Federal Democratic Republic of Ethiopia OCCUPATIONAL STANDARD



POWER TRANSMISSION SYSTEMS INSTALLATION AND MAINTENANCE



NTQF Level III and IV



Ministry of Education June 2012

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

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

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

- chart with an overview of all Units of Competence for the respective level (Unit of Competence Chart) 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

| Copyright Copyright Ethiopia Occupational Standard June 201 | Page 1 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|---|---------------|------------------------------------|--|------------------------|
|---|---------------|------------------------------------|--|------------------------|

UNIT OF COMPETENCE CHART

| Occupational Standard: Power Transmission Systems Installation and Maintenance | | | | | |
|---|--|--|--|--|--|
| Occupational Code: EIS 1 | Occupational Code: EIS TIM | | | | |
| NTQF Level III | | | | | |
| EIS TIM3 01 0612 Use Drawings, Diagrams, Schedules and Manuals | EIS TIM3 02 0612 Operate Plant and Equipment near Live Electrical conductors/apparatus | EIS TIM3 03 0612 Dismantle, Assemble and Fabricate Electro Technology Components | | | |
| EIS TIM3 04 0612 Implement and Monitor the Organizational OHS Polices Procedures and Programs | EIS TIM3 05 0612 Inspect Overhead Structures and Electrical Apparatus/Tower | EIS TIM3 06 0612 Develop HV Switching Schedule | | | |
| EIS TIM3 07 0612 Coordinate Permit Procedures | EIS TIM3 08 0612 Contribute to Coordinated HV Live Line Work | EIS TIM3 09 0612 Maintain Energized Lines (Transmission) Using Live Line Stick Technique | | | |
| EIS TIM3 10 0612 Maintain Energized Lines (Transmission) Using Bare Hand Technique | EIS TIM3 11 0612 Maintain Bare Hand Technique on a Helicopter Platform | EIS TIM3 12 0612 Monitor Implementation of Work Plan / Activities | | | |
| EIS TIM3 13 0612 Apply Quality Control | EIS TIM3 14 0612 Lead Workplace Communication | EIS TIM3 15 0612 Lead Small Teams | | | |
| EIS TIM3 16 0612 Improve Business Practice | | | | | |
| | | | | | |

| Page 2 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|---------------|------------------------------------|--|------------------------|
|---------------|------------------------------------|--|------------------------|

| NTQF Level IV | | |
|---|---|---|
| EIS TIM4 01 0612 Apply Environment and Sustainable Energy Procedures | EIS TIM4 02 0612 Operate Plant and Equipment near Live Electrical Conductors/ Apparatus | EIS TIM4 03 0612 Work Safely near Live Electrical Apparatus as Non-Electrical Worker |
| EIS TIM4 04 0612 Implement and Monitor Organizational OHS Policies, Procedures and Programs | EIS TIM4 05 0612 Maintain HV Power System Circuit Breakers | EIS TIM4 06 0612 Assemble, Set-Up and Test Personnel Computers |
| EIS TIM4 07 0612 Terminate and Connect Components, Cables Wiring and Conductors for Electronic Circuits | EIS TIM4 08 0612 Investigate Quality of Supply Issues | EIS TIM4 09 0612 Maintain Voltage Regulating Equipment (Capacitor Banks) |
| EIS TIM4 10 0612 Install HV Plant and Equipment | EIS TIM4 11 0612 Analyze and Appraise Fault and Outage Data | EIS TIM4 12 0612 Draft and Layout Overhead and Ground Transmission Extension |
| EIS TIM4 13 0612 Contribute to Coordinated HV Live Line Work | EIS TIM4 14 0612 Maintain Distribution Field Devices | EIS TIM4 15 0612 Commission Distribution Field Devices |
| EIS TIM4 16 0612 Respond to Technical Enquiries and Requests | EIS TIM4 17 0612 Organize and Implement Line and Easement Surveys | EIS TIM4 18 0612 Plan and Organize Work |
| EIS TIM4 19 0612 Migrate to New Technology | EIS TIM4 20 0612 Establish Quality Standards | EIS TIM4 21 0612 Develop Individuals and Team |
| EIS TIM4 22 0612 Utilized Specialized Communication Skills | EIS TIM4 23 0612 Manage and Maintain Small/Medium Business Operation | |

| Page 3 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|---------------|------------------------------------|--|------------------------|
|---------------|------------------------------------|--|------------------------|

NTQF Level III

| Page 4 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|---------------|------------------------------------|--|------------------------|
|---------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level III | | |
|---|---|--|
| Unit Title | Use Drawings, Diagrams, Schedules and Manuals | |
| Unit Code | EIS TIM3 01 0612 | |
| Unit Descriptor | This unit covers the use of drawings, diagrams, equipment and cable schedules and manuals as they apply to the various electro technology work functions. It encompasses the rudiments for communicating with schematic, wiring and mechanical diagrams and equipment and cable/connection schedules, manuals, site and architectural drawings and plans showing the location of services, apparatus, plant and machinery. | |

E.

| Elements | Performance Criteria | |
|---|--|--|
| 1. Prepare to use drawings, | 1.1 Established OHS risk control measures and procedures are followed. | |
| diagrams, schedules and manuals | 1.2 The need for drawings, diagrams, schedules or manual is determined from the nature of the <i>work</i> to be undertaken. | |
| and manuals | 1.3 Established routines and procedures are followed to obtain drawings, diagrams, schedules or manuals required for the work to be undertaken. | |
| 2. Use drawings, | 2.1 Drawings, diagrams, schedules and/or manuals are selected, appropriate to the work being undertaken. | |
| diagrams, schedules and manuals to obtain job information | 2.2 Drawings, diagrams and schedules are interpreted using knowledge of drawing layouts, conventions and symbols. | |
| | 2.3 Dimensions are extracted from drawings and diagrams for application to work undertaken. | |
| | 2.4 Location of equipment is determined from equipment schedules and location diagrams. | |
| | 2.5 Manuals are reviewed to ascertain their format and where information relevant to the work to be undertaken is located. | |
| | 2.6 Information given in manuals is interpreted in relation to the work to be undertaken. | |
| 3. Use drawings, diagrams, schedules and manuals to convey information and ideas | 3.1 Drawing conventions are used in neat freehand drawings to convey information and ideas to others involved in the work to be undertaken. | |
| | 3.2 Drawing conventions are used to neatly correct freehand original job drawing to show final 'as installed' arrangement. | |
| | 3.3 Corrected drawings are forwarded to appropriate person(s) in accordance with established procedures. | |
| Page 5 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | |

| Variable | Range |
|------------------|-------------------------------------|
| This competence | Appliances |
| standard unit | Business equipment |
| shall be | Computers |
| demonstrated in | Data Communications |
| relation to | Electrical |
| assembly, | Electrical Machines |
| installation, | Electronics |
| fault finding, | Fire protection |
| maintenance or | Instrumentation |
| development work | Refrigeration and Air Conditioning |
| of the following | Renewable / sustainable energy, and |
| disciplines: | Security technology |

| Evidence Guide | |
|--------------------------|---|
| Critical Aspects | Evidence that shows a candidate is able to: |
| of Competence | Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures |
| | Apply sustainable energy principles and practices |
| | Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures |
| Underpinning | Demonstrates knowledge of: |
| Knowledge and Attitudes | safe working practices and using drawings, diagrams, schedules and manuals |
| Underpinning Skills | Demonstrates skills to: |
| | Drawings and diagrams |
| | Occupational Health and Safety principles |
| | safe working practices and applying OHS practices |
| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. |
| Methods of | Competence may be assessed through: |
| Assessment | Interview / Written Test |
| | Observation / Demonstration with Oral Questioning |
| Context of Assessment | Competence may be assessed in the work place or in a simulated work place setting. |

| Page 6 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|---------------|------------------------------------|--|------------------------|
|---------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level III | | |
|---|---|--|
| Unit Title | Operate Plant and Equipment Near Live Electrical Conductors/Apparatus | |
| Unit Code | EIS TIM3 02 0612 | |
| Unit Descriptor | This unit covers the safe operation and maintenance of plant and equipment near live electrical conductors and/or apparatus. It encompasses plant and equipment relevant to the enterprise and is in addition to any local government legislation and or regulatory requirements regarding the operation of that plant and or equipment. It includes the conducting of operational checks, the correct positioning of road signs, barriers and or warning devices. It also encompasses the completion of log books and job completion documentation. | |

| Elements Performance Criteria | | | | |
|--|------------------------------------|---|--|--|
| 1. Prepare to operate plant and equipment near energized and exposed electrical conductors/ apparatus | 1.1 nt d | Works sch requiremen are receive site inspec | edule(s), including drawings, plans nts, established procedures, and m ed, analyzed and confirmed, if nece tion. | , aterial lists, essary, by |
| | 1.2 | Relevant re the operati and expos communica sites. | equirements and established proce ion of <i>plant and equipment</i> near e ed electrical conductors/apparatus ated to all personnel and identified | edures for energized are for all work |
| | 1.3 | OHS polici and establ and equipr conductors the purpos communic | ies and procedures related to requi ished procedures for the operation ment near energized and exposed s/apparatus are obtained and confi ses of the work to be performed and ated. | rements of plant electrical rmed for d |
| | 1.4 1.5 | Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures. | | |
| | | Hazards a measures including e establishee | re identified; OHS risks assessed a are prioritized, implemented and m emergency exits kept clear accordir d procedures. | and control conitored ng to |
| | 1.6 | Relevant work permits are obtained to access and perform work according to requirements and/or established procedures. | | |
| | 1.7 | Resources personal p | including personnel, equipment, to rotective equipment required for th | ools and e job are |
| Page 7 of 165 | Ministry of Education Copyright | | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |

