 2.3 Evidence of specified apparatus IP rating is sought from manufacturer where necessary. 2.4 biomedical equipment for health system is selected based on percentage quality, efficiency and environmental considerations.
3 Select interconnecting cabling and tubing/piping	3.1 Types of cabling and their configuration are selected to meet environmental conditions and interconnection requirements.

	3.2 Tubing/piping and accessories are sized to meet capacity and pressure requirements 3.3 Route lengths of cable and tubing/piping are determined from site drawings.
4 Document process control system	4.1 Reasons for selections made, including calculations, are documented in accordance with established procedures. 4.2 Process Select biomedical equipment for health system arrangement and specifications for all selected items are documented in accordance with established procedures and forwarded to appropriate person(s).

Variables	**Statements**
Occupational Health & Safety (OH&S)	Apply OH&S requirements in accordance with regulations/codes of practice and enterprise safety policies and procedures. This may include: - Using of relevant protective clothing and equipment, - use of tooling and equipment, workplace environment and safety handling of material, - use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances. - Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc, - Following Occupational health and safety procedures designated for the task - Checking and fulfilling required safety devices before starting operation Apply safe operating procedures regarding: - electrical safety, - machinery movement and operation, - manual and mechanical lifting and shifting, - working in proximity to others and site visitors. Apply emergency procedures : - emergency shutdown and sping of equipment, - using extinguishing fires, - first aid application and site evacuation
Tools, equipment and material	Meter, mechanical toolkit
Types and Sources of Information	Information source may include variable written and graphical instructions, work bulletins, data sheet, diagrams or sketches - Occupational health and safety manual

	- Industry/workplace codes of practice - Organization operating procedures, - Safety work procedures/manual and material safety data sheets - Workplace guidelines/ workshop manuals - Manufacturer's diagrams, charts - Manufacturer's catalogue/specification manual. - Manufacturer's service and operation manuals - Design specification manual - Repair request documentation ,job cards, - Manufacturing and designing specifications and instructions - Records and reports - Virtual library
Required knowledge	• The extent of the essential knowledge and associated skills (EKAS) required is given in EKAS. It forms an integral part of this unit. • Technical manuals and catalogues • Technical standards, regulations and codes applicable to instrumentation and control • Measurement standards applicable to process instrumentation • Distributive Select biomedical equipment for health system principles • Instrumentation and control communications • Indicators and methods of recording process data • Process equipment installation requirements and techniques • Select biomedical equipment for health system arrangements and equipment selection • Occupational Health and Safety principles • Instrumentation safe working practices

Evidence guide	**Descriptions**
Critical Aspects of Competence	Assessment required the candidate • A representative body of performance criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a

	candidate is able to: • Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement • Apply sustainable energy principles and practices as specified in the performance criteria and range statement • Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements. • Demonstrate an appropriate level of skills enabling employment • 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: Select equipment for biomedical equipment for health system including: • Arranging control system to comply with safety and other regulatory requirements and process functions • Selecting compliant and compatible apparatus • Selecting appropriate control cabling and tubing/piping • Documenting control system arrangement, specification for items selected and reasons for the selections made • E 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
Resource Implications	The following resources MUST be provided: - Workplace or fully equipped assessment location with necessary tools and equipment as well as consumable materials - Approved assessment tools Certified assessor /Assessor's panel
Method of Assessment	Competency may be assessed through: • Practical assessment o Technical Interview/oral questioning o Practical demonstration

	o Simulation by off site practical test o Structured Observation of work • Theoretical exam • Supervisor report • Portfolio Assessment
Context of Assessment	• Competency may be assessed in the work place or in a simulated work place setting • The unit of competency should be assessed in conjunction with other relevant units in this occupation.

TOP

Occupational Standard: Biomedical Equipment Technology Management Level V	
Unit of Competence Title	**Verify compliance and functionality of biomedical Equipment installations**
Unit Code	**ELE BETM 5 04 0511**
Unit Descriptor	This unit covers pre-commissioning testing and visual inspection for verifying that biomedical Equipment installations in non-hazardous areas is safe and complies with requirements. It encompasses procedures for safely conducting safety tests, conducting visual inspections, identifying noncompliance defects and reporting requirements.
Elements	**Performance criteria**
1 Prepare to inspect and test a Verify compliance and functionality of biomedical Equipment installations	1.1 OHS measures for the site are identified, obtained and understood 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 noted, and established risk control measures are implemented. 1.4 Documentation or deemed to comply standard on which installation is based is reviewed and understood. 1.5 Appropriate personnel are consulted to ensure the work is coordinated effectively with others involved on the work site 1.6 Tools, equipment and testing devices needed to verify compliance are obtained in accordance with established procedures and checked for correct operation and safety 1.7 Preparatory work is checked to ensure no damage has occurred and that work complies with requirements
2 Visually inspect the installation	2.1 OHS risk control measures and procedures for carrying out the work 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/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures. 2.4 Instrument cabling and tubing is checked for suitability for the environments in which they are installed and suitably protected from damage. 2.5 The type and configuration/sizing of instrument cabling and tubing is confirmed as meeting that specified for the installation.

	2.6 Evidence that control apparatus complies with safety and installation requirements is cited. 2.7 Marking of biomedical Equipment is checked for accuracy and clarity and compliance with requirements.
3 Conduct functional and Safety testing.	3.1 OHS risk control measures and procedures for carrying out the work are followed. 3.2 The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures 3.3 Circuits/machines/plants of biomedical Equipment are checked as being isolated where necessary in strict accordance OHS requirements and procedures. 3.4 Where biomedical Equipment are made for an authorized person to conduct and report on all required electrical safety tests. 3.6 biomedical Equipment installations are tested in accordance with established practice. 3.7 Functional and test are checks are conducted on all biomedical Equipment installations in accordance with established practice.
4 Report inspection and test findings	4.1 OHS risk control work completion measures and procedures are followed. 4.2 Work site is cleaned and made safe in accordance with established procedures. 4.3 Non-compliance defects are identified and reported in accordance with established procedures. 4.4 Recommendations for rectifying defects are made in accordance with established procedures. 4.5 Verification documentation is completed in accordance with established procedures

Variables	**Statements**
Unit scope	This unit must be demonstrated in relation to verifying compliance and functionality of at least one electrical/electronic and one pneumatic biomedical Equipment installations comprising a measuring transmitter, controller, final control element, indicator and cabling/tubing. Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated.
Occupational Health & Safety (OH&S)	Apply OH&S requirements in accordance with regulations/codes of practice and enterprise safety policies and procedures. This may include: - Using of relevant protective clothing and equipment, - use of tooling and equipment,

	- workplace environment and safety handling of material, - use of fire fighting equipment, enterprise first aid, - hazard control and hazardous materials and substances. - Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc, - Following Occupational health and safety procedures designated for the task - Checking and fulfilling required safety devices before starting operation Apply safe operating procedures regarding: - electrical safety, - machinery movement and operation, - manual and mechanical lifting and shifting, - working in proximity to others and site visitors. Apply emergency procedures : - emergency shutdown and sping of equipment, - using extinguishing fires, - first aid application and site evacuation
Tools, Equipment and materials	Electronics tool kit, mechanical toolkit, portable power tool like drilling machine, fixing and support devices, electrical workshop machines
Types and Sources of Information	Information source may include variable written and graphical instructions, work bulletins, data sheet, diagrams or sketches • Occupational health and safety manual • Industry/workplace codes of practice • Organization operating procedures, • Safety work procedures/manual and material safety data sheets • Workplace guidelines/ workshop manuals • Manufacturer's diagrams, charts • Manufacturer's catalogue/specification manual. • Manufacturer's service and operation manuals • Design specification manual • Repair request documentation ,job cards, • Manufacturing and designing specifications and instructions • Records and reports • Virtual library

Required Knowledge	The extent of the essential knowledge and associated skills (EKAS) required is given in EKAS. It forms an integral part of this unit. • biomedical Equipment installations • Control system installation, testing and verification methods • Occupational Health and Safety principles • Instrumentation safe working practices

Evidence guide	**Descriptions**
Critical Aspects of Competence	A representative body of performance criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to: ▪ Implement Occupational Health and Safety work place procedures and practices, including the use of risk control ▪ measures as specified in the performance criteria and range statement ▪ Apply sustainable energy principles and practices as specified in the performance criteria and range statement ▪ Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements. ▪ Demonstrate an appropriate level of skills enabling employment ▪ 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: o Verify compliance and functionality of biomedical Equipment installations o as listed as described in unit scope and including: • Selecting correct tools and testing equipment. • Identifying visual non-compliance defects • Using effective methods for conducting tests • Identifying non-compliance from test results. • Identifying causes of non-compliance and recommending how these should be rectified. • Completing verification documentation

	• 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
Resource Implications	The following resources MUST be provided: • Workplace or fully equipped assessment location with necessary tools and equipment as well as consumable materials • Approved assessment tools • Certified assessor /Assessor's panel
Method of Assessment	Competency may be assessed through: • Practical assessment o Technical Interview/oral questioning o Practical demonstration o Simulation by off site practical test o Structured Observation of work • Theoretical exam • Supervisor report • Portfolio Assessment (Eg Certificate from training providers)
Context of Assessment	• Competency may be assessed in the work place or in a simulated work place setting • The unit of competency should be assessed in conjunction with other relevant units in this occupation.

