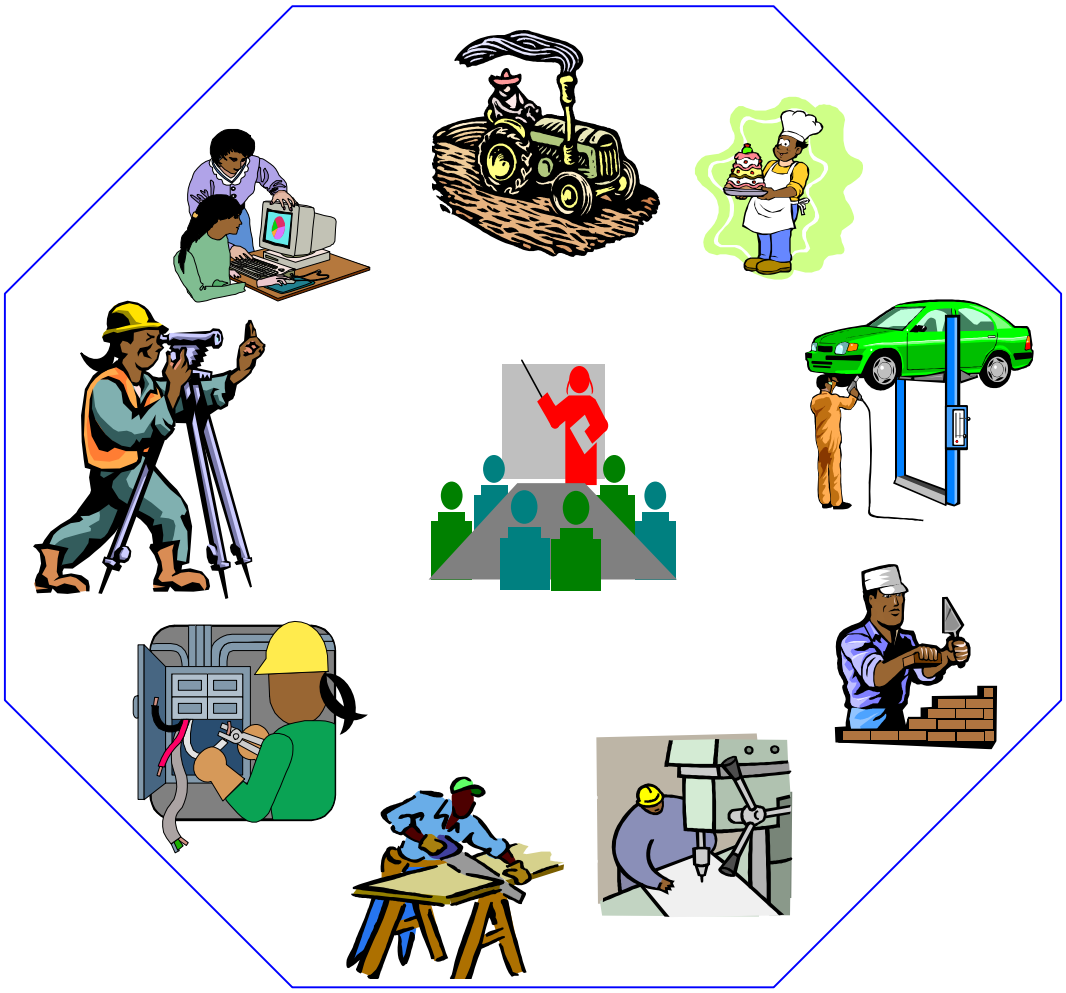
Federal Democratic Republic of Ethiopia

OCCUPATIONAL STANDARD

INDUSTRIAL AUTOMATION AND CONTROL 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: Industrial Automation and Control Technology Management

Occupational Code : EEL IAC

NTQF Level V

EEL IAC5 01 0511 Design Electronic Control Systems	EEL IAC5 02 0511 Write Specifications for Industrial Electronics and Control Projects	EEL IAC5 03 0511 Select Equipment for Process Control Systems
EEL IAC5 04 0511 Install Process Control Apparatus and Associated Equipment	EEL IAC5 05 0511 Set-up Process Measuring and Control Instruments	EEL IAC5 06 0511 Set-p and Adjust Process Control Loops
EEL IAC5 07 0511 Verify Compliance and Functionality of Process Control Installations	EEL IAC5 08 0511 Set-up Electronically Controlled Complex Systems	EEL IAC5 09 0511 Perform Commissioning of Process Control Systems
EEL IAC5 10 0511 Solve Problems in Process Controller, Transmitter and Converter	EEL IAC5 11 0511 Find and Rectify Faults in Process Control Systems	EEL IAC5 12 0511 Plan Control System Projects
EEL IAC5 13 0511 Manage Control Projects	EEL IAC5 14 0511 Compile and Produce Electrotechnology Report	EEL IAC5 15 0511 Manage Risk in Electro-technology Activities
EEL IAC5 16 0511 Facilitate and Capitalize on Change and Innovation	EEL IAC5 17 0511 Practice Career Professionalism	EEL IAC5 18 0511 Establish and Conduct Business Relationships
EEL IAC5 19 1012 Develop and Refine Systems for Continuous Improvement in Operations		

TOP

Occupational Standard: Industrial Automation & Control Technology Management Level V	
Unit Title	**Design electronic control system**
Unit Code	**ELE IAC5 01 0511**
Unit Descriptor	This unit covers designing electronic control systems incorporating closed loop and digital and analogue elements. It encompasses working safely, following design brief, applying knowledge of digital and analogue devices, interpreting device specifications, constructing prototypes, using appropriate development software, applying programming techniques, testing developed system prototype operation and documenting design and development work.

Elements	Performance Criteria
1 Prepare and plan to design electronic control systems	1.1 **OH& S** processes and procedures for a given work area are identified, obtained and understood 1.2 Established **OH& S** risk control measures and procedures are followed in preparation for the work. 1.3 The extent of the proposed electronic control system is determined from the design brief or in consultations with appropriate person(s) 1.4 Design development work is planned to meet scheduled timelines in consultation with others involved on the work site 1.5 **Materials** and devices/components required for the work are determined on compatibility of their specifications with control system requirements and project budget constraints
2 Design electronic control systems	2.1 OH& S risk control work measures and procedures are followed. 2.2 Knowledge of digital and analogue elements used in control systems and compliance standards are applied to the design 2.3 Alternative arrangements for the design are considered based on the requirements outlined in the design brief. 2.4 Safety, functional and budget considerations are incorporated in the design. 2.5 Prototype devices and circuits are constructed, programmed and tested for compliance with the design

	brief and regulatory requirements. 2.6 Prototype malfunctions are rectified and retested to ensure effective operation of design. 2.7 Control system design is documented for submission to appropriate person(s) for approval 2.8 Solutions to unplanned situation are provided consistent with organization policy.
3 Obtain approval for electronic control systems design	3.1 Control system design is presented and explained to client representative and/or other relevant person(s). 3.2 Requests for alterations to the design are negotiated with relevant person(s) within the constraints of organization policy. 3.3 Final design is documented and approval obtained from appropriate person(s). 3.4 Quality of work is monitored against personal performance agreement and/or established organizational or professional standards