| | | | obtained a | and confirmed in working order. | |
|---|--|--|---|---|--------------------------------------|
| | | 1.8 | Relevant p first aid, po procedure | personnel at worksite are confirmed ole top rescue and other related wo s according to requirements. | l current in rk |
| | | 1.9 | Liaison an personnel resolved to | d communication issues with other, , authorities, clients and land owner o carry out work where necessary. | /authorized s are |
| | | 1.10 | Site is pre minimize r individuals | pared according to the work schedu isk and damage to property, comm in accordance with established pro | ule and to erce, and ocedures. |
| | | 1.11 | Personnel operators respective accordanc | participating in the work, including and contractors, are fully briefed ar responsibilities confirmed where a e with established procedures. | plant nd pplicable in |
| | | 1.12 | Road sign in accorda | s, barriers and warning devices are ince with requirements. | positioned |
| 2. Carry ou operation plant an equipme | ut the on of d ent | 2.1 | OHS and a reduce the are monitor requireme | sustainable energy principles and p incidents of accidents and minimiz ored and followed in accordance with nts and/or established procedures. | practices to ze waste th |
| near en and exp electrica conduct | near energized and exposed electrical conductors/ | ed 2.2 | Lifting, clir and use of practices a requireme | nbing, working in confined spaces a f power tools/equipment, technique are safely followed and, currency ac nts confirmed. | and aloft, s and ccording to |
| apparatus | 2.3 | Apply esse safe opera and expose completion standards requireme | ential knowledge and associated skation of plant and equipment near e ed electrical conductors/apparatus in an agreed timeframe and, to qu with a minimum of waste according nts. | tills in the nergized to ensure ality g to | |
| | 2.4 | Plant and and expos to requirer | equipment are safely operated nea ed electrical conductors/apparatus nents and established procedures. | r energized according | |
| | 2.5 | Hazard warnings and safety signs are recognized and hazards and assessed OHS risks are reported to the immediate authorized persons for directions according to established procedures. | | | |
| | 2.6 | Unplanned equipment conductors of establis | d events in the operation of plant ar t near energized and exposed elect s/apparatus are undertaken within t hed procedures. | nd rrical he scope | |
| | | 2.7 | Known sol using acqu Skills. | lutions to a variety of problems are uired Essential Knowledge and Ass | applied ociated |
| Page 8 of 1 | 65 | Ministry o Cop | of Education oyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |

| | | 2.8 | On-going checks of quality of the work are undertaken in accordance with instructions and established procedures. |
|--|--|--|--|
| 3. | 3. Complete the operation of plant and | 3.1 | Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures. |
| equipment near energized and exposed | 3.2 | Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable. | |
| | apparatus | 3.3 | Work site is rehabilitated, cleaned up and made safe in accordance with established procedures. |
| | | 3.4 | Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures. |
| | | 3.5 | Relevant work permit(s) are signed off and, plant and equipment are checked, returned to service/stored appropriately, in accordance with requirements and established procedures. |
| | | 3.6 | Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified. |

| Variable | Range |
|--|--|
| Plant and equipment near live electrical conductors and/or apparatus | • Support plant may include elevating work platform, back hoes, earth drilling rigs, trench excavators, heavy vehicles, concrete cutters, compressors, portable generators, welders, crimper-cutters, pumps, chain-saws, jack-hammers, post hole diggers, sand-blasters, drills and self-loading vehicle. |
| | Equipment may include hand operated ratchet and friction grip winches, chain pullers and block and tackle. |

| Evidence Guide | |
|-----------------------------------|--|
| Critical Aspects of Competence | Evidence that shows a candidate is able to: implement occupational health and safety workplace procedures and practices including the use of risk control measures apply sustainable energy principles and practices conduct work observing the relevant legislation, regulations, polices and workplace procedures |

| Underpinning Knowledge and Attitudes | Demonstrates knowledge of: Basic electrical principles Magnetism Electromagnetic principles Electro technology science and materials Engineering applications of mathematical principles Engineering applications of mechanical principles Engineering applications of material properties Elevator work platform operational principles Chain saw principles Environmental fundamentals Material handling and the environment Enterprise specific - policy and procedure Instructions Enterprise specific - technical drawings and documents |
|--|--|
| Underpinning Skills | Demonstrates skills to: safe working practices and applying OHS practices hand and power tools occupational health and safety principles electrical safe working practice hydraulic and pneumatic portable equipment enterprise vehicles generation power systems |
| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. |
| Methods of Assessment | Competence may be assessed through: Interview / Written Test Observation / Demonstration with Oral Questioning |
| Context of Assessment | Competence may be assessed in the work place or in a simulated work place setting. |

| Page 10 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level III | | | |
|---|---|--|--|
| Unit Title | Dismantle, Assemble and Fabricate Electro-Technology Components | | |
| Unit Code | EIS TIM3 03 0612 | | |
| Unit Descriptor | This unit covers basic fitting and fabrication techniques as they apply in the various electro technology work functions. It encompasses the safe use of hand and fixed and portable power tools, cutting, shaping joining and fixing using metallic and non-metallic materials, dismantling and assembling equipment, basic mechanical measurement and marking-out and reading diagrams. | | |

| Elements | Per | Performance Criteria | | |
|--|------------------|---|--|--|
| 1. Prepare for dismantling, assembling and | 1.1 | OHS procedures for a given work area are obtained and understood through <i>established routines and procedures</i> . | | |
| fabrication work | ⁽ 1.2 | Established OHS risk control measures and procedures in preparation for the work are followed. | | |
| | 1.3 | Safety hazard not previously identified are reported and advice on risk control measures are sought from the work supervisor. | | |
| | 1.4 | The nature of the work is obtained from documentation and from work supervisor to establish the scope of work to be undertaken. | | |
| | 1.5 | Advice is sought from the work supervisor to ensure the work is coordinated effectively with others. | | |
| | 1.6 | Materials required for the work are obtained in accordance with established routines and procedures. | | |
| | 1.7 | Tools, equipment and measuring devices needed to carry out the work are obtained and checked for correct operation and safety. | | |
| | 1.8 | Cutting tools such as drills and chisels are sharpened to suit the material on which they are to be used. | | |
| 2. Dismantle and assemble | 2.1 | Established OHS risk control measures and procedures for carrying out the work are followed. | | |
| electro- technology apparatus | 2.2 | Circuits/machines/plant is checked as being isolated where necessary in strict accordance OHS requirements and procedures. | | |
| | 2.3 | Appropriate tools are selected and used correctly and safely in dismantling and assembling apparatus. | | |
| | 2.4 | Apparatus manufacturer's dismantling and assembling | | |
| Page 11 of 165 | Vinistry Co | of Education pyright Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard June 2012 | | |

| | | guides are used where applicable. |
|------------------------------|-----|--|
| | 2.5 | Components are marked or tagged during the dismantling to help ensure correct and efficient reassembly. |
| | 2.6 | Dismantled components and parts are stored to protect them against loss or damage. |
| | 2.7 | Apparatus is dismantled and assembled efficiently without unnecessary waste of materials and energy and unnecessary damage to apparatus, and the surrounding environment or services. |
| | 2.8 | Procedures for referring non-routine events to immediate supervisor for directions are followed. |
| | 2.9 | Routine quality checks are carried out in accordance with work instructions. |
| 3. Fabricate electro- | 3.1 | Established OHS risk control measures and procedures for carrying out the work are followed. |
| technology components | 3.2 | Circuits/machines/plant is checked as being isolated where necessary in strict accordance OHS requirements and procedures. |
| | 3.3 | Appropriate tools are selected and used correctly and safely in fabricating components. |
| | 3.4 | Drawings and instruction for the fabrication of components are followed. |
| | 3.5 | Component dimensions are determined directly or by calculation from information given in job drawings and instructions. |
| | 3.6 | Components are fabricated efficiently without unnecessary waste of materials and energy and unnecessary damage to the surrounding environment or services. |
| | 3.7 | Procedures for referring non-routine events to immediate supervisor for directions are followed. |
| | 3.8 | Routine quality checks are carried out in accordance with work instructions. |
| 4. Complete work and report. | 4.1 | OHS risk control work completion measures and procedures are followed. |
| | 4.2 | Work site is cleaned and made safe in accordance with established procedures. |
| | 4.3 | Work supervisor is notified of the completion of the work in accordance with established procedures. |

| Page 12 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| Variable | Range |
|--|--|
| Installation, fault finding, maintenance or development work functions in any of the following disciplines: | Appliances Business equipment Computers Data Communications Electrical Electrical Machines Electronics Fire protection Instrumentation Refrigeration and Air Conditioning Renewable / sustainable energy, and Security technology |