TOP

Occupational Standard: Biomedical Equipment Technology Management Level V	
Unit Title	**Manage Installation and Maintenance Operation Of Biomedical Equipment**
Unit Code	**ELE BETM 5 05 0511**
Unit Descriptor	This unit covers the knowledge, attitudes and skills required to develop and monitor the implementation of the operational plan and to provide efficient and effective workplace practices within the organization's Services delivery quality and Efficiency plans.

Elements	Performance Criteria
1. Develop operational plan	1.1 Resource requirements are researched, analyzed and documented and an operational plan is developed and/or implemented in consultation with **relevant personnel, colleagues and specialist resource managers** 1.2 **Consultation processes** are developed and/or implemented as an integral part of the operational planning process 1.3 **Operational plans** are developed to contribute to the achievement of the organization's performance/business plan 1.4 Details of the operational plan include the development of **key performance** indicators to measure organizational performance 1.5 **Contingency plans** are developed and implemented at appropriate stages of operational planning 1.6 The development and presentation of proposals for resource requirements are assisted by a variety of information sources, and specialist advice is sought as required
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 achievable components in accordance with set time frames 2.3 ***Resources*** are allocated as per requirements of the activity 2.4 ***Schedule of work activities*** is coordinated with personnel concerned
3. Plan and manage resource acquisition	3.1 Strategies are developed and implemented to ensure that employees are recruited and/or inducted within the organization's human resource management policies and practices 3.2 Strategies are developed and implemented to ensure that

	physical resources and services are acquired in accordance with the ***organization's policies, practices and procedures***
4. Monitor and review operations	4.1 Performance systems and processes are developed, monitored and reviewed to assess progress in achieving profit and productivity plans and targets 4.2 Budget and actual financial information is analyzed and interpreted to monitor and review profit and productivity performance 4.3 Areas of underperformance are identified, solutions recommended, and prompt action is taken to rectify the situation 4.4 Implementation of developed systems are monitored to ensure that mentoring and coaching are provided to support individuals and teams to use resources effectively, economically and safely 4.5 Recommendations for variations to operational plans are negotiated and approved by designated persons/groups 4.6 Systems are developed and implemented to ensure that procedures and records associated with documenting performance are managed in accordance with the organization's requirements
5. Review and evaluate work performance	5.1. Work plans, strategies and implementation are reviewed based on accurate, relevant and current information 5.2. Review is 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
Relevant personnel, colleagues and specialist resource managers	• managers • supervisors • other employees • OHS committee(s) and other people with specialist responsibilities • union or employee representatives • people at the same level or more senior managers • people from a wide range of social, cultural and ethnic Backgrounds
Consultation processes	• meetings, interviews, brainstorming sessions, email/internet communications, newsletters or other processes and devices which ensure that all employees have the opportunity to contribute to team and individual operational plans • mechanisms used to provide feedback to the work team in relation to outcomes of consultation
Operational plans	• tactical plans developed by the department or section to detail product and service performance • organizational plans
Key performance indicators	• measures for monitoring or evaluating the efficiency or effectiveness of a system which may be used to demonstrate accountability and to identify areas for improvements
Contingency plans	• rental, hire purchase or alternative means of procurement of required materials, equipment and stock • contracting out or outsourcing human resource and other functions or tasks • strategies for reducing costs, wastage, stock or consumables • diversification of outcomes • recycling and re-use • finding cheaper or lower quality raw materials and consumables • seeking further funding • increasing sales or production • risk identification, assessment and management processes • succession planning
Organization's policies, practices and procedures	• those organizational guidelines which govern and prescribe operational functions, such as the acquisition and management of human and physical resources • standard operating procedures • undocumented practices in line with organizational operations • organizational culture
Designated persons/groups	• managers or supervisors whose roles and responsibilities

	include decision making on operations • other work groups or teams whose work will be affected by recommendations for variations • groups designated in workplace policies and procedures • other stakeholders such as Board members
Feedback mechanisms	• Feedback mechanisms include: o verbal feedback o informal feedback o formal feedback o questionnaire o survey o group discussion

Evidence Guide	
Critical Aspects of Competence	Demonstrates skills and knowledge in: • developing operational plan • planning and managing resource acquisition monitoring and reviewing operational performance
Underpinning Knowledge and Attitudes	Demonstrates 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 • the principles and techniques involved in the management and organization of: ▪ planning and managing operations ▪ consultation and communication ▪ contingency planning ▪ resource planning and acquisition ▪ resource management systems ▪ budgeting and financial analysis and interpretation ▪ monitoring and review of performance systems and processes ▪ reporting performance ▪ problem identification and resolution ▪ alternative approaches to improving resource usage and eliminating resource inefficiencies and waste ▪ ways of supporting individuals/teams who have difficulty in performing to the required standard
Underpinning Skills	Demonstrates skills to: • relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities • functional literacy skills to access and use workplace information • monitor and review a safe workplace and environment • access and use feedback to improve operational performance

	• prepare recommendations to improve operational plans • access and use established systems and processes • coach and mentor skills to provide support to colleagues
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	Competency may be assessed through: • Interview/Written Test • Observation/Demonstration (Simulation)
Context of Assessment	Competency may be assessed in the work place or in a simulated work place setting

TOP

Occupational Standard: Biomedical Equipment Technology Management Level V	
Unit of Competency Title	**Set up electronically controlled complex systems in biomedical equipment**
Unit Code	**ELE BETM 5 06 0511**
Unit Descriptor	This unit covers the setting up, adjustment, maintenance and modification to electronically controlled mechanically operated complex systems in biomedical equipment, fluid control systems that integrate with the operation of on machinery and electronically controlled complex systems that are integrated with hydraulic devices. It encompasses working safely, applying extensive knowledge of electronic circuits and the integration to biomedical equipment and systems, electronic and fluid control circuit operations and complex circuits designed to operate fluid systems and the integration to hydraulics, gathering and analyzing data, applying problem solving techniques, developing and documenting solutions and alternatives.

Elements	Performance criteria
1 Prepare to set up Electronically controlled mechanically operated complex systems in biomedical equipment.	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 work to be undertaken is determined from performance specifications and situation reports and in consultations 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 formed to ensure solution development and implementation is carried out efficiently
2 Set up electronically Controlled mechanically operated complex systems in biomedical equipment.	2.1 OHS risk control measures and procedures for carrying out the work are followed 2.2 Knowledge of complex controls and integrated mechanical systems are applied to developing analytical solutions to machine parameters and operation 2.3 Parameters, specifications and performance requirements in relation to each circuit and mechanical device are obtained in accordance with established procedures 2.4 Approaches to setting up, maintenance and/or modification are carried out to provide the most effective solution 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

	organizational or professional standards
3 Document and report on the results of the set up and actions taken.	3.1 Solutions to set up, maintenance activity and/or modification are tested to determine their effectiveness and modified where necessary 3.2 Set up, maintenance activity and/or modification is documented including details of all findings, calculations and assumptions 3.3 Set up, maintenance activity and/or modification is reported to appropriate personnel to establish suitable action to be taken based on findings 3.4 Justification for findings and any actions to be undertaken in relation to the work activity is documented for inclusion in work/project or development records in accordance with professional standards