Variables	**Range**
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: o Using of relevant protective clothing and equipment, o use of tooling and equipment, o workplace environment and safety handling of material, o use of fire fighting equipment, enterprise first aid, o hazard control and hazardous materials and substances. o Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc, o Following Occupational health and safety procedures designated for the task o Checking and fulfilling required safety devices before starting operation Apply safe operating procedures regarding: o electrical safety, o machinery movement and operation, o manual and mechanical lifting and shifting,

	o working in proximity to others and site visitors. Apply emergency procedures : o emergency shutdown and stopping of equipment, o using extinguishing fires, first aid application and site evacuation
Material	include but not limited to: • activity sheets • Schematic diagrams • Component layout • Technical brochures • Technical references • Solder lead • Shielded cable • Terminal lugs • Terminal strips/blocks • Cotton gloves • Plastic tubing • Quick-connect fittings • Electrical tape • Wire markers • Cable/cable ties • PCB
Tools and Equipment	Breadboard, electronic tool kit include multi meter, computer, design and simulator software, oscilloscope

Evidence guide	**Descriptions**
Critical Aspects of Competence	Assessment require evidence that 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: • Design electronic control systems including: • Developing outlines of alternative designs, • Developing the design within the safety and functional requirements and budget limitations, • Documenting and presenting design effectively, • Successfully negotiating design alteration requests • Obtaining approval for final design • 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
Underpinning knowledge	include but not limited to: • Complex control systems • Intermidate and advanced Printed Circuit Board (PCB) knowledge • Industry/workplace codes of practice • Organization operating procedures, • Manufacturing and designing specifications and instructions • occupational health and safety • Mechatronics standards • Pneumatics & electro-pneumatics • Hydraulics • Industrial motors • Components specification of pneumatic and hydraulic • Problem solving in emergency situation • Electromechanical technology • Drawing Interpretation • Use of test equipment/instrument • principles of instrumentation • process variable measurements (pressure, level, flow, temperature, analysis, etc.)

	• process control theory • process control system (single-loop & multi-loop controllers, DCS, DAS, SCADA, etc) • sensors, transmitters, transducers & converters • programmable logic controllers • control valves and final control elements
Underpinning skill	include but not limited to: • Interpret work instructions • Interpret and define work procedures • Selection and use of proper tools & equipment • Installation skills • Interpretation of Safety work procedures/manual • Problem solving in unplanned events
Resource Implications	include but not limited to: • Workplace or fully equipped assessment location with necessary tools and equipment as well as consumable materials • Testing instruments • 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: Industrial Automation & Control Technology Management Level V	
Unit Title	**Write specifications for electro technology projects**
Unit Code	**ELE IAC5 02 0511**
Unit Descriptor	This unit covers developing requirements to be incorporated into the writing of specifications for electro technology projects. It encompasses determining the safety requirements to be met, establishing client expectations, ensuring cost effective solutions are pursued and documenting design and technical requirements

Elements	Performance criteria
1 Prepare specification requirements	1.1 **OH& S** 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 scenario/requirements established in consultation with appropriate person(s), and regulatory requirements. 2.2 Specification is developed in collaboration with all relevant design professionals and contractors involved in the project. 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 written specification	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	Range
Occupational Health and	Apply OH S requirements in accordance with regulations/codes of

safety(OHS)	practice and enterprise safety policies and procedures. This may include: o Using of relevant protective clothing and equipment, o use of tooling and equipment, workplace environment and safety handling of material, o use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances. o Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc, o Following Occupational health and safety procedures designated for the task o Checking and fulfilling required safety devices before starting operation Apply safe operating procedures regarding: o electrical safety, o machinery movement and operation, o manual and mechanical lifting and shifting, o working in proximity to others and site visitors. Apply emergency procedures : o emergency shutdown and stopping of equipment, o using extinguishing fires, first aid application and site evacuation
Material	Include but not limited to: • 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
Tools and Equipment	Computer, printer and auxiliary equipments

Evidence Guide	Description
Critical aspects of Assessment	Assessment require evidence that the candidate: • 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 • specifications for electro technology projects as described in unit of scope and including: o Establishing the scope and parameters of the specification. o Determining the impact of other related works. o Developing the specification incorporating scenarios and all requirements. o Identifying competencies required for the specifications. o Writing specifications. o Negotiating alterations to the proposed specification successfully. o Obtaining approval of the final specification. o 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.
Underpinning knowledge	Include but not limited to: • 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
Underpinning skill	Include but not limited to: • Interpret work instructions • Interpret and define work procedures • Selection and use of proper tools & equipment • Installation skills • Problem solving in unplanned events
Resource Implications	Include but not limited to: • 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: Industrial Automation & Control Technology Management Level V	
Unit Title	**Select equipment for process control systems**
Unit Code	**EEL IAC5 03 0511**
Unit Descriptor	This unit covers selecting equipment for process control systems to meet performance standards. This encompasses the adoption of process control schemes that meet safety and process requirements, selection of control equipment and interconnecting cabling and tubing/piping based on calculated and deemed-to-comply arrangements.

Elements	Performance Criteria
1 Prepare to select equipment	1.1 The extent and nature of the control system is determined from job specifications. 1.2 Safety and other regulatory requirements to which the control system 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 process control systems.
2 Select control apparatus	2.1 Manufacturer's specifications and limitations of appropriate control apparatus is sought and comparisons made with process parameters and control requirements. 2.2 Control apparatus is selected on compatibility with process parameters and control requirements and environmental conditions. 2.3 Evidence of specified apparatus IP rating is sought from manufacturer where necessary. 2.4 Control valves are selected based on percentage travel, flow and loop-and-process characteristics, optimum size, range ability, ability to cope with process pressures and environmental considerations.
3 Select interconnecting cabling and tubing/piping	3.1 Types of control 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 control system arrangement and specifications for all selected items are documented in accordance with established procedures and forwarded to appropriate person(s).
5. Approve the selected process control system	5.1 Selection is presented and discussed with person(s) of higher authority 5.2 Alterations to the selection resulting from the discussion are negotiated with person(s) of higher authority within the constraints of organization policy. 5.3 Selection is finalized and approval obtained from appropriate person(s).

variables	**Range**
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: o Using of relevant protective clothing and equipment, o use of tooling and equipment, workplace environment and safety handling of material, o use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances. o Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc, o Following Occupational health and safety procedures designated for the task o Checking and fulfilling required safety devices before starting operation Apply safe operating procedures regarding: o electrical safety, o machinery movement and operation, o manual and mechanical lifting and shifting, o working in proximity to others and site visitors. Apply emergency procedures : o emergency shutdown and stopping of equipment,

	o using extinguishing fires, o first aid application and site evacuation
Tools, equipment and material	Meter, mechanical toolkit
Material	Include but not limited • 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

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 process control systems including: o Arranging control system to comply with safety and other regulatory requirements and process functions o Selecting compliant and compatible apparatus o Selecting appropriate control cabling and tubing/piping o Documenting control system arrangement, specification for items selected and reasons for the selections made o 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
Underpinning knowledge	Include but not limited to: • Measurement standards applicable to process instrumentation • Distributive control principles • Instrumentation and control communications • Indicators and methods of recording process data • Process equipment installation requirements and techniques • Process control arrangements and equipment selection • Occupational Health and Safety principles • Instrumentation safe working practices
Underpinning skill	Include but not limited to: • Technical manuals and catalogues • Technical standards, regulations and codes applicable to instrumentation and control • Interpret work instructions • Interpret and define work procedures • Selection and use of proper tools & equipment • Problem solving in unplanned events
Resource Implications	Include but not limited to: • 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: Industrial Automation & Control Technology Management Level V	
Unit Title	**Install process control apparatus and associated equipment**
Unit Code	**ELE IAC5 04 0511**
Unit Descriptor	This unit covers the installation of measurement, monitoring and control apparatus and associated equipment. It encompasses working safely and to installation standards, matching equipment with that specified for a given location, placing and securing equipment accurately, making required pneumatic, hydraulic and electrical circuit connections and completing the necessary installation documentation.