п

| Evidence Guide | | | |
|--|--|--|--|
| Critical Aspects of Competence | Evidence that shows a candidate is able to: Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures | | |
| | Apply sustainable energy principles and practices | | |
| | Conduct work observing the relevant legislation, regulations, polices and workplace procedures | | |
| | Demonstrated consistent performance across a representative range of contexts from the prescribed items below: | | |
| | dismantle, assemble and fabricate electro technology components including: | | |
| | dismantle and assemble an apparatus relevant to the discipline in which competence is sought and that requires selection and safe use of variety dismantling/assembling tools. | | |
| | sharpening a drill bit for at least two different types of material | | |
| | fabricating a component that requires the selection and safe use of a variety of fabrication tools | | |
| | dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions | | |
| Underpinning Knowledge and Attitudes | Demonstrates knowledge of: | | |
| | Safe working practices and dismantling, assembling and fabricating electro technology components. | | |
| | Occupational Health and Safety principles | | |

| Page 13 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| Underpinning Skills | Demonstrates skills to: |
|--------------------------|---|
| | Safe working practices and applying OHS practices |
| | Safe working practices and dismantling, assembling and fabricating electro technology components. |
| | Hand tools |
| | Power tools |
| | Dismantling and assembling techniques |
| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. |
| Methods of | Competence may be assessed through: |
| Assessment | Interview / Written Test |
| | Observation / Demonstration with Oral Questioning |
| Context of Assessment | Competence may be assessed in the work place or in a simulated work place setting. |

| Page 14 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level III | | |
|---|--|--|
| Unit Title | Implement and Monitor the Organizational OHS Policies, Procedures and Programs | |
| Unit Code | EIS TIM3 04 0612 | |
| Unit Descriptor | This unit covers the implementation and monitoring of the participative arrangements for the management of the organizational OHS polices procedures, programs and issues, including disseminating information on hazards and risk assessment to meet OHS standards. It also encompasses the collation of work group input, as well as implementation of enterprise procedures for resolving OHS issues. | |

| Elements | Perfo | Performance Criteria | | |
|---|-------------------|---|--|--|
| 1. Prepare/plan to implement and monitor the organizational OHS policies, | 0 1.1 | Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed if necessary, by site inspection and the extent of the preparation of the work determined for planning and coordination. | | |
| procedures and programs | 1.2 | Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites. | | |
| | 1.3 | <i>Hazards</i> are identified, <i>OHS</i> risks assessed and control measures are prioritized , implemented and monitored including emergency exits kept clear, to ensure safe systems of work are followed and according to established <i>procedures.</i> | | |
| | 1.4 | <i>Work</i> is prioritized and sequenced for the most efficient and effective outcome following consultation with others for completion within acceptable timeframes, to a quality standard and in accordance with established procedures. | | |
| | 1.5 | Risk control measures are identified, prioritized, implemented and evaluated against the work schedule. | | |
| | 1.6 | Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures. | | |
| | 1.7 | Resources including personnel, equipment, tools and personal protective equipment required for the job are identified, scheduled and coordinated and confirmed in a safe and technical working order. | | |
| | 1.8 | Clients/Customers are provided with alternative methods within the scope, acceptable cost and requirements. | | |
| Page 15 of 165 | Ministry o Cop | Education right Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard June 2012 | | |

| | 1.9 | Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work. |
|--|------|---|
| | 1.10 | Site is prepared according to the work schedule and to minimize OHS risk, damage to property, commerce, and individuals in accordance with established procedures. |
| | 1.11 | Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities authorised and coordinated where applicable in accordance with established procedures. |
| | 1.12 | Positioning of road signs, barriers and warning devices is planned in accordance with traffic control management requirements and established procedures. |
| 2. Carry out the implementation and monitoring of the | 2. 1 | OHS and Sustainable Energy principles and practices to reduce the incidents of accidents and minimize waste are implemented and monitored in accordance with requirements and/or established procedures. |
| organizational OHS policies, procedures and | 2.2 | First Aid, Pole Top Rescue and other related work procedures are performed according to requirements and/or established procedures. |
| programs | 2.3 | Lifting, climbing, working in confined spaces, working at heights, and use of power tools/equipment, techniques and practices are safely exercised according to requirements. |
| | 2.4 | Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are risk control measures are implemented, preventative action taken and monitored and/or appropriate authorities consulted, where necessary, in accordance with requirements and established procedures. |
| | 2.5 | Remedial actions are taken to overcome any shortfalls encountered in the work schedule according to requirements and/or established procedures. |
| | 2.6 | Implementation and monitoring of the participative arrangements for the systematic management of organizational OHS policy procedures, programs and issues are carried out, in accordance with the work schedule and requirements and/or established procedures. |
| | 2.7 | Essential Knowledge and Associated Skills in the safe |

| Page 16 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| | | implementation and monitoring of the participative arrangements for the management of organizational OHS policy procedures, programs and issues is applied to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements. |
|---|-----|--|
| | 2.8 | Solutions to non-routine problems are identified and acted using acquired Essential Knowledge and Associated Skills according to requirements. |
| | 2.9 | On-going checks of quality of the work are undertaken in accordance with requirements and established procedures to ensure a quality outcome is achieved for the client/customer and to a community/industry standard. |
| 3. Complete the implementation and monitoring of the | 3.1 | Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance withestablished procedures. |
| organizational OHS policies, | 3.2 | Accidents, incidents and/or injuries are reported in accordance with requirements/established procedures. |
| programs | 3.3 | Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures. |
| | 3.4 | Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures. |
| | 3.5 | Relevant work permit(s) are signed off and, the work completed/returned to service and advised to client/customer in accordance with requirements. |
| | 3.6 | Works completion records, reports, as installed /modified drawing(s) and/or documentation and information are confirmed, processed and appropriate personnel notified. |

| Variable | Range | | |
|---|---|--|--|
| All relevant OHS legislation particularly include: | general duty of care requirements for maintenance and confidentiality of records of occupational injury and disease provision of information and training regulations and codes of practice relating to hazards present in work area health and safety representatives and OHS committees issue resolution | | |
| Hazardous events • accidents, fire and emergencies such as chemical | | | |
| Page 17 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | | |

| include: | bomb scares |
|--|---|
| Procedures for dealing with hazardous events include: | evacuation, chemical containment and first aid procedures |
| Workplace procedures include: | risk assessment and management; inspection housekeeping; participative arrangements, either general or specific to OHS training and assessment specific hazard policies and procedures OHS information OHS record keeping maintenance of plant and equipment purchasing of supplies and equipment and counselling/disciplinary processes |

| Evidence Guide | |
|--|--|
| 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 Apply sustainable energy principles and practices |
| Underpinning Knowledge and Attitudes | Demonstrates knowledge of: implementing and monitoring the organizational OHS policies, procedures and programs Enterprise specific - policies and procedure instructions Enterprise specific - OHS instructions Enterprise specific - technical drawings and documents |
| Underpinning Skills | Demonstrates skills of: Power line safety - implementation and monitoring Power line safety practices Power line installation safety |
| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. Moreover, access to: a range of emergencies and hazardous events (may be gathered through simulations), document on current OHS Acts, regulations and enterprise OHS policies and procedures personal protective equipment (PPE) |
| Methods of Assessment | Competence may be assessed through: Interview / Written Test Observation / Demonstration with Oral Questioning |
| Context of Assessment | Competence may be assessed in the work place or in a simulated work place setting. |

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level III | |
|---|--|
| Unit Title | Inspect Overhead Structures and Electrical Apparatus/ Tower |
| Unit Code | EIS TIM3 05 0612 |
| Unit Descriptor | This unit covers the inspection as per requirements of overhead structures such as towers and electrical apparatus. Overhead structures include towers and overhead conductors and or cables include, underground and overhead transition points, electrical equipment, hardware and or earthing systems. It also includes the completion of inspection reports and other relevant documentation in accordance with requirements. |

| Elements | Performance Criteria | | |
|---|---|---|--|
| Prepare for the inspection of overhead structures and | .1 Works schedule(s), including drawings, plans, requirements, established procedures, and mat are received, analyzed and confirmed, if necess site inspection. | erial lists, sary, by | |
| electrical apparatus used on towers | .2 Relevant requirements and established procedu the work are communicated to all personnel and identified for all work sites. | ures for d | |
| towers | .3 OHS policies and procedures related to require and established procedures for the <i>inspection</i> <i>overhead structures and electrical apparatus</i> towers are obtained and understood for the pur the work to be performed. | ments <i>of</i> s used on poses of | |
| | .4 Work is prioritized and sequenced following cor with others for completion within acceptable tim and in accordance with established procedures | nsultation eframes | |
| | .5 Hazards are identified; OHS risks assessed and measures are prioritized, implemented and mor including emergency exits kept clear according established procedures. | d control hitored to | |
| | .6 Relevant work permits are obtained to access a perform work according to requirements and/or established procedures. | Ind | |
| | .7 Resources including personnel, <i>equipment</i> , too personal protective equipment required for the j identified, scheduled and obtained and, in work | ols and ob are ing order. | |
| | .8 Relevant personnel at work site are confirmed of First Aid, Tower/Pole Top Rescue and other relation procedures according to requirements. | current in ated work | |