Variables	**Statements**
Unit scope	. This unit must be demonstrated in relation to setting up electronically controlled mechanically operated complex biomedical systems on at least 2 types of machines. Typical systems are those encountered in meeting performance requirements and compliance standards, revising a machine operating parameters and dealing with machine malfunctions. Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated.
Occupational Health & Safety (OH&S)	Apply OH&S requirements in accordance with regulations/codes of practice and enterprise safety policies and procedures. This may include: - Using of relevant protective clothing and equipment, - use of tooling and equipment, - workplace environment and safety handling of material, - use of fire fighting equipment, enterprise first aid, - hazard control and hazardous materials and substances. - Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc, - Following Occupational health and safety procedures designated for the task - Checking and fulfilling required safety devices before starting operation Apply safe operating procedures regarding:

	- electrical safety, - machinery movement and operation, - manual and mechanical lifting and shifting, - working in proximity to others and site visitors. Apply emergency procedures : - emergency shutdown and sping of equipment, - using extinguishing fires, first aid application and site evacuation
Tools and Equipment	Electronics tool kit, mechanical toolkit, portable power tool like drilling machine, relevant measuring tool, fixing and support devices, electrical workshop machines
Types and Sources of Information	Manual, catalogues, internet, equipment-performance and manufacturer's information background; procurement directives, regulatory information & standards, and senior expertise, reference books, enterprise quality management system procedures
Required knowledge	The extent of the essential knowledge and associated skills (EKAS) forms an integral part of this unit. • Occupational health and safety principles • Electronic interfacing to mechanical systems

Evidence guide	**Descriptions**
Critical Aspects of Competence	A representative body of performance criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to: ▪ Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range ▪ statement ▪ Apply sustainable energy principles and practices as specified in the performance criteria and range statement ▪ Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements. ▪ Demonstrate an appropriate level of skills enabling employment ▪ 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: Set up electronically controlled mechanically operated complex systems as described in 8) and including: • Understanding the operation of electronic and mechanical controls • Forming effective strategies for analyzing circuit and mechanical performance • Obtaining circuit control and mechanical parameters, specifications and performance requirements appropriate to each situation. • Testing the results of the analysis • Documenting instruction for implementing any actions resulting from the analysis that incorporates risk control measure to be followed. • Documenting justification of actions to be 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
Resource Implications	The following resources MUST be provided: - Workplace or fully equipped assessment location with 1 necessary tools and equipment as well as consumable materials - Approved assessment tools Certified assessor /Assessor's panel
Method of Assessment	Competency may be assessed through: • Practical assessment o Technical Interview/oral questioning o Practical demonstration o Simulation by off site practical test o Structured Observation of work • Theoretical exam • Supervisor report • Portfolio Assessment (Eg Certificate from training providers)
Context of Assessment	• Competency may be assessed in the work place or in a simulated work place setting • The unit of competency should be assessed in conjunction with other relevant units in this occupation.

TOP

Occupational Standard: Biomedical Equipment Technology Management Level V	
Unit of competence Title	**Participate in Biomedical Equipment management system work policy and competency development activities**
Unit of competence Code	**ELE BETM 5 07 0511**
Unit Descriptor	This unit covers the application biomedical equipment management policies in actively participating in work activities and in one's own competency development. It complies with established industry/enterprise procedures regarding how work is conducted, understanding responsibilities and obligations under competency development plan, following activities for developing competency, self-monitoring competency development and meeting trainee obligations for periodic reporting of competency development activities.

Elements	Performance criteria
1 Comply with biomedical equipment management work policies and procedures	1.1 biomedical equipment management policies and procedures for all work activities are identified and obtained. 1.2 Clarification on how particular work is to be carried out and the procedures involved is sought from the immediate supervisor/appropriate person. 1.3 Unexpected situations are dealt with safely and in accordance with industry/enterprise policies and procedures, and with the approval of an authorized person
2 Monitor and respond to a personal competency development plan.	2.1 All aspects of the competency development plan are confirmed in consultation with appropriate persons. 2.2 All components of the competency development plan are followed diligently. 2.3 Opportunities to practice skills and apply knowledge relative to a particular competency are pursued. 2.4 Assistance is sought from appropriate persons to overcome difficulties in developing skills and applying knowledge relevant to a particular competency. 2.5 Progress in competency development is self monitored against the competency development plan and industry/enterprise policies and procedures. 2.6 Modifications to the personal competency development plan are made in consultation with appropriate persons. 2.7 Obligations are met for periodic and timely reporting of competency development activities. 2.8 Periodic competency development activities report is validated by an appropriate person in accordance with industry/enterprise policies and procedures.

Range Variables	Description
Unit Scope	This unit must be demonstrated following the completion of a range of performance process activities that contribute to assisting in the evaluation of progress towards the development of competency. The unit applies to those engaged in employment-based programs covered by an approved contract of training under a relevant State/Territory training Act seeking to complete the qualification. Incorporated therein is the requirement for deploying an approved competency development (training) plan. The Plan specifies the units which are to be attained to complete the qualification. This unit is a core requirement for the completion of the qualification. It encompasses the processes required to participate in the development of competence by an apprentice/learner in the industry and in particular the activities associated with performance in the workplace and in vocational and technical education. It includes but is not limited to recognizing and participating in: 1. The competency development plan: • Context of the plan • State/Territory regulatory requirements(Acts/Regulations) • Competency development (training) contracts • Competency development (nominal training) period • Purpose of competency development (training) plans • Process in developing competency development (training) plans • Parties involved in the competency development (training) plan • Responsibilities of Parties: - RTO responsibilities - Role of State Training Authority (STA) - Employer responsibilities - Employee/Learner responsibilities • Context of responsible parties: - Industry customs, work practices - Industry bodies - employer and employee representatives - Regulatory bodies, including licensing/registration, OHS, IR, training authorities - apprentice/trainee regulation - Vocational and technical education system - AQF, credentials, AQTF - RTO training practices, requirements, administration, costs, and support services 2. Workplace practice and exposure:

	• Timely reporting of workplace exposures and practice • Supervisor confirmation of workplace exposures and practices in a structured workplace report 3. Workplace evidence reporting: • Unit of work • Elements and performance of work • Range of items exposed to and practiced on • Level of supervision received • Period of exposure 4. Workplace evidence validation: • Currency of evidence • Authenticity of evidence • Sufficiency of evidence 5. Workplace evidence reporting review: • Contribution towards progressive development for the qualification • Competency standard unit progressive reporting • Regular review of progress report • Timing of periodic monitoring/evaluation • Procedures for monitoring and analyzing progress • Procedures for responding to anomalies in competency development • Procedures for liaison with the workplace supervisor 6. Periodic evaluation of competency development (training) progress: • Stages of progress that are to be met in developing competent performance • Evaluation of progress against requisite stages of development towards competent performance • Implementation of remedial measures • Periodic progress report formally confirmed to parties Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.
Occupational Health and safety(OHS)	Apply OH&S requirements in accordance with regulations/codes of practice and enterprise safety policies and procedures. This may include: - Using of relevant protective clothing and equipment, - use of tooling and equipment, workplace environment and safety handling of material, - use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances. - Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones ,

	gloves etc, - Following Occupational health and safety procedures designated for the task - Checking and fulfilling required safety devices before starting operation Apply safe operating procedures regarding: - electrical safety, - machinery movement and operation, - manual and mechanical lifting and shifting, - working in proximity to others and site visitors. Apply emergency procedures : - emergency shutdown and sping of equipment, - using extinguishing fires, first aid application and site evacuation
Tools and Equipment	Computers,lap, printer, and auxiliary equipments, paper
Types and sources of information	Manual, catalogues, internet, equipment-performance and manufacturer's information background; procurement directives, regulatory information & standards, and senior expertise, reference books, enterprise quality management system procedures
Required knowledge	The extent of the essential knowledge and associated skills (EKAS) required is given. A. Responsibilities under a competency development plan B. Methods of monitoring and reporting competency development activities C. Enterprise work activities policies and procedures

Evidence Guide	**Description**
Critical aspects of Assessment	A representative body of performance criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to: ▪ Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement ▪ Apply sustainable energy principles and practices as specified in the performance criteria and range statement ▪ Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements. ▪ Demonstrate an appropriate level of skills enabling employment

	▪ 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: Participate in instrumentation and control work and competency development activities as detailed in unit of competence including: A. Identifying and confirming the context, requirements and responsibilities of the competency development (training) plan to be met B. Identifying and confirming the critical industry, enterprise and regulatory policies, procedures and context applicable to all work activities C. Identifying and confirming the applicable training practices, requirements, administration, costs and support service policies and procedures provided by the RTO to all vocational and technical education activities D. Dealing with unexpected situations in accordance with industry/enterprise policies and procedures, and with the approval of an authorised person E. Reporting periodically the competency development activities in accordance with requirements F. Periodically reviewing progress of the competency development activities in accordance with requirements G. Pursuing strategies to develop opportunities for gaining the range of workplace experiences and exposure H. Progressing successfully against periodic or staged evaluative performance events according to requirements I. Seeking assistance to overcome difficulties in developing competency J. 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
Resource Implications	The following resources MUST be provided: - Workplace or fully equipped assessment location with 1 necessary tools and equipment as well as consumable materials - Approved assessment tools - Certified assessor /Assessor's panel
Methods of assessment	Competency may be assessed through: • Practical assessment o Technical Interview/oral questioning o Practical demonstration

	o Simulation by off site practical test o Structured Observation of work • Theoretical exam • Supervisor report • Portfolio Assessment (Eg Certificate from training providers)
Context of assessment	• Competency may be assessed in the work place or in a simulated work place setting • The unit of competency should be assessed in conjunction with other relevant units in this occupation.