Elements	Performance Criteria
1 Prepare process control apparatus and associated equipment	1.1 OH& S procedures for a given work area are identified, obtained and understood 1.2 Health and safety risks are identified and established risk control measures and procedures in preparation for the work are followed. 1.3 Safety hazards that have not previously been identified are noted, and established risk control measures are implemented. 1.4 Installation of apparatus is prepared in consultation with other affected by the work and sequenced appropriately. 1.5 The nature and location of the work is determined from documentation or appropriate person(s) to establish the scope of work to be undertaken. 1.6 Location of process control apparatus and associated equipment is planned within the constraints of the building structure, significant and regulations. 1.7 Advice is sought from appropriate persons to ensure the work is coordinated effectively with others. 1.8 Material needed for the installation work is obtained in accordance with established procedures and checked against job requirements. 1.9 Tools, equipment and testing devices needed to for the installation work are obtained in accordance with

	established procedures and checked for correct operation and safety. 1.10 Preparatory work is checked to ensure no damage has occurred and that work complies with requirements.
2 Install process control apparatus and associated equipment	2.1 OH& S 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 OH& S requirements and when necessary conducted within established safety procedures. 2.3 Circuits/machines/plant are checked as being isolated where necessary in strict accordance OH& S requirements and procedures 2.4 Process control apparatus and associated equipment is installed to comply with technical standards and job specifications and requirements with sufficient access to affect terminations, adjustment and maintenance. 2.5 Wiring and tubing is terminated at process control apparatus and associated equipment in accordance with manufacture's specifications and functional and regulatory requirements. 2.6 Established methods for dealing with unexpected situations are discussed with appropriate person or persons and documented. 2.7 Unexpected situations are dealt with safely and with the approval of an authorized person. 2.8 Ongoing checks of the quality of installed apparatus are undertaken in accordance with established procedures. 2.9 Apparatus installation is carried out efficiently without waste of materials or damage to apparatus, circuits, the surrounding environment or services and using sustainable energy principles.
3 Completion and report installation activities	3.1 OH& S work completion risk control measures and procedures are followed. 3.2 Work site is cleaned and made safe in accordance with established procedures. 3.3 Final checks are made to that the installed apparatus conforms to requirements. 3.4 'As-installed' apparatus and associated equipment is documented and appropriate person(s) notified in accordance with established procedures

Variables	Range
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: o Using of relevant protective clothing and equipment, o use of tooling and equipment, workplace environment and safety handling of material, o Use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances. o Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc, o Following Occupational health and safety procedures designated for the task o Checking and fulfilling required safety devices before starting operation Apply safe operating procedures regarding: o electrical safety, o machinery movement and operation, o manual and mechanical lifting and shifting, o working in proximity to others and site visitors. Apply emergency procedures : o emergency shutdown and stopping of equipment, o using extinguishing fires, first aid application and site evacuation

Tools and equipment	Electronics tool kit, mechanical toolkit, portable power tool like drilling machine, fixing and support devices, electrical workshop machines
Material	Include but not limited to: • 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
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Evidence guide	**Descriptions**
Critical Aspects of Competence	Assessment requires evidence that the candidate: • 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 • Install process control apparatus and associated equipment as listed as described in unit of competence and including: o Reading and interpreting drawings related to and apparatus locations and tubing electrical circuit connections. o Placing and securing apparatus accurately o Connecting apparatus and associated equipment to comply with requirements. o 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
Underpinning knowledge	Include but not limited to: • Electronic cable and conductor terminations • Technical standards, regulations and codes applicable to instrumentation and control • Process equipment installation requirements and techniques • Occupational Health and Safety principles
Underpinning skill	Include but not limited to: • Pneumatic/hydraulic control tubing/piping • Instrumentation safe working practices
Resource Implications	Include but not limited to: • 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: Industrial Automation & Control Technology Management Level V	
Unit Title	**Set up process measuring and control instruments**
Unit Code	**ELE IAC5 05 0511**
Unit Descriptor	This unit covers the calibration of instruments for measuring chemical and physical characteristics as it applies to the control of processes. It encompasses working safely and to standards, following set-up and calibration procedures, testing and reporting.

Elements	Performance Criteria
1 Prepare to set-up process measuring and control instruments	1.1 OH& S procedures for a given work area are identified, obtained and understood 1.2 Established OH& S 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 Appropriate personnel are consulted to ensure the work is coordinated effectively with others involved on the work site 1.5 Measurement parameters are identified by reviewing process requirements and instrument manufacturer's service manual. 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/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures
2 Set-up process measuring and control instruments	2.1 OH& S risk control measures and procedures for carrying out the work are followed. 2.2 Testing/measuring devices are connected and set up in accordance with requirements for a particular control

	system. 2.3 Measuring instruments are set up and adjusted in accordance with process requirements and instrument manufacturer service manual. 2.4 Established methods for dealing with unexpected situations are discussed with appropriate person or persons and documented. 2.5 Unexpected situations are dealt with safely and with the approval of an authorized person. 2.6 Setting-up 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 set-up activities	3.1 OH& S 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	**Range**
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: o Using of relevant protective clothing and equipment, o use of tooling and equipment, workplace environment and safety handling of material, o Use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances. o Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc, o Following Occupational health and safety procedures designated for the task o Checking and fulfilling required safety devices before starting operation Apply safe operating procedures regarding: o electrical safety, o machinery movement and operation, o manual and mechanical lifting and shifting,

	o Working in proximity to others and site visitors. Apply emergency procedures : o emergency shutdown and stopping of equipment, o using extinguishing fires, o first aid application and site evacuation
Tools and Equipment	Electronics tool kit, mechanical toolkit, portable power tool like drilling machine, fixing and support devices, electrical workshop machines
Material	Include but not limited to: • 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

Evidence guide	**Descriptions**
Critical Aspects of Competence	Assessment requires evidence that the candidate : • 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 • Set up process measuring and control instruments as listed as described in unit of competence and including: o identifying measurement parameters o Setting-up and adjusting in accordance with process requirements and instrument manufacturer's service manual o Documenting adjustment settings with established procedures o 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
Underpinning knowledge	Include but not limited to: • Industrial processes • Indicators and methods of recording process data • Gas analysis • Water analysis • Scientific analysis • Weight measurement principles • Occupational Health and Safety principles
Underpinning skill	Include but not limited to: • Instrumentation safe working practices • Instrument calibration method
Resource Implications	Include but not limited to: • 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: Industrial Automation & Control Technology Management Level V	
Unit Title	**Set up and adjust process control loops**
Unit Code	**ELE IAC5 06 0511**
Unit Descriptor	This unit covers basic setting up and adjustment of controllers and control elements to specified output. It encompasses working safely and to standards, following set-up and adjustment procedures, applying knowledge of process requirements, testing and reporting.