| Page 19 of 165 Ministry of Edu Copyrigh | DN Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|--|---|------------------------|
|--|---|------------------------|

| | | 1.9 | Liaison and personnel, resolved to | d communication issues with other/a authorities, clients and land owners carry out work. | authorized s are |
|----|--|----------------|--|---|--|
| | | 1.10 | Site is prep minimize ri individuals | pared according to the work schedu sk and damage to property, comme in accordance with established pro | le and to erce, and cedures. |
| | | 1.11 | Personnel poperators a respective accordance | participating in the work, including p and contractors, are fully briefed and responsibilities confirmed where ap e with established procedures. | olant d oplicable in |
| | | 1.12 | Traffic man | agement plan is identified and imp | lemented. |
| 2. | Carry out inspection of overhead structures and | 2.1 | OHS and s reduce the monitored a and/or esta | ustainable energy principles and pr incidents of accidents and minimize and followed in accordance with rea ablished procedures. | actices to e waste are quirements |
| | electrical apparatus used on towers | 2.2 | Lifting, clim and use of practices a requiremer | bing, working in confined spaces a power tools/equipment, techniques re safely followed and, currency ac hts confirmed. | nd aloft, and cording to |
| | | 2.3 | Essential k the safe ins apparatus i agreed time minimum o | nowledge and associated kills are a spection of overhead structures and used on towers to ensure completic eframe and, to quality standards wi f waste according to requirements. | applied in I electrical on in an th a |
| | | 2.4 | Inspection apparatus with the wo procedures | of overhead structures and electric used on towers is carried out, in ac ork schedule and requirements/esta s. | al cordance blished |
| | | 2.5 | Hazard war hazards an immediate establishec | rnings and safety signs are recogni ad assessed OHS risks are reported authorized persons for directions a d procedures. | zed and I to the ccording to |
| | | 2.6 | Known solu using acqu skills. | utions to a variety of problems are a ired essential knowledge and assoc | applied ciated |
| | | 2.7 | On-going c accordance | hecks of quality of the work are und e with instructions and established p | dertaken in procedures. |
| 3. | Complete the inspection of overhead | 3.1 | Work unde conformand in accordar | rtaken is checked against works sc ce with requirements and anomalien nce with established procedures. | hedule for s reported |
| | structures and electrical apparatus | 3.2 | Accidents a requiremer | and/or injuries are reported in accor nts/established procedures. | dance with |
| | used on | 3.3 | Work site is | s rehabilitated, cleaned up and mac | le safe in |
| P | age 20 of 165 | Ministry Co | of Education pyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |

| towers | | accordance with established procedures. |
|--------|-----|---|
| | 3.4 | Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures. |
| | 3.5 | Relevant work permit(s) are signed off and, overhead structures and electrical apparatus used on towers are returned to service in accordance with requirements. |
| | 3.6 | Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified. |

| Variable | Range | | |
|--|--|--|--|
| Inspection of overhead structures such as poles and/or other structures other than towers and electrical apparatus and equipment | Inspection may be carried out on foot, and/or by conventional ground-based vehicle, or from the air. Aircraft may be helicopters or fixed-wing types. Inspection techniques include use of X-ray and infrar camera. Items to be inspected may include overhead poles ar structures, but not towers. Types of electrical apparatus to be inspected include overhead conductors and cables, underground cable and overhead transition points and, electrical equipm such as pole mounted transformers and air-break switches, hardware, such as insulators, surge arresto and cross-arms and or earthing systems. | | |
| The following constants and variables included: | Appropriate and relevant persons (see Personnel) Appropriate authorities Appropriate work platform Assessing risk Assessment Authorization Confined space Diagnostic, testing and restoration Documenting detail work events, record keeping and or storage of information Drawings and specifications Emergency Environmental and sustainable energy procedures Environmental management documentation Established procedures Fall prevention Hazards Identifying hazards | | |
| Page 21 of 165 | Vinistry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | | |

| Inspect |
|--|
| Legislation |
| • MSDS |
| Notification |
| OHS practices |
| |
| Of IS issues Dermite and/or permite to work |
| |
| Personnel. |
| Quality assurance systems |
| Requirements |
| Testing procedures |
| Work clearance systems Environmental legislation |

| Evidence Guide | |
|----------------------------|---|
| Critical Aspects of | Evidence that shows a candidate is able to: |
| Competence | Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures |
| | Apply sustainable energy principles and practices |
| | Conduct work observing the relevant legislation, regulations, polices and workplace procedures |
| Underpinning | Demonstrates knowledge of: |
| Knowledge and Attitudes | inspecting overhead structures and electrical apparatus (poles /structures) |
| | Poles and structures inspection principles |
| | Power line inspection principles |
| Underpinning | Demonstrates skills to: |
| Skills | safe working practices and applying OHS practices |
| | Poles and structures inspection |
| | Power line inspection |
| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. |
| Methods of Assessment | Competence may be assessed through: |
| | Interview / Written Test |
| | Observation / Demonstration with Oral Questioning |
| Context of Assessment | Competence may be assessed in the work place or in a simulated work place setting. |

| Page 22 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level III | | |
|---|--|--|
| Unit Title | Develop HV Switching Schedule | |
| Unit Code | EIS TIM3 06 0612 | |
| Unit Descriptor | This unit covers the preparation of a basic switching schedule for interconnected HV network plant. It includes planning basic outages and taking into account loading of network components. It also includes the calculation of network loading conditions to ensure the network is operating within designed parameters. | |

| Elements | Perf | Performance Criteria | | |
|--|-------------|--|---|--|
| Prepare/plan to develop H\ switching schedules | / 1.1 | Works sche requiremen are obtaine and the ext for planning | edule(s), including drawings, plans, hts, established procedures, and ma ed, analyzed, if necessary, by site ir rent of the preparation of the work o g and coordination. | aterial lists, hspection letermined |
| | 1.2 | Work is prid and effective for complete standard and | oritized and sequenced for the mos ve outcome following consultation v ion within acceptable timeframes, t nd in accordance with established p | t efficient vith others o a quality procedures. |
| | 1.3 | Risk contro evaluated a | I measures are identified, prioritize against the work schedule. | d and |
| | 1.4 | Relevant re the work ar identified fo | equirements and established proce re communicated to all personnel a pr all work sites. | dures for nd |
| | 1.5 | Hazards ar measures a including en systems of established | e identified, OHS risks assessed an are prioritized , implemented and m mergency exits kept clear, to ensur work are followed and according to procedures. | nd control onitored e safe |
| | 1.6 | Relevant w performance establishee | ork permits are secured to coordinate of work according to requirement procedures. | ate the ts and/or |
| | 1.7 | Resources personal pr identified, s safe and te | including personnel, equipment, to otective equipment required for the scheduled and coordinated and cor ochnical working order. | ols and 9 job are firmed in a |
| | 1.8 | Clients/Cus and/or optic requiremen | stomers are provided with possible ons within the scope, acceptable co ats. | solutions ost and |
| | 1.9 | Personnel | participating in the work, including p | olant |
| Page 23 of 165 | Ministry Co | of Education pyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |

| | operators and contractors, are fully briefed and respective responsibilities coordinated and authorized where applicable in accordance with established procedures. |
|--|---|
| | 1.10 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work. |
| 2. Carry out the development of HV switching | 2.1 OHS and Sustainable Energy principles and practices to reduce the incidents of accidents and minimize waste are monitored and acted in accordance with requirements and/or established procedures. |
| schedules | 2.2 Hazard warnings and safety signs are recognized and hazards and assessed OHS risks are reported to the immediate authorized persons for directions according to established procedures. |
| | 2.3 Remedial actions are taken to overcome any shortfalls encountered in the work schedule according to requirements and/or established procedures. |
| | 2.4 Development of <i>HV switching schedules</i> is carried out, in accordance with the work schedule and requirements and/or established procedures. |
| | 2.5 Essential Knowledge and Associated Skills applied to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements. |
| | 2.6 Solutions to non-routine problems are identified and acted using acquired Essential Knowledge and Associated Skills according to requirements. |
| | 2.7 On going checks of quality of the work are undertaken in accordance with requirements and established procedures to ensure a quality like outcome is achieved for the client/customer and to a community/industry standard. |
| Complete development of HV switching | 3.1 Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures. |
| schedules | 3.2 Accidents and/or injuries are reported and followed up in accordance with requirements/established procedures. |
| | 3.3 Ensure relevant work permit(s) are signed off and plant is returned to service and advised to client/customer in accordance with requirements. |
| | 3.4 Works completion records, reports, as installed /modified drawing(s) and/or documentation and information are |
| Page 24 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 |

| confirmed, processed and appropriate personnel notified. |
|--|
| |

| Variable | Range |
|---|---|
| Development of HV switching schedules and include the use of: | system diagrams data schedules system loading data and use of computer based systems |
| The following constants and variables included: | Appropriate and relevant persons (see Personnel) Appropriate authorities Appropriate work platform Assessing risk Assessment Authorization Confined space Diagnostic, testing and restoration Documenting detail work events, record keeping and or storage of information Drawings and specifications Emergency Environmental and sustainable energy procedures Environmental legislation Environmental management documentation Established procedures Fall prevention Hazards Identifying hazards Inspect Legislation OHS practices OHS practices OHS sues Permits and/or permits to work Personnel Quality assurance systems Requirements Testing procedures |