TOP

Occupational Standard: Biomedical Equipment Technology Management Level V	
Unit Title	**Manage risk in Biomedical Equipment technology activities**
Unit Code	**ELE BETM 5 08 0511**
Unit Descriptor	This unit covers managing risk related to OHS, environment, resources and financial viability. It encompasses identifying risk events, the likelihood and consequences of such events, evaluating risk, risk management planning and mitigation of risk.

Elements	Performance criteria
1 .Identify risks and develop management strategies	1.1 OHS policies, processes and procedures for a given work area are identified, obtained and understood. 1.2 The extent of a program or project is established from design brief, specification and/or other relevant documentation and from discussions with appropriate person(s). 1.3 Potential, perceived and actual risk events are identified, documented and analyzed, in consultation with risk professionals and appropriate other person(s) in accordance with organization policies and procedures. 1.4 Risk management methods, tools and techniques are used to assist in the analysis and reporting of identified risk events. 1.5 Risk management techniques are used to analyze risk events, assess options and recommend risk approaches to appropriate person(s) for approval. 1.6 Risk management processes and procedures are developed and agreed to by all stakeholders and communicated to ensure clarity of understanding and ongoing management of risk factors. 1.7 OHS risk control measure are incorporated in the in the in the risk management strategies in compliance with organisation's OHS policy and regulations.
2 Implement and monitor risk management strategies	2.1 Risk management processes and procedures are incorporated into work and project plans to ensure common approach achieving outcomes. 2.2 Activities are monitored against programs and projects plans to identify and respond to variations in accordance with risk management processes and procedures. 2.3 Agreed risk responses are implemented and plans modified to reflect changing project objectives in an environment of uncertainty.
3 Evaluate risk	3.1 Project outcomes are reviewed wit appropriate person(s) to

management strategies.	determine effectiveness of risk management processes and procedures. 3.2 Risk issues and recommended improvements are identified, documented and passed to appropriate person(s) for approval to incorporate them into ongoing programs and future program and project and plans.

Range Variables	**Description**
Unit Scope	This unit shall be demonstrated in managing risk in relation to a program or an individual project. Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated.
Occupational Health and safety(OHS)	Apply OH&S requirements in accordance with regulations/codes of practice and enterprise safety policies and procedures. This may include: - Using of relevant protective clothing and equipment, - use of tooling and equipment, workplace environment and safety handling of material, - use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances. - Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc, - Following Occupational health and safety procedures designated for the task - Checking and fulfilling required safety devices before starting operation Apply safe operating procedures regarding: - electrical safety, - machinery movement and operation, - manual and mechanical lifting and shifting, - working in proximity to others and site visitors. Apply emergency procedures : - emergency shutdown and sping of equipment, - using extinguishing fires, first aid application and site evacuation
Tools and Equipment	Computer, printer and auxiliary equipments
Types and sources of information	Manual, catalogues, internet, equipment-performance and manufacturer's information background; procurement directives, regulatory information & standards, and senior expertise, reference books, enterprise quality management system procedures

Required knowledge	The extent of the essential knowledge and associated skills (EKAS) required is given. It forms an integral part of this unit. A. Risk management, application and techniques B. Occupational Health and Safety, organizational responsibilities

Evidence Guide	**Description**
Critical aspects of Assessment	A representative body of performance criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to: ▪ Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement ▪ Apply sustainable energy principles and practices as specified in the performance criteria and range statement ▪ Demonstrate an understanding of the essential knowledge and associated skills as described in this unit . It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements. ▪ Demonstrate an appropriate level of skills enabling employment ▪ 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: Manage risk in electro technology activities as described in unit of scope and including: A. Identifying potential, perceived and actual risk events. B. Using risk management methods, tools and techniques in analysis and reporting. C. Incorporating risk management processes and procedures into program and project plans. D. Monitoring and responding risk events effectively. E. Identifying improvements and documenting recommendation for their inclusion in ongoing or future programs and projects. F. 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.

Resource Implications	The following resources MUST be provided: - Workplace or fully equipped assessment location with necessary tools and equipment as well as consumable materials - Approved assessment tools - Certified assessor /Assessor's panel
Methods of assessment	Competency may be assessed through: • Practical assessment o Technical Interview/oral questioning o Practical demonstration o Simulation by off site practical test o Structured Observation of work • Theoretical exam • Supervisor report • Portfolio Assessment (Eg Certificate from training providers)
Context of assessment	• Competency may be assessed in the work place or in a simulated work place setting • The unit of competency should be assessed in conjunction with other relevant units in this occupation.

TOP

Occupational Standard: Biomedical Equipment Technology Management Level V	
Unit of competence	**Prepare estimates, quotes and tenders**
Unit Code	**ELE BETM 5 09 0511**
Unit Descriptor	This competency standard covers the process of preparing Bid document, Evaluation and tenders in a Biomedical Equipment Technology management. Bid Documents and Evaluation may be developed as stand alone estimates or quotes for a specific purpose, or they may be incorporated in tenders. Work is likely to be under limited supervision with checking related to overall progress by senior managers. Responsibility for the work of others and team coordination may be required. Estimating, quoting and tendering are usually performed within policy guidelines and procedures where discretion and judgment are required in the selection of technology, work organization, and the achievement of outcomes within time and budgetary constraints.

Elements	Performance Criteria
1 Carry out preliminary planning activities for estimating, quoting and/or tendering	1.1 Nature and scope of the **project/activities** are identified in consultation with the **client** according to organization policy. 1.2 Format, specifications and deadline for submission of the estimate, quote or tender are identified and confirmed with the organization. 1.3 Available **relevant documentation** is obtained and interpreted. 1.4 **Project site/activities** is inspected and reconciled with scaled drawings, project and other site plans in consultation with the client, agent or other authority.
2 Determine resource requirements	2.1 Detailed project/activity information and monetary sums are interpreted and recorded from client specifications. 2.2 Size, type and quantity of required project/activity **resources** are identified and estimated according to organization specifications. 2.3 **Sources** are identified and evaluated for the procurement of suitable equipment resources consistent with the organization requirements. 2.4 Appropriate **tools and equipment** are selected and used to calculate the correct size, type and quantity of each resource item. 2.5 Unit and total cost for each resource item are calculated and documented. 2.6 Necessary and appropriate contingency sums to complete the estimate, quote or tender are interpreted and documented. 2.7 Calculations are accurately recorded on a price summary sheet.
3 Prepare schedules for the estimate, quote or	3.1 **Works schedule** is documented according to client specifications.

tender	3.2 Scheduling of resources is accurately documented consistent with the requirements of the works schedule. 3.3 Scheduling of financial requirements is accurately documented according to **organization guidelines.**
4 Prepare and document the estimate, quote or tender for submission to the client	4.1 Estimate, quote or tender price is calculated and checked according to enterprise guidelines. 4.2 Cost **summaries** and works, resource and financial schedules are compiled according to organization specifications. 4.3 Quality assurance requirements, organization customer service procedures, conventional formatting and industry standards are strictly adhered to in the development of documentation. 4.4 Total estimate, quotation and/or tender is completed accurately and submitted to the organization within the specified deadline. 4.5 Further information is provided and adjustments made according to client requirements.