Elements	Performance Criteria
1 Prepare to tune control loop	1.1 OH& S procedures for a given work area are identified, obtained and understood 1.2 Established OH& S 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 Appropriate personnel are consulted to ensure the work is coordinated effectively with others involved on the work site 1.5 Control loop parameters are identified by reviewing process specification and equipment manuals. 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/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures
2 Tune control loop	2.1 OH& S risk control measures and procedures for carrying out the work are followed. 2.2 Testing/measuring devices are connected and set up in accordance with requirements for a particular control system.

	2.3 Control set-point is established and control loop adjusted in accordance with process specification 2.4 Process is observed and decisions made in consultation with process operation personnel to readjusted control loop settings to ensure process demand and output quality is met. 2.5 Process control loops are readjusted as required and checked. 2.6 Established methods for dealing with unexpected situations are discussed with appropriate person or persons and documented. 2.7 Unexpected situations are dealt with safely and with the approval of an authorized person. 2.8 Ongoing checks of the quality of process output are undertaken to ensure control loop is tuned as required. 2.9 Tuning 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 control loop tuning activities	3.1 OH& S 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 Control loop settings are documented and appropriate person(s) notified in accordance with established procedures

Variables	Range
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: o Using of relevant protective clothing and equipment, o use of tooling and equipment, workplace environment and safety handling of material, o use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances. o Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc, o Following Occupational health and safety procedures designated for the task o Checking and fulfilling required safety devices before

	starting operation Apply safe operating procedures regarding: o electrical safety, o machinery movement and operation, o manual and mechanical lifting and shifting, o working in proximity to others and site visitors. Apply emergency procedures : o emergency shutdown and stopping of equipment, o using extinguishing fires, o first aid application and site evacuation
Tools and Equipment	Electronics tool kit, mechanical toolkit, portable power tool like drilling machine, fixing and support devices, electrical workshop machines
Material	Include but not limited to: • 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

Evidence guide	**Descriptions**
Critical Aspects of Competence	Assessment requires evidence that the candidate : • 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 • Set up process measuring and control instruments as listed as described in unit scope and including: o Identifying control loop parameters o Adjusting control loop to satisfy process demand and quality o Documenting control loop settings with established procedures o 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
Underpinning knowledge	Include but not limited to: • Industrial processes • Occupational Health and Safety principles • Instrumentation automatic control modes (proportional ,proportional +integral, proportional +integral+ derivative)
Underpinning skill	Include but not limited to: • Instrumentation safe working practices • Problem solving in unplanned events
Resource Implications	Include but not limited to: • 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: Industrial Automation & Control Technology Management Level V	
Unit Title	**Verify compliance and functionality of process control installations**
Unit Code	**ELE IAC5 07 0511**
Unit Descriptor	This unit covers pre-commissioning testing and visual inspection for verifying that installed process control apparatus 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 process control 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 OH& S 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 OH& S 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 control apparatus is checked for accuracy and clarity and compliance with requirements.
3 Conduct functional and safety testing.	3.1 OH& S 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 OH& S requirements and when necessary conducted within established safety procedures 3.3 Circuits/machines/plant are checked as being isolated where necessary in strict accordance OH& S requirements and procedures. 3.4 Where process control apparatus operates at low voltage arrangements are made for an authorized person to conduct and report on all required electrical safety tests. 3.5 Insulation and continuity tests are conducted on process control cabling operating at extra-low voltage. 3.6 Process control tubing/piping is pressure tested in accordance with established practice. 3.7 Functional and test are checks are conducted on all process control apparatus in accordance with established practice.
4. verify compliance and functionality of process control installations	4.1 functionality is presented and discussed with person(s) of higher authority 4.2 Alterations to the compliance resulting from the discussion are negotiated with person(s) of higher authority within the constraints of organization policy. 4.3 compliance and functionality of process control installations is finalized and approval obtained from appropriate person(s).
5. Report inspection and test findings	5.1 OH& S risk control work completion measures and procedures are followed. 5.2 Work site is cleaned and made safe in accordance with established procedures. 5.3 Non-compliance defects are identified and reported in

	accordance with established procedures. 5.4 Recommendations for rectifying defects are made in accordance with established procedures. 5.5 Verification documentation is completed in accordance with established procedures

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: o Using of relevant protective clothing and equipment, o use of tooling and equipment, o workplace environment and safety handling of material, o use of fire fighting equipment, enterprise first aid, o hazard control and hazardous materials and substances. o Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc, o Following Occupational health and safety procedures designated for the task o Checking and fulfilling required safety devices before starting operation Apply safe operating procedures regarding: o electrical safety, o machinery movement and operation, o manual and mechanical lifting and shifting, o working in proximity to others and site visitors. Apply emergency procedures : o emergency shutdown and stopping of equipment, o using extinguishing fires, o 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
Material	include but not limited to: • 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

Evidence guide	**Descriptions**
Critical Aspects of Competence	Assessment requires evidence that the candidate: • 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 • Range of contexts from the prescribed items below: o Verify compliance and functionality of process control installations as listed as described in unit scope and including: o Selecting correct tools and testing equipment. o Identifying visual non-compliance defects o Using effective methods for conducting tests o Identifying non-compliance from test results.

	o Identifying causes of non-compliance and recommending how these should be rectified. o Completing verification documentation o 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
Underpinning Knowledge	Include but not limited to: • Control system installation, testing and verification methods • Occupational Health and Safety principles • Instrumentation safe working practices
Underpinning skill	Include but not limited to: • Instrumentation safe working practices • Problem solving in unplanned events
Resource Implications	Include but not limited to: • 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: Industrial Automation & Control Technology Management Level V	
Unit Title	**Set up electronically controlled complex systems**
Unit Code	**ELE IAC5 08 0511**
Unit Descriptor	This unit covers the setting up, adjustment, maintenance and modification to electronically controlled mechanically operated complex systems, 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 mechanically operated 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.	1.1 OH& S processes and procedures for a given work area are identified, obtained and understood 1.2 Established OH& S 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	2.1 OH& S 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	**Range**
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: o Using of relevant protective clothing and equipment, o use of tooling and equipment, o workplace environment and safety handling of material, o use of fire fighting equipment, enterprise first aid, o Hazard control and hazardous materials and substances. o Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc, o Following Occupational health and safety procedures designated for the task o Checking and fulfilling required safety devices before starting operation Apply safe operating procedures regarding: o electrical safety, o machinery movement and operation,

	o manual and mechanical lifting and shifting, o working in proximity to others and site visitors. Apply emergency procedures : o emergency shutdown and stopping of equipment, o 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
Materials	Include but not limited to: • 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

Evidence guide	**Descriptions**
Critical Aspects of Competence	Assessment requires evidence that the candidate: • 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