| Evidence Guide | |
|--|--|
| Critical Aspects of Competence | Evidence that shows a candidate is able to: Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures Apply sustainable energy principles and practices Conduct work observing the relevant legislation, regulations, polices and workplace procedures |
| Underpinning Knowledge and Attitudes | Demonstrates knowledge of: developing an HV switching schedule Electrical equipment - HV and LV Power line High voltage switching principles High voltage fault switching principles High voltage distribution transformer principles System switching operations and authorization procedures - HV High voltage overhead and substation switching principles High voltage switching instruction preparation Enterprises specific - polices and procedure instructions Enterprises specific - technical drawing and documents Enterprise specific - switching diagrams Enterprise specific - specialized tools |
| Underpinning Skills | Demonstrates skills to: safe working practices and applying OHS practices Power line safety practices High voltage switching High voltage fault switching High voltage distribution transformer High voltage SWER system Feeder automation system High voltage overhead and substation switching |
| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. |
| Methods of Assessment | Competence may be assessed through: Interview / Written Test Observation / Demonstration with Oral Questioning |
| Context of Assessment | Competence may be assessed in the work place or in a simulated work place setting. |

| Page 26 of 165 | istry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|---------------------------------|--|------------------------|
|----------------|---------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level III | | |
|---|---|--|
| Unit Title | Coordinate Permit Procedures | |
| Unit Code | EIS TIM3 07 0612 | |
| Unit Descriptor | This unit covers the coordination of work procedures that require the issue of electrical permits to work and other permits for working on major parts of the electrical network. It encompasses the analysis and coordination of all work activities planned to be undertaken within more or less the same time timeframe to ensure that: the organization's work safety and statutory requirements are complied with; the extent of power interruption, and hence inconvenience to customers, is minimized; and the effective utilization of available resources, both from the organization and from its contractors to ensure all planned activities are timely completed to specified standards and requirements. | |

| Elements | Performance Criteria |
|--|--|
| Prepare/plan to coordinate permit procedures | 1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are obtained, analyzed, if necessary, by site inspection and the extent of the preparation of the work determined for planning and coordination. |
| | 1.2 Work is prioritized and sequenced for the most efficient and effective outcome following consultation with others for completion within acceptable timeframes, to a quality standard and in accordance with established procedures. |
| | 1.3 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites. |
| | 1.4 Hazards are identified, OHS risks assessed and control measures are prioritized, implemented and monitored including emergency exits kept clear, to ensure safe systems of work are followed and according to established procedures. |
| | 1.5 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures. |
| | 1.6 Resources including personnel, equipment, tools and personal protective equipment required for the job are identified, scheduled and applied in the coordination of permit procedures according to established procedures. |
| | Power Transmission Systems |

| Page 27 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| | 1.7 Clients/customers are provided with possible solutions and/or options within the scope, acceptable cost and requirements. |
|--|---|
| | 1.8 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work. |
| 2. Carry out the coordination of permit procedures | 2.1 OHS and Sustainable Energy principles and practices to reduce the incidents of accidents and minimize waste are monitored and acted in accordance with requirements and/or established procedures. |
| | 2.2 Hazard warnings and safety signs are recognized and hazards and assessed OHS risks are reported to the immediate authorized persons for directions according to established procedures. |
| | 2.3 Remedial actions are taken to overcome any shortfalls encountered in the work schedule according to requirements and/or established procedures. |
| | 2.4 Coordination of permit procedures is carried out, in accordance with the work schedule and requirements and/or established procedures. |
| | 2.5 Essential knowledge and associated skills in the safe co- ordination of permit procedures is applied to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements. |
| | 2.6 Solutions to non-routine problems are identified and acted using acquired Essential Knowledge and Associated Skills according to requirements. |
| | 2.7 Ongoing checks of quality of the work are undertaken in accordance with requirements and established procedures to ensure a quality like outcome is achieved for the client/customer and to a community/industry standard. |
| Complete the coordination of permit procedures | 3.1 Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures. |
| | 3.2 Relevant work permit(s) are signed off and, plant is returned to service and advised to client/customer in accordance with requirements. |
| | 3.3 Accidents and/or injuries are reported and followed up in accordance with requirements/established procedures. |
| | 3.4 Works completion records, reports, as installed /modified |

| Page 28 of 165 Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|---|--|------------------------|
|---|--|------------------------|

| drawing(s) and/or documentation and information are confirmed, processed and appropriate personnel notified. |
|--|
| |

| Variable | Range | | | |
|--|---|--|--|--|
| Coordination of permit procedures | May include but not be limited to the following: Enterprise/organizational specific co-ordination could involve: Electrical network diagrams, electrical permit to work system, other work permit system such as work in confined space or in hazardous environment, outsourcing procedures, hazard identification, risk classification and management procedures. Regulatory requirements include Occupational Health and Safety and electrical safety Computer based systems can be used in the generation of work schedules, programs and/or resource allocation. | | | |
| The following constants and variables included: | resource allocation. Appropriate and relevant persons (see Personnel) Appropriate authorities Assessing risk Assessment Authorization Documenting detail work events, record keeping and or storage of information Drawings and specifications Emergency Environmental and sustainable energy procedures Environmental legislation Environmental management documentation Established procedures Hazards Identifying hazards Inspect Legislation OHS practices OHS issues Permits and/or permits to work | | | |
| Page 29 of 165 | Inistry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | | | |

| • | Quality assurance systems |
|---|---------------------------|
| • | Requirements |
| • | Work clearance systems |

| Evidence Guide | |
|--|---|
| 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 Apply sustainable energy principles and practices Conduct work observing the relevant legislation, regulations, polices and workplace procedures |
| Underpinning Knowledge and Attitudes | Demonstrates knowledge of: Coordinating permit procedures High voltage switching principles High voltage fault switching principles High voltage distribution transformer principles High voltage SWER system Feeder automation system System switching operations and authorization procedures - HV System switching operations and authorization procedures - LV High voltage overhead and substation switching Principles Low voltage switching instruction preparation Low voltage switching instruction preparation Enterprises specific - polices and procedure instructions Enterprises specific - technical drawing and documents Enterprise specific - specialized tools |
| Underpinning Skills | Demonstrates skills to: safe working practices and applying OHS practices Power line safety practices High voltage switching High voltage fault switching High voltage distribution transformer System switching operations and authorization procedures - LV Feeder automation system System switching operations and authorization procedures - HV High voltage SWER system Enterprise specific – switching diagrams |

| Page 30 of 165 Ministry of Education Copyright Installation and Maintenance Ethiopia Occupational Standard Version 2 June 201 | Page 30 of 165 | e 30 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|--|----------------|-------------|------------------------------------|--|------------------------|
|--|----------------|-------------|------------------------------------|--|------------------------|

| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. | |
|--------------------------|---|--|
| Methods of | Competence may be assessed through: | |
| Assessment | Interview / Written Test | |
| | Observation / Demonstration with Oral Questioning | |
| Context of | Competence may be assessed in the work place or in a | |
| Assessment | simulated work place setting. | |

| Page 31 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level III | | | |
|---|--|--|--|
| Unit Title | Contribute to Coordinated HV Live Line Work | | |
| Unit Code | EIS TIM3 08 0612 | | |
| Unit Descriptor | This unit specifies the outcomes required of live line working team members to work effectively as a cohesive team to ensure safety of all team members and the community when undertaking high voltage (HV) live line work. It includes the pre-work briefing on tasks to be undertaken, roles of individual team members, identification of possible hazards, risk management analysis and implementation of palliative measures to control or mitigate the risk to acceptable levels. It also encompasses the monitoring of work performance to ensure safety, and the post-work debriefing to identify areas for continuous improvement. | | |

| Elements | Performance Criteria | | | |
|--|----------------------|--|--|--|
| 1. Plan to contribute to a coordinated high voltage live line work | 1.1 | Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are obtained, analyzed, if necessary, by site inspection and the extent of the preparation of the work determined for planning and coordination by the team. | | |
| team | 1.2 | Relevant requirements and established procedures for the work are communicated to all team members and identified for all work sites. | | |
| | 1.3 | OHS policies and procedures related to requirements and established procedures for the working on HV live lines are obtained and confirmed for the purposes of the work to be performed and discussed among all team members. | | |
| | 1.4 | Work is prioritized and sequenced following consultation with all team members to ensure safe systems of work are followed for completion within acceptable timeframes and in accordance with established procedures. | | |
| | 1.5 | OHS and live line work hazards are identified, risk assessments conducted and control measures are identified, prioritized, implemented and documented against the work schedule, including the checking of site weather and environmental conditions to ensure that live line work can be undertaken safely. | | |
| | 1.6 | Relevant live line work permits or authority for live line work are secured to coordinate the performance of work by the team according to requirements and/or | | |