Variable	**Range statement**
Project	The subject of the Bid documents or tender may include works relating to Biomedical Equipment management-related activities.
Client may include	The organization's management, or a private individual, company, community group, government agency or a combination of these entities.
Relevant documentation may include	schematic and detailed drawings, tender specifications, specified items recorded on a tender title sheet, technical data, manufacturers' specifications, enterprise policies and procedures, catalogues, price lists, project plans, designs and management plans, client financial limitations and allocations, OHS standards, statutory requirements, , Codes of Practice, quality assurance requirements, timeline specifications, and legislation, industrial awards and enterprise agreements relating to labour and works.
Resources may include	Materials, tools, equipment and machinery, labour hours, staffing levels, technical skills and management requirements, consultant time and contracted services.
Sources may include	Suppliers, manufacturers, equipment and labour hire agencies, contractors, consultants, or the client enterprise which may already have some or all of the required resources.
Tools and equipment may include	Computing hardware, accounting, drafting and data base management software, calculators and other accounting tools and equipment.
Works schedules factors may include	Details of labour requirements, staged implementation and objectives, prioritizing of work activities, and scheduling of works, resource orders and deliveries.
Organization guidelines may include	Compliance with industry best practice standards, *Organization* customer service policy, legal requirements, insurance limitations and guidelines, and enterprise OHS policy.
Summary items may	Preliminary costs, summation of resource materials, equipment and

include	labour required, and abstract sums.
Documentation format may include	Hand written, typed and printed hard copy or electronic formats, and may also support audiovisual, slide and photographic presentation.

Evidence Guide	
Critical Aspects of Competence	A candidate must be able to demonstrate the ability to: • prepare Bid document, Evaluate and tenders • negotiate effectively with a client and follow a logical plan to develop and document all aspects • Identify and interpret enterprise and industry standards and practices for formatting, organizing and presenting financial and quantitative information. • Research and evaluate information. • Carry out financial, logistical and spatial estimations and calculations. • Evaluate, collate, calculate and present data regarding costs and resource requirements for the project.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • Relevant legislation, awards, enterprise agreements and management policies relating to labour hire and employment terms. • Current pricing structures and options for supplies, services, contractors and consultants. • Enterprise and industry standards and practices for formatting, organizing and presenting financial and quantitative information. • Organizational ethics in relation to confidentiality and the tendering process.
Underpinning Skills	skills include the ability to: • Communicate and negotiate orally and in writing with staff, management, clients, contractors, suppliers, manufacturers and consultants. • Liaise effectively with difficult clients and resolve issues. • Research and evaluate information. • Carry out financial, logistical and spatial estimations and calculations. • Comply with legislative requirements. • collect, analyze and organize information estimates, quotes and/or tenders, • including statistical, logistical and financial data • Evaluate, collate, calculate and present data regarding costs and resource requirements for the project. • use of technology to record, store and communicate ideas and information, research relevant information, obtain and calculate data and produce an estimate, quote or tender.
Resources Implication	The following resources MUST be provided. • Access is required to real or appropriately simulated situations, including work areas, materials and equipment,

	• Documentation and information on workplace practices and OHS practices. • specifications and work instructions • Approved assessment tools • Certified assessor /Assessor's panel
Methods of Assessment	Competence may be assessed through: • Practical assessment by direct observation of tasks through simulation/Role-plays • Written exam/test on underpinning knowledge • questioning or interview on underpinning knowledge • project-related conditions (real or simulated) and require evidence of process • Portfolio Assessment (e.g. Certificate from training providers or employers) Assessment methods must confirm the ability to access and correctly interpret and apply the essential underpinning knowledge
Context of Assessment	Competency may be assessed in the work place or in a simulated work place setting. This competency standard could be assessed on its own or in combination with other competences relevant to the job function.

TOP

Occupational Standard: Biomedical Equipment Technology Management Level V	
Unit of competence	**Implement and monitor Healthcare Technology Management**
Unit Code	**ELE BETM 5 10 0511**
Unit Descriptor	This unit covers the implementation and monitoring of the organization's Biomedical Equipment Technology Management /BMTM/ policies and procedures as an integral part of the organization's business program. Those who work or who expect to work in a supervisory capacity would be advised to undertake this unit. It could also be useful for small business.

Elements	Performance Criteria
1. Provide information to the work team	1.1 Information provided to the work team is explained in a clear and concise manner and is readily accessible by all employees 1.2 Organization's activities/performance in regard to **Biomedical Equipment Technology Management /BMTM/** service quality are conveyed to work team where required 1.3 Links between **Biomedical Equipment Technology Management /BMTM/**, financial, safety and other risk areas and how these are integrated in organizational policies and practices are explained 1.4 Information on **Biomedical Equipment Technology Management /BMTM/** systems and procedures and other risk areas within the area of management responsibility is provided
2. Implement and monitor operational procedures	2.1 Existing and potential **Biomedical Equipment Technology Management /BMTM/** risks are identified and assessed and/or expert advice sought as required 2.2 Prioritized recommendations from the assessments are carried out as part of the organization's operational procedures 2.3 Organizational **Biomedical Equipment Technology Management /BMTM/** policies and procedures are implemented 2.4 Tasks are allocated and outcomes are monitored in accordance with organizational policies and targets 2.5 Contingency plan is implemented promptly when incidents occur
3. Implement and monitor change and continuous improvement	3.1 **Biomedical Equipment Technology Management /BMTM/** improvement plans are implemented for own work group and integrated with other operational activities 3.2 Best practice approaches to improving **Biomedical Equipment Technology Management** performance by reducing **medical equipment related** risk and waste are identified, implemented and monitored 3.3 Suggestions and ideas about **Biomedical Equipment Technology Management** management are sought from the work team and acted upon where appropriate 3.4 Suggestions are sought from supply chain, at tender/contract stage, for ways of improving **Biomedical Equipment delivery**

	service performance
4. Implement and monitor recording procedures	4.1 Internal and external reporting procedures are identified and implemented as required 4.2 **Biomedical Equipment Technology Management** records are accurately and legibly maintained and stored securely in a form accessible for reporting purposes 4.3 Information/records are monitored to identify trends that may require remedial action, and used to promote continuous improvement of **Biomedical Equipment delivery service** performance
5. Implement and monitor an environmental management training program	5.1 **Biomedical Equipment Technology Management** training needs are identified accurately, specifying gaps between **Biomedical Equipment Technology Management** competencies required and those held by group members 5.2 Arrangements are made for fulfilling identified training needs for the work group with relevant parties

Variable	**Range Statement**
Legislation, codes and national standards relevant to the workplace which may include:	award and enterprise agreements and relevant Biomedical Equipments 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 relevant industry codes of practice
Knowledge of legislation, codes, national standards, industry codes of practice and workplace policies and procedures must:	• be strictly relevant to the particular workplace role and is not intended to include detailed technical aspects of Biomedical Equipment Technology Management and details of legislation must be directly relevant to the workplace role, and would normally be delivered as a general awareness issue rather than a major part of the competencies • be consistent with the concept that people at this level, while working with some autonomy and possibly responsibility for the work of others, still generally work according to workplace policies and procedures
Information may include:	• organizational policies and procedures • relevant Biomedical Equipment Technology Management , environmental legislation requirements • voluntary environmental agreements entered into with external organizations • continuous improvement policies and processes for the organization • Biomedical equipment related data
Work team may include:	formal or unstructured groups two or more people
Biomedical Equipment Technology Management performance may be	• a measure of an organization's impact on the Biomedical Equipment Technology Management and of their ability to manage for the betterment of quality health service delivery

defined as:	
Some approaches to Biomedical Equipment Technology Management performance may include but are not restricted to:	• preventing and minimizing risk associated to biomedical usage and disposal • improving Biomedical Equipment Technology Management
Biomedical Equipment Technology Management policies must be appropriate to the scope and scale of the organization and may include:	Biomedical Equipment Technology Management to improve the quality of health delivery system and minimize risk associated to Biomedical Equipment Technology
Biomedical Equipment Technology Management training program should be:	integrated into the organization's existing training arrangements