	• Set up electronically controlled mechanically operated complex systems as described and including: o Understanding the operation of electronic and mechanical controls o Forming effective strategies for analyzing circuit and mechanical performance o Obtaining circuit control and mechanical parameters, specifications and performance requirements appropriate to each situation. o Testing the results of the analysis o Documenting instruction for implementing any actions resulting from the analysis that incorporates risk control measure to be followed. o Documenting justification of actions to be implemented in accordance with professional standards o 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
Underpinning knowledge	Include but not limited to: • Occupational health and safety principles • Electronic interfacing to mechanical systems
Underpinning skill	Include but not limited to: • Instrumentation safe working practices • Problem solving in unplanned events
Resource Implications	Include but not limited to: • 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: Industrial Automation & Control Technology Management Level V	
Unit Title	**Perform commissioning of process control systems**
Unit Code	**ELE IAC5 09 0511**
Unit Descriptor	This unit covers commissioning of process control systems. 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 process control systems	1.1 OH& S procedures for a given work area are identified, obtained and understood 1.2 Established OH& S 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 OH& S requirements and when necessary conducted within established safety procedures 1.9 Circuits are checked as being isolated where necessary in strict accordance OH& S requirements and procedures
2. Assist in commissioning process control systems	2.1 OH& S risk control measures and procedures for carrying out the work are followed. 2.2 Commissioning testing/measuring devices are connected

	and set up in accordance with requirements for a particular control system and 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 OH& S 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	**Range**
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: o Using of relevant protective clothing and equipment, o use of tooling and equipment, o workplace environment and safety handling of material, o use of fire fighting equipment, enterprise first aid, o hazard control and hazardous materials and substances. o Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc, o Following Occupational health and safety procedures designated for the task

	o Checking and fulfilling required safety devices before starting operation Apply safe operating procedures regarding: o electrical safety, o machinery movement and operation, o manual and mechanical lifting and shifting, o working in proximity to others and site visitors. Apply emergency procedures : o emergency shutdown and stopping of equipment, o using extinguishing fires, first aid application and site evacuation
Tools and Equipment	Electronics tool kit, mechanical toolkit, fixing and support devices, relevant measuring tools
Material	Include but not limited to: • 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

Evidence guide	**Descriptions**
Critical Aspects of Competence	Assessment requires evidence that the candidate: • 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 • Assist in commissioning process control systems as described in unit of scope and including: o Understanding the role of each commission team member o Connecting and setting-up commissioning testing/measuring devices in accordance with requirements for a particular control system and team instructions o Setting-up and adjusting process instruments and apparatus in accordance with process control requirements and equipment manufacturer instructions and team instructions. o Documenting adjustment settings in accordance with established procedures. o 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
Underpinning knowledge	Include but not limited to: • Process control, commissioning • Occupational Health and Safety principles • Instrumentation safe working practices
Underpinning skill	Include but not limited to: • Instrumentation safe working practices • Problem solving in unplanned events
Resource Implications	Include but not limited to: • 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: Industrial Automation & Control Technology Management Level V	
Unit Title	**Solve problems in process controllers, transmitters and converters**
Unit Code	**ELE IAC5 10 0511**
Unit Descriptor	This unit covers providing solutions to predictable problems in process controllers, transmitters and converters. It encompasses working safely, applying logical problem solving procedures, evaluating performance, the use of measuring devices, providing solutions to predictable control problems, and documenting solutions.

Element	Performance criteria
1. Prepare to find and rectify faults & work on process controllers, transmitters and converters	1.1 OH& S procedures for a given work area are identified, obtained and understood 1.2 OH& S risk control work preparation measures and procedures are followed 1.3 The nature of the control problem is obtained from documentation or from work supervisor to establish the scope of work to be undertaken. 1.4 Advice is sought from the work supervisor to ensure the work is coordinated effectively with others. 1.5 Sources of materials that may be required for the work are established in accordance with established procedures. 1.6 Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety
2. Solve process controller transmitters and converters problems	2.1 OH& S risk control work measures and procedures are followed. 2.2 The need to test or measure live is determined in strict accordance with OH& S requirements and when necessary conducted within established safety procedures 2.3 Process controller/transmitters/converters and control loops are checked as being isolated where necessary in strict accordance OH& S requirements and procedures 2.4 Known solutions that include the use of measured and calculated values are used for solving predictable process

	controller problems. 2.5 Written justification is made for solutions used to solve process controller problems. 2.6 Methods for dealing with unexpected situations are selected on the basis of safety and specified work outcomes. 2.7 Problems are solved without damage to apparatus, the surrounding environment or services and using sustainable energy principles.
3 Complete work and provide status report(s)	3.1 OH& S risk control work completion measures and procedures are followed. 3.2 Status report(s) is/are completed and work supervisor notified in accordance with established procedures

Variables	**Range**
Emergency procedures	include but not limited to: The isolation of electrical, mechanical, hydraulic, pneumatic and emergency steam and water equipment as appropriate.
Workplace procedures	include but not limited to: Standard Operating Procedures (SOPs), safety procedures, safety signs and symbols, labels, Material Safety Data Sheets (MSDSs), codes of practice, manufacturers' advice, standard forms and reports
Safe work procedures	Include but not limited to: relate to own work responsibilities and may include materials handling, working with hazardous goods, and special requirements such as working in confined spaces and at heights
Responsibility	Includes but not limited to: monitoring health and safety relates to the work area duties
Hazards	Include but not limited to: • noise • confined spaces • working with steam and hot services/product • airborne particulates • handling harmful substances • working with and near moving equipment/load

	shifting equipment • stress • broken or damaged equipment or materials • slip, trip and fall hazards • manual handling • working with 240V power supply • poor ventilation • working in exposed weather conditions • working with combustible materials
Work responsibilities	Include but not limited to: accountability for modeling appropriate OHS policies and procedures and may include formal or informal responsibility for providing a support role to others in the work area
Examples of OH& S procedures	include but not limited to: consultation and participation, emergency response, response to specific hazards, incident investigation, risk assessment, reporting arrangements and issue resolution procedures o working in exposed weather conditions o working with combustible materials
Occupational Health and safety(OHS)	Include but not limited to: • Wear uniforms, hazard protective, hand gloves • understand and Apply safe work procedures • Workplace hazards must be identified during course of work and should be reported to appropriate person • Means of contacting the appropriate personnel and *emergency services* in the event of an accident should be considered
Tools and Equipment	Electronics tool kit, mechanical toolkit, portable power tool like drilling machine, fixing and support devices, electrical workshop machines
Material	Include but not limited to: • Relevant organizational policy, guidelines, procedures and protocols • Occupational code of conduct • Occupational health and safety guidelines and manuals • Manufacturer's operation and service manuals • Catalogue

	• Posters, brushers, etc

Evidence Guide	Description
Critical aspects of Assessment	Assessment requires evidence that the candidate: • 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 • Manage risk in electro technology activities as described in unit of scope and including: o Identifying potential, perceived and actual risk/problem/fault events. o Using risk management methods, tools and techniques in analysis and reporting. o Incorporating risk management processes and procedures into program and project plans. o Monitoring and responding risk/problem/fault events effectively. o Identifying improvements and documenting recommendation for their inclusion in ongoing or future programs and projects. o 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.
Underpinning knowledge	Include but not limited to: • Enterprise communication methods • Enterprise work activities records • Fault finding techniques