| Page 32 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| | | established | l procedures. | |
|---|----------------|---|--|---|
| | 1.7 | Resources personal pr identified, s safe and te | including personnel, equipment, to rotective equipment required for the scheduled and coordinated and conechnical working order. | ols and job are firmed in a |
| | 1.8 | Personnel operators a respective where appl procedures | participating in the work, including p and contractors, are fully briefed and responsibilities coordinated and au icable in accordance with establish s. | olant d thorized ed |
| | 1.9 | Liaison and personnel, resolved ar | d communication issues with other/a authorities, clients and land owners and activities coordinated to carry ou | authorized s are t work. |
| | 1.10 | Site is prep minimize ri individuals | pared according to the work schedu sk and damage to property, comme in accordance with established pro | le and to erce, and cedures. |
| | 1.11 | All team me agree, with possible ro | embers to be engaged in the work o out ambiguity, on their respective re le changes during the course of wo | discuss and oles, and ırk. |
| | 1.12 | Positioning planned an requiremer | of road signs, barriers and warning d coordinated in accordance with hts. | g devices is |
| 2. Carry out the contribution t coordinated high voltage live line work | o 2.1 | OHS and S reduce the monitored a and/or esta live line wo | Sustainable Energy principles and p incidents of accidents and minimiz and acted in accordance with requi ablished procedures. In particular, e rking procedures are strictly adhere | eractices to e waste are rements established ed to. |
| | 2.2 | First Aid, R performed procedures | escue and other related work proce according to requirements and/or e | edures are stablished |
| | 2.3 | Lifting, clim equipment, are safely e | bing, working aloft, and use of pow techniques and practices, where a exercised according to requirement | ver tools/ applicable s. |
| | 2.4 | Live line pe are in place requiremen | ermits and other provisions for live I e as required, in accordance with th hts and established procedures. | ine work ie |
| | 2.5 | Essential K contribution work is app timeframe a waste acco | Cnowledge and Associated Skills in Con to coordinated high voltage li - blied to ensure completion in an agr and, to quality standards with a min- brding to requirements. | the safe ve line reed iimum of |
| | 2.6 | Work is une environmen requiremer | dertaken on HV Live Line in a team nt work according to the work scheo nts/ established procedures. | dule and |
| Page 33 of 165 | Ministry Co | of Education | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |

| | 2.7 | Work is shared among all team members in a coordinated manner as discussed and agreed during pre- work briefing. |
|---|------|---|
| | 2.8 | Hazard warnings and safety signs are recognized and hazards and assessed OHS risks are discussed with team members and reported to the immediate authorized persons for directions according to established procedures. |
| | 2.9 | Unplanned events in the maintenance of HV Live Line work are discussed among all team members and appropriate action undertaken accordingly. |
| | 2.10 | Solutions to non-routine problems are identified and acted using acquired essential knowledge and associated skills according to requirements. |
| | 2.11 | Ongoing checks of quality of the work are undertaken in accordance with requirements and established procedures to ensure a quality like outcome is achieved for the client/customer and to a community/industry standard. |
| Complete the contribution to coordinated high voltage | 3.1 | Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures. |
| live line work | 3.2 | Accidents and/or injuries are reported and followed up in accordance with requirements/established procedures. |
| | 3.3 | Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures. |
| | 3.4 | Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures. |
| | 3.5 | Relevant work permit(s) are signed off and, High Voltage Live Line work is returned to service and advised to client/customer in accordance with requirements. |
| | 3.6 | Works completion records, reports, as installed /modified drawing(s) and/or documentation and information are confirmed, processed and appropriate personnel notified. |
| | 3.7 | Aspects of work schedule are discussed identified via feedback with fellow team members and information on improvement forwarded to appropriate personnel according to established procedures. |

| Variable | Range | | |
|----------------|------------------------------------|--|------------------------|
| Page 34 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |

| Contribution to coordinated high voltage live line work and may include the following: | • This is a common unit for all developed live line working techniques such as hot stick, gloves and barrier, or bare hand. Technical details utilizing these live line respective units of competence for live line work. |
|---|--|
| | HV Live Line work may include the maintenance of energized HV electrical apparatus, conductors and cables. |
| | Work may be undertaken on ladders, insulated elevating work platforms or through the use of a work platform secured to a helicopter. |
| | The emphasis of this unit is to foster and promote effective team work live line work to ensure safety of all team members and the community during the course of work |

| Evidence Guide | |
|--|---|
| 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 Apply sustainable energy principles and practices Conduct work observing the relevant legislation, regulations, polices and workplace procedures |
| Underpinning Knowledge and Attitudes | Demonstrates knowledge of: contributing to coordinated high voltage live line work Occupational Health and Safety principles Statutory and safety considerations Fundamentals for working safely near live electrical apparatus Enterprise Specific - policy and procedures instructions Enterprise Specific - OHS Instructions |
| Underpinning Skills | Demonstrates skills to: safe working practices and applying OHS practices Electrical safe working practice Power line safety practices Enterprise specific - specialized tools Enterprise Specific - team work high voltage live line |
| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. |
| Methods of Assessment | Competence may be assessed through: Interview / Written Test Observation / Demonstration with Oral Questioning |
| Context of Assessment | Competence may be assessed in the work place or in a simulated work place setting. |
| Occupational Standard: Power Transmission Systems Installation and Maintenance Level III | |
|---|---|
| Unit Title | Maintain Energized Lines (Transmission) Using Live Line Stick Technique |
| Unit Code | EIS TIM3 09 0612 |
| Unit Descriptor | This unit covers the maintenance of energized high voltage transmission overhead electrical apparatus, i.e. live line work using line Stick techniques and includes the verification of the site conditions and the potential hazards, the conformation and calculation of physical loads and the selection of appropriate and authorized work method. It includes the preparation and cleaning of specialist material and tools in accordance with authorized technical instructions. It also encompasses the undertaking of OHS and safe working practices and the rendering inoperative of the automatic re- closing device including its restoration in accordance with the work plan and the procedure of issuing/accepting electrical access permits and or relevant work document. |

| Elements | Performance Criteria | | |
|---|----------------------|--|--|
| Prepare/plan to maintain energized lines (transmission) using live line stick technique | 1.1 | Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are obtained, analyzed, if necessary, by site inspection and the extent of the preparation of the work determined for planning and coordination. | |
| | 1.2 | Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites. | |
| | 1.3 | Hazards are identified, OHS risks assessed and control measures are prioritized, implemented and monitored including emergency exits kept clear, to ensure safe systems of work are followed and according to established procedures. | |
| | 1.4 | Work is prioritized and sequenced for the most efficient and effective outcome following consultation with others for completion within acceptable timeframes, to a quality standard and in accordance with established procedures. | |
| | | Risk control measures are identified, prioritized and evaluated against the work schedule. | |
| | 1.6 | Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures. | |

| Page 36 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| | | 1.7 | Resources including personnel, equipment, tools and personal protective equipment required for the job are identified, scheduled and coordinated and confirmed in a safe and technical working order. |
|----|---|------|--|
| | | 1.8 | Relevant personnel at work site are confirmed current in first aid, CPR, and other rescue procedures according to requirements. |
| | | 1.9 | Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work. |
| | | 1.10 | Site is prepared according to the work schedule and to minimize risk and damage to property, commerce, and individuals in accordance with established procedures. |
| | | 1.11 | Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities coordinated and authorized where applicable in accordance with established procedures. |
| | | 1.2 | Positioning of road signs, barriers and warning devices is planned in accordance with requirements. |
| 2. | Carry out the maintenance of energized lines | 2.1 | OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimize waste are monitored and acted in accordance with requirements and/or established procedures. |
| | (transmission) using live line stick technique | 2.2 | First Aid, CPR and other Rescue procedures and other related work procedures are performed according to requirements and/or established procedures. |
| | | 2.3 | Lifting, climbing, working aloft, and tools/equipment, techniques and practices are safely exercised according to requirements. |
| | | 2.4 | Hazard warnings and safety signs are recognized and hazards and assessed OHS risks are reported to the immediate authorized persons for directions according to established procedures. |
| | | 2.5 | Remedial actions are taken to overcome any shortfalls encountered in the work schedule according to requirements and/or established procedures. |
| | | 2.6 | <i>Maintenance of energized high voltage overhead</i> <i>electrical transmission apparatus</i> is carried out, in accordance with the work schedule and requirements and/or established procedures. |
| | | 2.7 | Essential knowledge and associated skills are applied in the safe maintenance of energized high voltage overhead electrical transmission apparatus to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to |

| Page 37 of 165 Ministry of Educa Copyright | DN Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|---|---|------------------------|
|---|---|------------------------|

| | | | requirements. |
|-----------------------------------|--|-----|---|
| | | 2.8 | Solutions to non-routine problems are identified and acted using acquired essential knowledge and associated skills according to requirements. |
| | | 2.9 | Ongoing checks of quality of the work are undertaken in accordance with requirements and established procedures to ensure a quality like outcome is achieved for the client/customer and to a community/industry standard |
| 3. | Complete the maintenance of energized | 3.1 | Work is checked against schedule for conformance, anomalies reported in accordance with established procedures. |
| lines (transmiss using live | lines (transmission) using live line | 3.2 | Accidents and /or injuries are reported and followed up in accordance with requirements/established procedures. |
| | stick technique | 3.3 | Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures. |
| | | 3.4 | Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures. |
| | | 3.5 | Relevant work permit(s) (live line) are signed off and client/ customer advised in accordance with requirements. |
| | | 3.6 | Works completion records, reports, as installed/modified drawing(s) and/or documentation and information are confirmed, processed and appropriate personnel notified. |