Evidence Guide	
Critical Aspects of Competence	Assessment must confirm one's ability to: Describe relevant legislation from all levels of government that affects organization operation communicate with others to ensure information comprehend documentation Plan and organize activities
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: relevant legislation from all levels of government that affects organization operation, Occupational Health and Safety and environmental issues, relevant Biomedical Equipment Technology Management systems and procedures knowledge of best practice approaches relevant to own work area quality assurance systems relevant to own work area
Underpinning Skills	Demonstrates skills to: • communication skills to ensure information is supplied to the work team • consultation skills to assist in workplace negotiations literacy skills for comprehending documentation and interpreting Biomedical Equipment Technology Management requirements • Operational skills relevant to the workplace, including the ability to operate and shut down equipment ability to relate to people from a range of social, cultural and ethnic

	backgrounds and physical and mental abilities. • Collect, analyze and organize information to provide information and advice. • Communicate ideas and information to resolve environmental issues with the work team and external contacts. • Plan and organize activities to plan training and to implement change and improvement
Resources Implication	The following resources MUST be provided. Access is required to real or appropriately simulated situations, including work areas, materials and equipment, Documentation and information on workplace practices and OHS practices. specifications and work instructions Approved assessment tools Certified assessor /Assessor's panel
Methods of Assessment	Competence may be assessed through: Practical assessment by direct observation of tasks through simulation/Role-plays Written exam/test on underpinning knowledge questioning or interview on underpinning knowledge project-related conditions (real or simulated) and require evidence of process Portfolio Assessment (e.g. Certificate from training providers or employers) Assessment methods must confirm the ability to access and correctly interpret and apply the essential underpinning knowledge
Context of Assessment	Competency may be assessed in the work place or in a simulated work place setting Evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations

TOP

Occupational Standard: Biomedical Equipment Technology Management Level V	
Unit of Competence	**Establish Quality Standards**
Unit Code	**ELE BETM 5 11 0511**
Unit Descriptor	This unit covers the knowledge, attitudes and skills required to monitor quality of work, establish quality specifications for product/equipment, participate in maintaining and improving quality at work, identify hazards and critical control points in application of equipment, assist in planning of quality assurance procedures, report problems that affect quality and implement quality assurance procedures.

Element of Competence	Performance Criteria
1. Establish quality specifications for product	1.1 Market specifications are **sourced** and ***legislated requirements*** identified. 1.3 Quality specifications developed and agreed upon 1.4 Quality specifications are documented and introduced to organization staff / personnel in accordance with the organization policy 1.5 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 to monitor the effectiveness of quality assurance procedures are developed.
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 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 Recognize potential or existing quality problems. 7.2 Identify instances of variation in quality from specifications or work instructions. 7.3 Report variation and potential problems to supervisor/manager according to enterprise guidelines.

Variable	**Range statement**
Sourced	May include but not limited to: • Purchasers of the product e.g., processors or end-use customers.
Legislated requirements	May include but not limited to: • Verification of product quality as part of consumer legislation or specific legislation related to product content or composition.
Safety procedures.	It may include but not limited to: • Use of tools and equipment for laboratory examination of animal products • 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 laboratory examination of animal products
Materials	May include but not limited to: • swabs and plastic bags/containers to collect specimens, plastic or rubber disposable gloves, bucket, scrubbing brush, gauze, cotton and plasters • aluminum foils, gowns, apron, rubber boots, disinfectants, antiseptics, scalpel blade, saline water, distilled water, stationeries, tap water, alcohol, and soap, detergents, protective eyewear, overall, cleaning reagents cleaning materials
Tools and Equipment	May include but not limited to: • projector, white board, computers, printers, calculators, copying machines, ausy kit, bucket, wheelbarrow/trolley for disposal of carcass, standard abattoir equipments, different quality evaluating equipments.

Evidence Guide	
Critical Aspect of Competence	Assessment must confirm one's ability 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 and Attitude	Demonstrates knowledge of: • Veterinary public health policies and procedures • Obtaining and using information about animal and zoonotic diseases • Applying federal, regional state or territory legislation within day-today work activities • Accessing and using management systems to keep and maintain accurate records • Requirements for correct preparation, labelling and packaging of biological and potentially hazardous samples
Underpinning Skills	Demonstrates skills in: • Monitoring quality of work • Establishing quality specifications for product • Participating in maintaining and improving quality at work • Identifying hazards and critical control points in the production of quality product • Assisting in planning of quality assurance procedures • Reporting problems that affect quality • Implementing quality assurance procedures
Resource Implications	The following resources MUST be provided. • Access is required to real or appropriately simulated situations, including work areas, materials and equipment, • Documentation and information on workplace practices and OHS practices. • specifications and work instructions • Approved assessment tools • Certified assessor /Assessor's panel
Assessment Methods	Competence may be assessed through: • Practical assessment by direct observation of tasks through simulation/Role-plays • Written exam/test on underpinning knowledge • questioning or interview on underpinning knowledge • project-related conditions (real or simulated) and require evidence of process • Portfolio Assessment (e.g. Certificate from training

	providers or employers) Assessment methods must confirm the ability to access and correctly interpret and apply the essential underpinning knowledge
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting

TOP

Occupational Standard: Biomedical Equipment Technology Management Level V	
Unit Title	**Facilitate and Capitalize on Change and Innovation**
Unit Code	**EEL EET5 12 0511**
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 ***Manager*** contributes effectively to the organization's planning processes to introduce and facilitate change 1.2 Plans to introduce change are made in consultation with ***appropriate stakeholders*** 1.3 Organization's objectives and plans to introduce change are communicated effectively to individuals and teams
2. Develop creative and flexible approaches and solutions	2.1 Variety of approaches to managing workplace issues and problems are identified and analyzed 2.2 ***Risks*** are identified and assessed, and action initiated to manage these to achieve a recognized benefit or advantage to the organization 2.3 Workplace is managed in a way which promotes the development of innovative approaches and outcomes 2.4 Creative and responsive approaches to resource management improve productivity and services, and/or reduce costs
3. Manage emerging challenges and opportunities	3.1 Individuals and teams are supported to respond effectively and efficiently to changes in the organization's goals, plans and priorities 3.2 Coaching and mentoring assist individuals and teams to develop competencies to handle change efficiently and effectively 3.3 Opportunities are identified and taken as appropriate, to make adjustments and to respond to the changing needs of customers and the organization 3.4 ***Information needs*** of individuals and teams are anticipated and facilitated as part of change implementation and management 3.5 Recommendations for improving the methods and techniques to manage change are identified, evaluated and negotiated

	with appropriate individuals and groups

Variables	Range
Manager	a person with frontline management roles and responsibilities, regardless of the title of their position
Appropriate stakeholders may refer to:	those individuals and organizations who have a stake in the change and innovation being planned, including: • 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
Risks may refer to:	• any event, process or action that may result in goals and objectives of the organization not being met • any adverse impact on individuals or the organization • various risks identified in a risk management process
Information needs may include:	• 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 • customer/competitor data

Evidence Guide	
Critical Aspects of Competence	• Planning the introduction and facilitation of change • Developing creative and flexible approaches and solutions • Managing emerging challenges and opportunities
Underpinning Knowledge and Attitudes	• 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 • 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	• Communication skills • Planning work • Managing risk
Resources Implication	The following resources must be provided: • Workplace or fully equipped assessment location with necessary tools, equipment and consumable materials
Assessment Methods	Competence may be assessed through: • Interview • Observation/Demonstration
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting

TOP

Occupational Standard: Biomedical Equipment Technology Management Level V	
Unit Title	**Practice Career Professionalism**
Unit Code	**EEL EET5 13 0511**
Unit Descriptor	This unit covers the knowledge, skills and attitudes in promoting career growth and advancement.

Elements	Performance Criteria
1. Integrate personal objectives with organizational goals	1.1 Personal growth and work plans are pursued towards improving the qualifications set for the profession 1.2 Intra- and interpersonal relationships are maintained in the course of managing oneself based on performance ***evaluation*** 1.3 Commitment to the organization and its goal is demonstrated in the performance of duties
2. Set and meet work priorities	2.1 Competing demands are prioritized to achieve personal, team and organizational goals and objectives. 2.2 ***Resources*** are utilized efficiently and effectively to manage work priorities and commitments 2.3 Practices along economic use and maintenance of equipment and facilities are followed as per established procedures
3. Maintain professional growth and development	3.1 ***Trainings and career opportunities*** are identified and availed of based on job requirements 3.2 ***Recognitions*** are -sought/received and demonstrated as proof of career advancement 3.3 ***Licenses and/or certifications*** relevant to job and career are obtained and renewed

Variables	Range
Evaluation	• Performance Appraisal • Psychological Profile • Aptitude Tests
Resources	• Human • Financial • Technology ▪ Hardware ▪ Software
Trainings and career opportunities	• Participation in training programs ▪ Technical ▪ Supervisory ▪ Managerial