	• Electrical control devices • Control circuit fundamentals • Technical standards regulations and codes for general electrical installations • Technical manuals and catalogues • Alternating current rotating machines • Single and three phase transformers • Lighting fundamentals • Luminaries and lighting systems • Electrical heating • Electrical installation wiring and accessories • Electrical installation protection methods and devices • Electrical installations, arrangement and equipment selection • Electromagnetic principles • Electronic components and systems, industrial applications • Occupational Health and Safety principles • Electrical Safe working practices
Underpinning skill	Include but not limited to: • Measurement circuits and applications • Instrumentation safe working practices • Problem solving in unplanned events
Resource Implications	Include but not limited to: • Workplace or fully equipped assessment or simulated location with necessary tools and equipment as well as consumable materials includes: o OHS policy, system and procedures o Advice on OHS-related personnel and nominated responsibilities o Standard operating procedures and related advice on specific safe work practices o Advice on hazards and control procedures relevant to work responsibilities o Work tasks and related equipment to which OHS procedures are to be applied o Personal protective clothing and equipment as required o Emergency and/or evacuation procedures for the potential range of hazards o Storage areas for hazardous goods as required o Reporting system and procedures

	• 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: Industrial Automation & Control Technology Management Level V	
Unit Title	**Find and rectify faults in process control systems**
Unit Code	**ELE IAC5 11 0511**
Unit Descriptor	This unit covers finding and rectifying faults in process control apparatus and systems. The unit encompasses safe working practices, interpreting process and circuit diagrams, applying knowledge of process controls to logical fault finding procedures, conducting repairs, safety and functional testing and completing the necessary service documentation.

Elements	Performance Criteria
1 Prepare to find and rectify faults in process control systems.	1.1 OH& S procedures for a given work area are identified, obtained and understood 1.2 OH& S risk control measures and procedures are followed in preparation for the work. 1.3 The nature of the fault is obtained from documentation or from work supervisor to establish the scope of work to be undertaken. 1.4 Advice is sought from the work supervisor to ensure the work is coordinated effectively with others. 1.5 Sources of materials that may be required for the work are established in accordance with established procedures. 1.6 Tools, equipment and testing devices needed to carry out the work are obtained in accordance with established procedures and checked for correct operation and safety
2 Find faults.	2.1 OH& S 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 OH& S requirements and when necessary conducted within established safety procedures 2.3 Apparatus is checked as being isolated where necessary in strict accordance OH& S requirements and procedures 2.4 Fault finding is approached methodically drawing on knowledge of industrial processes and control apparatus and systems using measured and calculated values of system parameters. 2.5 Apparatus components are dismantled where necessary and parts stored to protect them against loss or damage

	2.6 Faulty components are rechecked and their fault status confirmed. 2.7 Unexpected situations are dealt with safely and with the approval of an authorized person. 2.8 Fault finding activities are carried out without damage to apparatus, circuits, the surrounding environment or services and using sustainable energy principles.
3 .Rectify fault.	3.1 OH& S risk control measures and procedures for carrying out the work are followed. 3.2 Apparatus is checked as being isolated where necessary in strict accordance OH& S requirements and procedures 3.3 Materials required to rectify faults are sourced and obtained in accordance with established procedures. 3.4 Repairs are affected efficiently without damage to other components or apparatus and using sustainable energy principles. 3.5 Effectiveness of the repair is tested in accordance with established procedures. 3.6 Apparatus is reassembled, finally tested and prepared for return to customer
4 Completion and report fault finding and rectification activities	4.1 OH& S work completion risk control measures and procedures are followed. 4.2 Work area is cleaned and made safe in accordance with established procedures. 4.3 Written justification is made for repairs to apparatus. 4.4 Work completion is documented and appropriate person(s) notified in accordance with established procedures

Variables	**Range**
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: o Using of relevant protective clothing and equipment, o use of tooling and equipment, o workplace environment and safety handling of material, o Use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances. o Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc, o Following Occupational health and safety procedures

	designated for the task o Checking and fulfilling required safety devices before starting operation Apply safe operating procedures regarding: o electrical safety, o machinery movement and operation, o manual and mechanical lifting and shifting, o working in proximity to others and site visitors. Apply emergency procedures : o emergency shutdown and stopping of equipment, o using extinguishing fires, first aid application and site evacuation
Tools and Equipment	Electronics tool kit, mechanical toolkit, portable power tool like drilling machine, fixing and support devices, electrical workshop machines
Material	Include but not limited to: • 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

Evidence guide	**Descriptions**
Critical Aspects of Competence	Assessment requires evidence that 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 & workplace procedures • Find and rectify faults in process control systems as listed as described in unit of scope and including: o Using methodical fault finding techniques o Finding faults efficiently o Rectifying faults without damage o Providing written justification for the rectifications undertaken o 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
Underpinning knowledge	Include but not limited to: • Fault finding techniques • Process control principles • Process control systems • Occupational Health and Safety principles • Instrumentation safe working practices
underpinning skill	Include but not limited to: • Measurement circuits and applications • Instrumentation safe working practices • Problem solving in unplanned events
Resource Implications	Include but not limited to: • 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: Industrial Automation & Control Technology Management Level V	
Unit Title	**Plan control system projects**
Unit Code	**ELE IAC5 12 0511**
Unit Descriptor	This unit covers development and documentation of control project proposals, milestones and completions. The unit encompasses establishing budgets, critical path analysis, development of workflow strategies, documenting, presenting and negotiating budgets and timelines.

Elements	Performance Criteria
1 Establish the scope of the project	1.1 OH& S processes and procedures for a given work area are identified, obtained and understood 1.2 Project deliverables and budget are established from project planning and other relevant documentation and from discussions with appropriate person(s). 1.3 Measurable outcomes are identified to evaluate the project on completion from project planning and other relevant documentation. 1.4 Plant, materials and skills needed to meet project outcome are established from project planning and other relevant documentation. 1.5 Processes and procedures are developed for managing contract variations from discussions with appropriate person(s) and in accordance with contractual agreement.
2 Manage project.	2.1 OH& S policies, procedures and programs are implemented and monitored. 2.1 Achievement of project outcomes is delegated to appropriately competent persons involved in the project. 2.2 Risk events are identified and project plan strategies implemented to ensure that outcomes are achieved to the required standard of quality specified in the contract and safety required by organization policy. 2.3 Procurement processes and procedures are monitored to ensure on time supply of plant and materials and in accordance with organization policy. 2.4 Project is progress is monitored against schedule, quality requirements and budget. 2.5 Conflict issues at the work site and between stakeholders, clients and regulators are identified and managed in

	accordance with organization policy. 2.6 Variations are managed in accordance with agreed processes and in accordance with the contract. 2.7 Project records are maintained and progress reports written and forwarded to appropriate person(s).
3 Complete project	3.1 Project outcomes are reviewed against original plan, implemented risk strategies, contract variations, safety record and budget. 3.2 Project completion acceptance is sought from appropriate person(s) and handover documented in accordance with organization policy.