| Variable | Range |
|--|--|
| Maintenance of energized lines (transmission) using live line stick technique and includes: | the replacement of suspension and tension insulators, the calculating of conductor loads being both vertical and tension and conductor repairs |
| Maintenance includes: | Live line Stick care and maintenance including mandatory testing Rope care and maintenance including mandatory testing Electrical testing of insulators Repair conductors |

| Evidence Guide | | |
|---------------------|--|--|
| Critical Aspects of | Assessment requires evidence that the candidate: | |
| | | |

| Page 38 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| Competence | Implement occupational health and safety workplace procedures and practices including the use of risk control measures |
|--|--|
| | Apply sustainable energy principles and practices |
| | Conduct work observing the relevant legislation, regulations, polices and workplace procedures |
| Underpinning Knowledge and Attitudes | Demonstrates knowledge of: maintaining energized lines (transmission) using live line stick technique Basic rigging techniques Plant, equipment and tools used for HV line work HV principles High voltage switching principles High voltage fault switching principles High voltage distribution transformer principles |
| Underpinning Skills | Demonstrates skills to: safe working practices and applying OHS practices Installation and maintenance on transmission lines and associated equipment Live line working up to 132kV with Hot stick Live line working for voltages greater than 132kV and up to 500kV with hot stick Power line safety practices High voltage switching principles High voltage fault switching principles High voltage SWER system Feeder automation system |
| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. |
| Methods of Assessment | Competence may be assessed through: Interview / Written Test Observation / Demonstration with Oral Questioning |
| Context of Assessment | Competence may be assessed in the work place or in a simulated work place setting. |

| Page 39 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level III | |
|---|--|
| Unit Title | Maintain Energized Lines (Transmission) Using Bare Hand Technique |
| Unit Code | EIS TIM3 10 0612 |
| Unit Descriptor | This unit covers the maintenance of energized high voltage transmission overhead electrical apparatus, i.e. lives line work using Bare Hand techniques and includes the verification of the site conditions and the potential hazards, the conformation and calculation of physical loads and the selection of appropriate and authorized work method. It includes the preparation and cleaning of specialist material and tools in accordance with authorized technical instructions. It also encompasses the undertaking of OHS and safe working practices and the rendering inoperative of the automatic reclosing device including its restoration in accordance with the work plan and the procedure of issuing/accepting electrical access permits and or relevant work document. |

| Elements | Per | Performance Criteria | | | |
|--|------------------------------------|--|---|--|--|
| Prepare/plan to maintain energized lines (Transmission |) | Works sche requiremen are obtaine and the ext for planning | edule(s), including drawings, plans, hts, established procedures, and ma ed, analyzed, if necessary, by site ir tent of the preparation of the work o g and coordination. | aterial lists, hspection letermined | |
| using Bare Hand technique | 1.2 | Relevant re the work ar identified fo | equirements and established procee re communicated to all personnel a or all work sites. | dures for nd | |
| | 1.3 | Hazards ar measures a including en systems of established | e identified, OHS risks assessed an are prioritized , implemented and m mergency exits kept clear, to ensur work are followed and according to procedures. | nd control onitored e safe | |
| | 1.4 | Work is prid and effectiv for complet standard a | oritized and sequenced for the mos ve outcome following consultation v tion within acceptable timeframes, t nd in accordance with established p | t efficient vith others o a quality procedures. | |
| | 1.5 | Risk contro evaluated a | I measures are identified, prioritize against the work schedule. | d and | |
| 1.6 Relevant work permits a | | ork permits are secured to coordination | ate the | | |
| Page 40 of 165 | Ministry of Education Copyright | | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 | |

| | | performance established | e of work according to requirement procedures. | ts and/or |
|--|----------------|--|---|---------------------------------------|
| | 1.7 | Resources personal pr identified, s safe and te | including personnel, equipment, to otective equipment required for the scheduled and coordinated and con chnical working order. | ols and job are firmed in a |
| | 1.8 | Relevant po First Aid, C requiremen | ersonnel at work site are confirmed PR, and other rescue procedures a its. | current in according to |
| | 1.9 | Liaison and personnel, resolved ar | l communication issues with other/a authorities, clients and land owners nd activities coordinated to carry ou | authorized s are t work. |
| | 1.10 | Site is prep minimize ris individuals | ared according to the work schedu sk and damage to property, comme in accordance with established pro | le and to erce, and cedures. |
| | 1.11 | Personnel operators a respective where appl procedures | participating in the work, including p and contractors, are fully briefed and responsibilities coordinated and au- icable in accordance with establish s. | olant d thorized ed |
| | 1.12 | Positioning planned an requiremer | of road signs, barriers and warning d coordinated in accordance with hts. | g devices is |
| 2. Carry out the maintenance of energized lines | 2.1 | OHS and S reduce the monitored a and/or esta | Sustainable Energy principles and p incidents of accidents and minimize and acted in accordance with requin blished procedures. | ractices to e waste are rements |
| (transmission) using bare hand technique | 2.2 | First aid, C related wor requiremen | PR and other rescue procedures and been been been been been been been be | nd other ding to |
| technique | 2.3 | Lifting, clim and tools/e exercised a | bing, working in confined spaces a quipment, techniques and practices according to requirements. | nd aloft, s are safely |
| | 2.4 | Hazard war hazards an immediate established | rnings and safety signs are recogni d assessed OHS risks are reported authorized persons for directions a l procedures. | zed and I to the ccording to |
| | 2.5 | Remedial a encountere requiremen | actions are taken to overcome any s of in the work schedule according to ts and/or established procedures. | shortfalls o |
| | 2.6 | Maintenan electrical t accordance and/or esta | ce of energized high voltage over transmission apparatus is carried with the work schedule and requir blished procedures. | e rhead out, in ements |
| Page 41 of 165 | linistry Co | of Education pyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |

| | | 2.7 | Essential Knowledge and Associated Skills in the safe maintenance of energized high voltage overhead electrical transmission apparatus is applied to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements. |
|----|---|-----|---|
| | | 2.8 | Solutions to non-routine problems are identified and acted using acquired Essential Knowledge and Associated Skills according to requirements. |
| | | 2.9 | On-going checks of quality of the work are undertaken in accordance with requirements and established procedures to ensure a quality like outcome is achieved for the client/customer and to a community/industry standard. |
| 3. | Complete the maintenance of energized lines (transmission) using bare hand technique | 3.1 | Work is checked against schedule for conformance, anomalies reported in accordance with established procedures. |
| | | 3.2 | Accidents and/or injuries are reported and followed up in accordance with requirements/established procedures. |
| | | 3.3 | Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures. |
| | | 3.4 | Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures. |
| | | 3.5 | Relevant work permit(s) (live line) are signed off and client/customer advised in accordance with requirements. |
| | | 3.6 | Works completion records, reports, as installed /modified drawing(s) and/or documentation and information are confirmed, processed and appropriate personnel notified |

| Variable | Range | | |
|---|---|--|--|
| Maintenance of energized lines (transmission) | • the replacement of suspension and tension insulators and the calculating of conductor loads being both vertical and tension and conductor repairs | | |
| using Bare Hand techniques and includes: | the work shall include rope care and maintenance including mandatory testing; electrical testing of insulators | | |
| The following constants and variables include | Conductive clothing application and maintenance Appropriate and relevant persons (see Personnel) Appropriate authorities Appropriate work platform | | |
| Page 42 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | | |

| in this unit: | Assessing risk |
|---------------|--|
| | Assessment |
| | Diagnostic, testing and restoration |
| | Documenting detail work events, record keeping and or storage of information |
| | Drawings and specifications |
| | Emergency |
| | Environmental and sustainable energy procedures |
| | Environmental legislation, management documentation |
| | Established procedures |
| | Fall prevention and Hazards |
| | Identifying hazards |
| | Inspect |
| | Legislation MSDS |
| | OHS practices and issues |
| | Permits and/or permits to work |
| | Personnel |
| | Quality assurance systems |
| | Testing procedures |
| | Work clearance systems |

| Evidence Guide | | | |
|--|---|--|--|
| 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 Apply sustainable energy principles and practices Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures | | |
| Underpinning Knowledge and Attitudes | Demonstrates knowledge of: maintaining energized lines (transmission) using Bare Hand technique Extra high voltage - Bare-Hand live-line principles Extra high voltage - Bare-Hand live line Procedures HV principles | | |
| Underpinning Skills | Demonstrates skills to: safe working practices and applying OHS practices Live line working up to 132kV with hot stick Power line safety practices | | |
| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. | | |
| Methods of Assessment | Competence may be assessed through: Interview / Written Test Observation / Demonstration with Oral Questioning | | |
| Page 43 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | | |

| Context of | Competence may be assessed in the work place or in a |
|------------|--|
| Assessment | simulated work place setting. |