	▪ Continuing Education • Serving as Resource Persons in conferences and workshops
Recognitions	• Recommendations • Citations • Certificate of Appreciations • Commendations • Awards ▪ Tangible and Intangible Rewards
Licenses and/or certifications	• National Certificates • Certificate of Competence Support Level Licenses • Professional Licenses

Evidence Guide	
Critical aspects of Competency	Assessment requires evidence that the candidate: • Attained job targets within key result areas (KRAs) • Maintained intra - and interpersonal relationship in the course of managing oneself based on performance evaluation • Completed trainings and career opportunities which are based on the requirements of the industries • Acquired and maintained licenses and/or certifications according to the requirement of the qualification
Underpinning Knowledge	• Work values and ethics (Code of Conduct, Code of Ethics, etc.) • Company policies • Company-operations, procedures and standards • Fundamental rights at work including gender sensitivity • Personal hygiene practices
Underpinning Skills	• Appropriate practice of personal hygiene • Intra and Interpersonal skills • Communication skills
Resource Implications	The following resources must be provided: Workplace or assessment location • Case studies/scenarios
Methods of Assessment	Competency may be assessed through: Interview / Exams and Tests Simulation/Role-plays Observation / demonstration
Context for Assessment	Competency may be assessed in the work place or in a simulated work place setting

TOP

Occupational Standard: Biomedical Equipment Technology Management Level V	
Unit Title	**Establish and Conduct Business Relationships**
Unit Code	**EEL EET5 14 0511**
Unit Descriptor	This unit covers the skills, attitudes and knowledge required to manage business relationship with customers within the industry context.

Elements	Performance Criteria
1. Establish contact with customer	1.1 Welcoming customer environment is maintained 1.2 Customer is greeted warmly according to enterprise policies and procedures 1.3 Effective service environment is created through verbal and non-verbal presentation according to enterprise policies and procedures 1.4 Customer data is maintained to ensure database relevance and currency 1.5 Information on customers and service history is gathered for analysis 1.6 ***Opportunities*** to maintain regular contact with customers are identified and taken up
2. Clarify needs of customer	2.1 Customer needs are determined through questioning and active listening 2.2 Customer needs are accurately assessed against the products/services of the enterprise 2.3 Customer details are documented clearly and accurately in required format 2.4 Conduct negotiations in a business-like and professional manner 2.5 Maximize benefits for all parties in the negotiation through use of established ***techniques*** and in the context of establishing long term relationships 2.6 Communicate the results of negotiations to appropriate colleagues and stakeholders within appropriate timeframes
3. Provide information and advice	3.1 Features and benefits of products/services provided by the enterprise are described/recommended to meet customer needs 3.2 Information to satisfy customer needs is provided 3.3 Alternative sources of information/advice are discussed with the customer
4. Foster and	4.1 Pro-actively seek, review and act upon information needed to

maintain business relationships	maintain sound business relationships. 4.2 Honor agreements within the scope of individual responsibility. 4.3 Make adjustments to agreements in consultation with the customer and share information with appropriate colleagues. 4.4 Nurture relationships through regular contact and use of effective interpersonal and communication styles.

Variables	**Range**
Opportunities to maintain regular contact with customers may include:	• informal social occasions • industry functions • association membership • co-operative promotions • program of regular telephone contact
Negotiation techniques	• identification of goals, limits • clarification of needs of all parties • identifying points of agreement and points of difference • preparatory research of facts • active listening and questioning • non-verbal communication techniques • appropriate language • bargaining • developing options • confirming agreements • appropriate cultural behaviour

Evidence Guide	
Critical Aspects of Competence	It is essential that competence is fully observed and there is ability to transfer competence to changing circumstances and to respond to unusual situations in the critical aspects of: • consistently applying enterprise policies and procedures and industry codes of practice in regard to customer service • providing a quality service environment by treating customers in a courteous and professional manner through all stages of the procedure • using effective questioning/active listening and observation skills to identify customer needs • communicating effectively with others involved in or affected by the work • maintaining relevant and current customer databases in accordance with enterprise policies and procedures • ability to build and maintain relationships to achieve successful business outcomes
Required knowledge	• Operational knowledge of enterprise policies and procedures in regard to:

	▪ customer service ▪ dealing with difficult customers ▪ maintenance of customer databases ▪ allocated duties/responsibilities ▪ General knowledge of the range of enterprise merchandise and services, location of telephone extensions and departments/sections • Basic operational knowledge of legislation and statutory requirements, including consumer law, trade practices and fair trading legislation • Basic operational knowledge of industry/workplace codes of practice in relation to customer service • negotiation and communication techniques appropriate to negotiations that may be of significant commercial value
Underpinning Skills	• Use workplace technology related to use of customer database • Collect, organize and understand information related to collating and analyzing customer information to identify needs • Communicate ideas and information • Plan and organize activities concerning information for database entries • Use mathematical ideas and techniques to plan database cells and size • Establish diagnostic processes which identify and recommend improvements to customer service
Resources Implication	The following should be made available: • a workplace or simulated workplace • documentation, such as enterprise policy and procedure manuals relating to customer service
Assessment Methods	Competence may be assessed through: • Interview / Written Test • Observation/Demonstration with Oral Questioning
Context of Assessment	Elements of competence contain both knowledge and practical components. Knowledge components may be assessed off the job. Practical components should be assessed on the job or in a simulated work environment.

TOP

Level V	
Unit Title	**Develop and Refine Systems for Continuous Improvement in Operations**
Unit Code	**EEL EET5 15 1012**
Unit Descriptor	This unit of competency covers the skills, knowledge and processes required to ensure that continuous improvement systems do not stultify and continue to improve along with other operational systems in an organization. This unit is about improving the process yield/unit of effort or cost, reducing process variation and increasing process reliability, upgrading, enhancing or refining process outputs, and includes developing a culture of reviewing and sustaining change ensuring improvements are maintained and built on.

Elements	Performance Criteria
1. Establish parameters of current internal improvement systems	1.1 Describe ***organization systems*** that impact on continuous improvement 1.2 Identify current ***relevant metrics*** and their values 1.3 Check that metrics are collected for all improvements 1.4 Determine ***yield of current improvement processes*** 1.5 Review results of improvements
2. Distinguish breakthrough improvement processes	2.1 Identify all ***improvements*** which have occurred over an agreed period of time 2.2 Distinguish between ***breakthrough improvements*** and continuous improvements 2.3 Determine the timing of breakthrough improvement processes 2.4 Analyze factors controlling the ***timing*** and selection of breakthrough improvements 2.5 Analyze ***continuous improvements*** to identify cases where breakthrough improvements were required 2.6 Validate findings with process/system owners and obtain required approvals 2.7 Improve timing/selection of breakthrough improvements 2.8 Improve other factors limiting the gains from breakthrough improvements
3. Develop continuous improvement practice	3.1 Check that levels of delegated authority and responsibility are appropriate for continuous improvement from the shop floor 3.2 Ensure all personnel have appropriate capabilities for

	continuous improvement processes 3.3 Ensure personnel and systems recognize potential breakthrough improvement projects 3.4 Ensure sufficient resources are available for the operation of continuous and breakthrough improvement processes 3.5 Check that relevant information flows from improvement changes to all required areas and stakeholders 3.6 Check data collection and metrics analysis capture changes which result from improvement actions 3.7 Check that improvement changes are standardized and sustained 3.8 Check review processes for routine continuous improvements 3.9 Remove or change factors limiting gains from improvements 3.10 Modify systems to ensure appropriate possible changes are referred to other improvement processes 3.11 Institutionalize breakthrough
4. Establish parameters of current external improvement system	4.1 Review ***value stream*** systems that impact on improvement 4.2 Review procedures for deciding improvement methodologies Identify current relevant metrics and their values, as appropriate 4.3 Determine yield of current improvement processes 4.4 Review results of improvements
5. Explore opportunities for further development of value stream improvement processes	5.1 Review mechanisms for consultation with value stream members 5.2 Develop mechanisms for further improving joint problem solving 5.3 Develop mechanisms for increased sharing of organizational knowledge 5.4 Obtain support and necessary authorizations from process/system owners 5.5 Capture and standardize improvements 5.6 Improve factors limiting gains from continuous improvements
6. Review systems for compatibility with improvement strategy	6.1 Review all systems which impact or are ***impacted on improvements*** and the improvement system 6.2 Analyze relationships between improvement systems and other relevant systems