Variables	**Range**
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: o Using of relevant protective clothing and equipment, o use of tooling and equipment, workplace environment and safety handling of material, o use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances. o Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc, o Following Occupational health and safety procedures designated for the task o Checking and fulfilling required safety devices before starting operation Apply safe operating procedures regarding: o electrical safety, o machinery movement and operation, o manual and mechanical lifting and shifting, o Working in proximity to others and site visitors. Apply emergency procedures : o emergency shutdown and stopping of equipment, o using extinguishing fires, first aid application and site evacuation
Tools and Equipment	Computer, printer, charts, paper and planning software's
Material	Include but not limited to: • 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

Evidence guide	**Descriptions**
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Implement Occupational Health and Safety workplace o procedures and practices, including the use of risk control o measures as specified in the performance criteria and range o 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 • Manage control projects as described and including: o Establishing the scope of the project accurately, o Ascertaining the input a project o Developing effective management processes, o Managing resources and variations effectively o Resolving conflicts o Adopting risk management strategies o Maintaining records and submitting progress reports o Meeting project outcomes o 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
Underpinning knowledge	Include but not limited to: • Project management • Customer/Client relations • Control industry sector customs and practices • Occupational health and safety principles • Occupational Health and Safety, enterprise responsibilities
Underpinning Skills	Include but not limited to: • Interpret work instructions • Interpret and define work procedures • Selection and use of proper tools & equipment • Installation skills • Problem solving in unplanned events • Instrumentation safe working practices
Resource Implications	Include but not limited to: • 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	Include but not limited to: • 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: Industrial Automation & Control Technology Management Level V	
Unit of Competency Title	**Manage control projects**
Unit Code	**ELE IAC5 13 0511**
Unit Descriptor	This unit covers the management of control projects involving design, modifications, installation, and/or maintenance of systems and equipment. The unit encompasses covers management of safety, budget variation, personnel, resources, critical path timelines and completion of documentation.

Elements	Performance Criteria
1 Establish the scope of the project	1.1 OH& S processes and procedures for a given work area are identified, obtained and understood 1.2 Project deliverables and budget are established from project planning and other relevant documentation and from discussions with appropriate person(s). 1.3 Measurable outcomes are identified to evaluate the project on completion from project planning and other relevant documentation. 1.4 Plant, materials and skills needed to meet project outcome are established from project planning and other relevant documentation. 1.5 Processes and procedures are developed for managing contract variations from discussions with appropriate person(s) and in accordance with contractual agreement.
2 Manage project.	2.1 OH& S policies, procedures and programs are implemented and monitored. 2.2 Achievement of project outcomes is delegated to appropriately competent persons involved in the project. 2.3 Risk events are identified and project plan strategies implemented to ensure that outcomes are achieved to the required standard of quality specified in the contract and safety required by organization policy. 2.4 Procurement processes and procedures are monitored to ensure on time supply of plant and materials and in accordance with organization policy. 2.5 Project is progress is monitored against schedule, quality requirements and budget.

	2.6 Conflict issues at the work site and between stakeholders, clients and regulators are identified and managed in accordance with organization policy. 2.7 Variations are managed in accordance with agreed processes and in accordance with the contract. 2.8 Project records are maintained and progress reports written and forwarded to appropriate person(s).
3 Complete project	3.1 Project outcomes are reviewed against original plan, implemented risk strategies, contract variations, safety record and budget. 3.2 Project completion acceptance is sought from appropriate person(s) and handover documented in accordance with organization policy.

Variables	**Range**
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: o Using of relevant protective clothing and equipment, o use of tooling and equipment, workplace environment and safety handling of material, o use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances. o Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc, o Following Occupational health and safety procedures designated for the task o Checking and fulfilling required safety devices before starting operation Apply safe operating procedures regarding: o electrical safety, o machinery movement and operation, o manual and mechanical lifting and shifting, o Working in proximity to others and site visitors. Apply emergency procedures : o emergency shutdown and stopping of equipment, o using extinguishing fires, first aid application and site evacuation
Tools and Equipment	Computer, paper, printer, charts and management softwares

Material	Include but not limited to: • 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

Evidence guide	**Descriptions**
Critical Aspects of Competence	Assessment requires evidence that the candidate: • 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 • Manage control projects as described and including: o Establishing the scope of the project accurately, o Ascertaining the input a project o Developing effective management processes, o Managing resources and variations effectively o Resolving conflicts o Adopting risk management strategies o Maintaining records and submitting progress reports o Meeting project outcomes o 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
Underpinning knowledge	Include but not limited to: • Occupational health and safety principles • Occupational Health and Safety, enterprise responsibilities
Underpinning skill	Include but not limited to: • Project management • Customer/Client relations • Control industry sector customs and practices
Resource Implications	Include but not limited to: • 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: Industrial Automation & Control Technology Management Level V	
Unit Title	**Compile and produce an Electro technology report**
Unit Code	**ELE IAC5 14 0511**
Unit Descriptor	This unit covers complying and producing an electro technology report. It encompasses determining the safety requirements are met and all regulatory responsibilities are adhered to. The person competent in this unit must demonstrate an ability to identify information sources and collect and analyze and format information applicable to the electro technology industry and produce a report as required.

Element	Performance criteria
1 Prepare to develop a report	1.1 OH& S processes and procedures for a given work area are identified, obtained and understood. 1.2 Established techniques for report writing are reviewed are adopted in accordance with organization policies. 1.3 The scope of the report is evaluated and report parameters established using a formal evaluation/survey processes. 1.4 Criteria from other related works impacting on the report are determined from other sources. 1.5 Identify source and availability of information
2. Develop report.	2.1 Report is developed to include scenarios/requirements established in consultation with appropriate person(s), and regulatory requirements. 2.2 Report is developed in collaboration with all relevant personnel. 2.3 Competent persons are identified to assist in the compilation of the report. 2.4 Report is reviewed against all inputs and adjusted to rectify any anomalies. 2.5 Compile report in accordance with organization policies and procedures. 2.6 Compile and analyze research report information
3 Obtain approval for final report	3.1 Report is presented and discussed with person(s) of higher authority. 3.2 Alterations to the report resulting from the presentation/discussion are negotiated with person(s) of higher authority within the constraints of organization policy. 3.3 Final report is presented and approval obtained from

	appropriate person(s).

Variables	Range
Occupational Health and safety(OH& S)	Apply OH& S requirements in accordance with regulations/codes of practice and enterprise safety policies and procedures. This may include: o Using of relevant protective clothing and equipment, o use of tooling and equipment, workplace environment and safety handling of material, o use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances. o Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc, o Following Occupational health and safety procedures designated for the task o Checking and fulfilling required safety devices before starting operation Apply safe operating procedures regarding: o electrical safety, o machinery movement and operation, o manual and mechanical lifting and shifting, o working in proximity to others and site visitors. Apply emergency procedures : o emergency shutdown and stopping of equipment, o using extinguishing fires, first aid application and site evacuation
Tools and Equipment	Computer, printer and auxiliary equipments
Material	Include but not limited to: • 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

Evidence Guide	Description
Critical aspects of Assessment	Assessment requires evidence that the candidate: • 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 • Compile and produce an electro technology report as described in unit scope and including: o Typical organisation policies and procedures. o Access to a report brief to established report parameters. o Access to appropriate person(s) to establish report requirements. o Establishing the scope and parameters of the report. o Determining the impact of other related works. o Developing design brief incorporating scenarios and all requirements. o Appropriate computer application. o Identifying competencies required for the report. o Documenting report proposal. o Negotiating alterations to the proposed report successfully.
Underpinning knowledge	Include but not limited to: • Enterprise communication methods • Research concepts • Occupational Health and Safety, enterprise responsibilities
Underpinning skill	Include but not limited to: • Enterprise work activities records • Computer use basics • Engineering analysis, decision making and reporting • Working in a team • Data collection techniques • Data analysis and presentation • Occupational Health and Safety, enterprise responsibilities
Resource Implications	Include but not limited to:

	• 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: Industrial Automation & Control Technology Management Level V	
Unit Title	**Manage risk in electro technology activities**
Unit Code	**ELE IAC5 15 0511**
Unit Descriptor	This unit covers managing risk related to OH& S, 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.