	6.3 Analyze practices caused by and results from the systems 6.4 Negotiate changes to the systems to improve the outcomes from improvement systems 6.5 Obtain necessary approvals to implement changes 6.6 Monitor the implementation of the changes

Variable	**Range**
Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • JIT, kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree • Competitive systems and practices should be interpreted so as to take into account: – stage of implementation of competitive systems and practices – the size of the enterprise – the work organization, culture, regulatory environment and the industry sector
Code of practice and standards	Where reference is made to industry codes of practice, and/or Ethiopian/international standards, the latest version must be used
Organization	Organization systems may include:

systems	• problem recognition and solving • operational/process improvement • improvement projects • product/process design and development • processes for making incremental improvements
Relevant metrics	Relevant metrics include all those measures which might be used to determine the performance of the improvement system and may include: • hurdle rates for new investments • KPIs for existing processes • quality statistics • delivery timing and quantity statistics • process/equipment reliability (‘uptime’) • incident and non-conformance reports • complaints, returns and rejects
Process improvement yield	Improvement process yield may be regarded as: • the benefit achieved for the effort invested
Breakthrough improvements	Breakthrough improvements include: • those which result from a kaizen blitz or other improvement project or event and are a subset of all improvements
Timing of breakthrough improvements	Timing of breakthrough improvements includes: • frequency (which should be maximized) and duration (which should be minimized) of events/projects
Continuous improvement	Continuous improvement is part of normal work and does not require a special event to occur (although may still require authorizations) and contrasts with breakthrough improvement/kaizen blitz which occurs by way of an event or project
Resources for improvement	Resources for improvements include: • improvement budget • guidelines for trialing of possible improvements • mechanism for approvals for possible improvements • business case guidelines for proposed improvements • indicators of success of proposed improvement • mechanisms for tracking and evaluation of changes • forum for the open discussion of the results of the implementation • mechanisms for the examination of the improvement for additional improvements • organization systems to sustain beneficial changes
Capturing value stream improvements	Capturing value stream improvements includes: • revised contractual arrangements • revised specifications • signed agreements • other documented arrangements which formalize the raised base line
Systems impacting	Systems which impact/are impacted on improvements and the

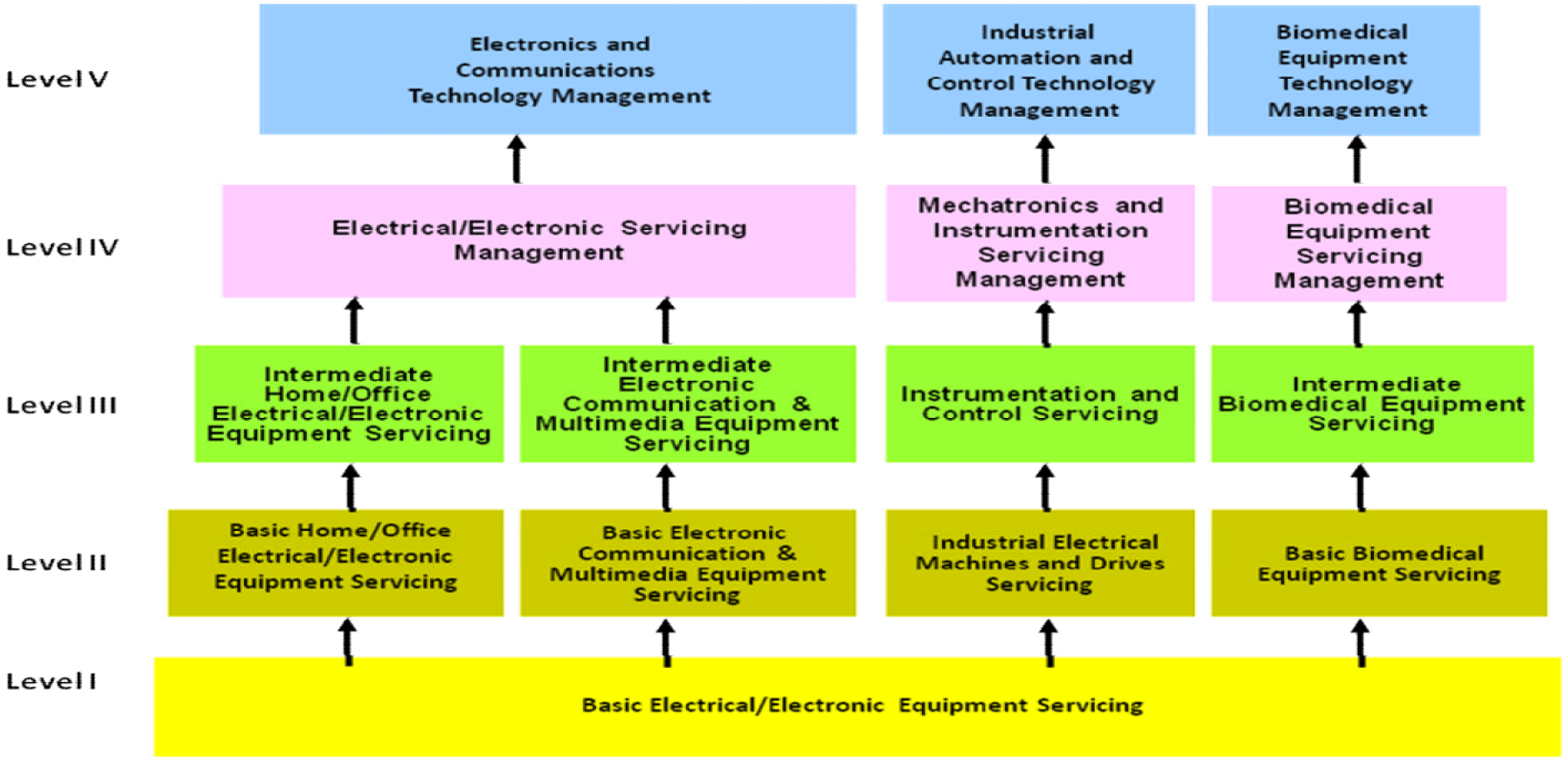
improvements	improvement system include: • office • purchasing • rewards (individual or team at all levels) • sales • marketing • maintenance • process/product • transport and logistics
Organizational knowledge	Organizational knowledge should: • be able to be quantified or otherwise modified to make its outcomes measurable or observable • be able to be expressed in an accessible and distributable form appropriate to the organization operations and stakeholders
Improvements	Improvements may: • be to process, plant, procedures or practice • include changes to ensure positive benefits to stakeholders are maintained
Manager	Manager may include: • any person who may have either a permanent or an ad hoc role in facilitating the function of multiple teams in a workplace, departments or entire organizations

Evidence Guide	
Critical Aspects of Competence	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • critically review current continuous improvement processes • establish ongoing review of continuous improvement processes • implement improvements in the practice of continuous improvement • better align internal and external systems • gather data through interviews with stakeholders • review existing data • obtain additional data through a variety of techniques • communicate and negotiate at all levels within the organization
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • competitive systems and practices tools, including: • value stream mapping • 5S • Just in Time (JIT) • mistake proofing • process mapping • establishing customer pull

	• kaizen and kaizen blitz • setting of KPIs/metrics • 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 • cost/benefit analysis methods • methods of determining the impact of a change • advantages and disadvantages of communication media, methods and formats for different messages and audiences • customer perception of value • define, measure, analyze, improve, and control and sustain (DMAIC) process
Underpinning Skills	Demonstrates skills to: • undertaking 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 • communicating at all levels in the organization and value stream and to audiences of different levels of literacy and numeracy • analyzing current state/situation of the organization and value stream • determining and implementing the most appropriate method for capturing value stream improvements • collecting and interpreting data and qualitative information from a variety of sources • analyzing individually and collectively the implementation of competitive systems and practices tools in the organization and determining strategies for improved implementation • relating implementation and use of competitive systems and practices and continuous improvement to customer benefit • solving highly varied and highly specialized problems related to competitive systems and practices implementation and continuous improvement to root cause • negotiating with stakeholders, where required, to obtain information required for implementation and refinement of continuous improvements, including management, unions, value stream members, employees and members of the community • reviewing 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’) – incident and non-conformance reports – implementing continuous improvement to support systems and areas, including maintenance, office, training and human resources
Resources Implication	Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies
Methods of Assessment	Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • suitable simulation • oral or written questioning to assess knowledge of principles and techniques associated with change management In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge
Context of Assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.

Sector: Electrotechnology and Telecommunication
Sub-Sector: Electrotechnology



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