Element	Performance criteria
1 .Identify risks and develop management strategies	1.1 OH& S 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 analysed, in consultation with risk professionals and appropriate other person(s) in accordance with organisation 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 OH& S risk control measure are incorporated in the in the in the risk management strategies in compliance with organization's OH& S 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 management strategies.	3.1 Project outcomes are reviewed wit appropriate person(s) to 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.

Variables	**Range**
Occupational Health and safety(OH& S)	Apply OH& S requirements in accordance with regulations/codes of practice and enterprise safety policies and procedures. This may include: o Using of relevant protective clothing and equipment, o Use of tooling and equipment, workplace environment and safety handling of material, o Use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances. o Using Chemical prove gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc, o Following Occupational health and safety procedures designated for the task o Checking and fulfilling required safety devices before starting operation Apply safe operating procedures regarding: o electrical safety, o machinery movement and operation, o manual and mechanical lifting and shifting, o Working in proximity to others and site visitors. Apply emergency procedures : o emergency shutdown and stopping of equipment, o using extinguishing fires, first aid application and site evacuation
Tools and Equipment	Computer, printer and auxiliary equipments
Material	Include but not limited to: • 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

Evidence Guide	Description
Critical aspects of Assessment	Assessment requires evidence that the candidate: • 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 • Manage risk in electro technology activities as described in unit of scope and including: o Identifying potential, perceived and actual risk events. o Using risk management methods, tools and techniques in analysis and reporting. o Incorporating risk management processes and procedures into program and project plans. o Monitoring and responding risk events effectively. o Identifying improvements and documenting recommendation for their inclusion in ongoing or future programs and projects. o 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.
Underpinning knowledge	Include but not limited to: • Risk management, application and techniques • Occupational Health and Safety, enterprise responsibilities
Underpinning skill	Include but not limited to: • Risk management, application and technique

	• Work with team • Communication • Leadership quality
Resource Implications	Include but not limited to: • 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: Industrial Automation & Control Technology Management Level V	
Unit Title	**Facilitate and Capitalize on Change and Innovation**
Unit Code	**EEL EET5 16 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: Industrial Automation & Control Technology Management Level V	
Unit Title	**Practice Career Professionalism**
Unit Code	**EEL EET5 17 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: Industrial Automation & Control Technology Management Level V	
Unit Title	**Establish and Conduct Business Relationships**
Unit Code	**EEL IAC5 18 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 maintain business relationships	4.1 Pro-actively seek, review and act upon information needed to 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 behavior

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

Occupational Standard: Industrial Automation & Control Technology Management Level V	
Unit Title	**Develop and Refine Systems for Continuous Improvement in Operations**
Unit Code	**EEL IAC5 19 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	3.1 Check that levels of delegated authority and responsibility are appropriate for continuous improvement from the shop

practice	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 systems	Organization systems may include: • 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 improvements	Systems which impact/are impacted on improvements and the improvement system include: • office

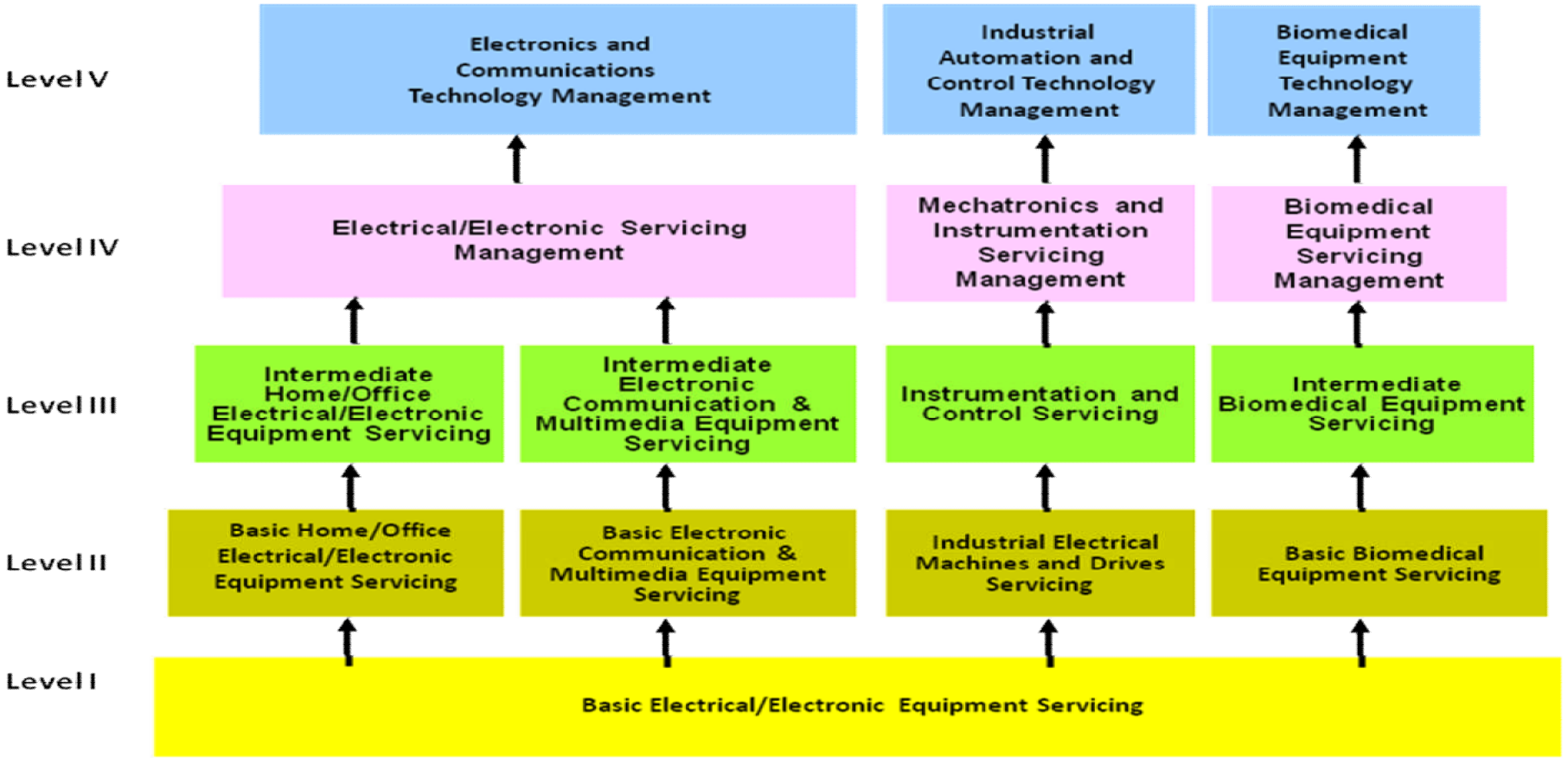
	• purchasing • rewards (individual or team at all levels) • sales • marketing • maintenance • process/product • transport and logistics
Organizational knowledge	Organizational knowledge should: • be able to be quantified or otherwise modified to make its outcomes measurable or observable • be able to 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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