| Page 44 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| Occupational Star | Occupational Standard: Power Transmission Systems Installation and Maintenance Level III | | | |
|-------------------|--|--|--|--|
| Unit Title | Maintain Bare Hand Technique on a Helicopter Platform | | | |
| Unit Code | EIS TIM3 11 0612 | | | |
| Unit Descriptor | This unit covers the maintenance of energized high voltage transmission overhead electrical apparatus, i.e. lives line work using Bare Hand techniques from a helicopter platform and includes the verification of the site conditions and the potential hazards, the conformation and calculation of physical loads and the selection of appropriate and authorized work method. It includes the preparation and cleaning of specialist material and tools in accordance with authorized technical instructions. It also encompasses the undertaking of OHS and safe working practices and the rendering inoperative of the automatic re-closing device including its restoration in accordance with the work plan and the procedure of issuing/accepting electrical access permits and or relevant work document. | | | |

| Elements | Pe | Performance Criteria | | |
|---|------------------------------------|---|---|---|
| Prepare/plan to maintain energized lines (transmission) | n 1.1 n) | Works sch requiremer are obtaine and the ext for planning | edule(s), including drawings, plans, nts, established procedures, and ma ed, analyzed, if necessary, by site in tent of the preparation of the work o g and coordination. | aterial lists, hspection determined |
| using Bare Hand technique fro a helicopter | 1.2 om | Work is pri and effectiv for complet standard a | oritized and sequenced for the mosve outcome following consultation v tion within acceptable timeframes, t nd in accordance with established p | t efficient with others to a quality procedures. |
| platom | 1.3 | Risk contro evaluated a | ol measures are identified, prioritize against the work method. | d and |
| | 1.4 | Relevant re the work and identified for | equirements and established proce re communicated to all personnel a or all work sites. | dures for nd |
| | 1.5 | Hazards ar measures including e systems of established | e identified, OHS risks assessed a are prioritized , implemented and m mergency exits kept clear, to ensur work are followed and according to procedures. | nd control ionitored re safe |
| | 1.6 | Relevant w performance establishee | work permits are secured to coordinate the nce of work according to requirements and/or ed procedures. | |
| | | Resources | including personnel, equipment, to | ols and |
| Page 45 of 165 | Ministry of Education Copyright | | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |

| | | | personal pri identified, s safe and te | rotective equipment required for the scheduled and coordinated and con schnical working order. | e job are firmed in a |
|----|--|--|--|--|---|
| | 1.8 | Relevant p First aid, C requiremer | ersonnel at work site are confirmed PR, and other rescue procedures a hts. | current in according to | |
| | | 1.9 | Liaison and personnel, resolved ar | d communication issues with other/a authorities, clients and land owners nd activities coordinated to carry ou | authorized are t work. |
| | | 1.10 | Site is prep minimize ris individuals | pared according to the work schedu sk and damage to property, comme in accordance with established pro | le and to erce, and cedures. |
| | | 1.11 | Personnel operators a in respectiv where appl procedures | participating in the work, including p and contractors, are fully briefed and ve responsibilities coordinated and a icable in accordance with establish a. | blant d instructed authorized ed |
| | | | Positioning planned an requiremer | of road signs, barriers and warning d coordinated in accordance with hts. | devices is |
| 2. | 2. Carry out the maintenance of energized lines (transmission) using bare hand | 2.1 | OHS and s reduce the monitored a and/or esta | ustainable energy principles and pr incidents of accidents and minimize and acted in accordance with requi- ablished procedures. | actices to e waste are rements |
| | | 2.2 | First aid, C related wor requiremer | PR and other Rescue procedures a k procedures are performed accord hts and/or established procedures. | and other ding to |
| | a helicopter platform | 2.3 | Lifting and safely exer | tools/equipment, techniques and pr | ractices are |
| | | 2.4 | Hazard war hazards an immediate established | rnings and safety signs are recogni d assessed OHS risks are reported authorized persons for directions a procedures. | zed and I to the ccording to |
| | | 2.5 | Remedial a encountere requiremer | actions are taken to overcome any s ed in the work schedule according to hts and/or established procedures. | shortfalls D |
| | 2.6 | 2.6 | Maintenan electrical ta accordance and/or esta | the of energized high voltage over transmission apparatus is carried with the work schedule and requir ablished procedures. | e rhead out, in ements |
| | | 2.7 | Essential k the safe ma overhead e completion | nowledge and associated skills are aintenance of energized high voltag electrical transmission apparatus to in an agreed timeframe and, to qua | applied in je ensure ality |
| P | age 46 of 165 | Ministry o Co | of Education | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |

| | | | standards with a minimum of waste according to requirements. |
|----|--|-----|---|
| | | 2.8 | Solutions to non-routine problems are identified and acted using acquired essential knowledge and associated skills according to requirements. |
| | | 2.9 | On-going checks of quality of the work are undertaken in accordance with requirements and established procedures to ensure a quality like outcome is achieved for the client/customer and to a community/industry standard. |
| 3. | Complete the maintenance of energized lines (transmission) using bare hand technique from a helicopter platform | 3.1 | Work is checked against schedule for conformance, anomalies reported in accordance with established procedures. |
| | | 3.2 | Accidents and/or injuries are reported and followed up in accordance with requirements/established procedures. |
| | | 3.3 | Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures |
| | | 3.4 | Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures. |
| | | 3.5 | Relevant work permit(s) (live line) are signed off and client/customer advised in accordance with requirements. |
| | | 3.6 | Works completion records, reports, as installed /modified drawing(s) and/or documentation and information are confirmed, processed and appropriate personnel notified. |

| Variable | Range |
|---|--|
| Maintain energized lines (transmission) using Bare Hand technique from a helicopter platform: | the maintenance of conductors and hardware, The calculating of conductor load in tension. In addition the work shall include conductive clothing application and maintenance; working from a helicopter platform; safe working practices in and around aircraft |
| The following constants and variables included in this unit: | Appropriate and relevant persons (see Personnel) Appropriate authorities Appropriate work platform Assessing risk Assessment Authorization Confined space Diagnostic, testing and restoration |

| Documenting detail work events, record keeping and or storage of information |
|--|
| Drawings and specifications |
| Emergency |
| Environmental and sustainable energy procedures |
| Environmental logislation |
| Environmental registration |
| Environmental management documentation |
| Established procedures |
| Fall prevention |
| Hazards |
| Identifying hazards |
| Inspect |
| Legislation |
| MSDS |
| Notification |
| OHS practices |
| OHS issues |
| Permits and/or permits to work |
| Personnel |
| Quality assurance systems |
| Requirements |
| Testing procedures |
| Work clearance systems |
| |

| Evidence Guide | 9 | | |
|--------------------------|---|--|--|
| Critical Aspects | of Assessment requires evidence that the candidate: | | |
| Competence | Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures | | |
| | Apply sustainable energy principles and practices | | |
| | Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures | | |
| Underpinning | Demonstrates knowledge of: | | |
| Knowledge and | • Extra high voltage bare-hand live-line using a helicopter | | |
| Attitudes | HV principles | | |
| Underpinning | Demonstrates skills to: | | |
| Skills | safe working practices and applying OHS practices | | |
| | Power line safety practices | | |
| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. | | |
| Methods of | Competence may be assessed through: | | |
| Assessment | Interview / Written Test | | |
| Page 48 of 165 | Ministry of Education Copyright Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard June 2012 | | |

Ethiopia Occupational Standard

| | Observation / Demonstration with Oral Questioning |
|--------------------------|--|
| Context of Assessment | Competence may be assessed in the work place or in a simulated work place setting. |

| Page 49 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level III | | |
|---|---|--|
| Unit Title | Monitor Implementation of Workplan/Activities | |
| Unit Code | EIS TIM3 12 0612 | |
| Unit Descriptor | This unit covers competence required to oversee and monitor the quality of work operations within an enterprise. This unit may be carried out by team leaders or supervisors. | |

| Elements | nents Performance Criteria | | |
|---|----------------------------|--|--|
| 1. Monitor and improve | 1.1 | Efficiency and service levels are monitored on an ongoing basis. | |
| workplace operations | 1.2 | Operations in the workplace support overall enterprise goals and quality assurance initiatives. | |
| | 1.3 | Quality <i>problems</i> and issues are promptly identified and adjustments are made accordingly. | |
| | 1.4 | Procedures and systems are changed in consultation with colleagues to improve efficiency and effectiveness. | |
| | 1.5 | Colleagues are consulted about ways to improve efficiency and service levels. | |
| 2. Plan and | 2.1 | Current workload of colleagues is accurately assessed. | |
| organise workflow | 2.2 | Work is scheduled in a manner which enhances efficiency and customer service quality. | |
| | 2.3 | Work is delegated to appropriate people in accordance with principles of delegation. | |
| | 2.4 | Workflow is assessed against agreed objectives and timelines and colleagues are assisted in prioritisation of workload. | |
| | 2.5 | Input is provided to appropriate management regarding staffing needs. | |
| 3. Maintain workplace | 3.1 | Workplace records are accurately completed and submitted within required timeframes. | |
| records | 3.2 | Where appropriate completion of records is delegated and monitored prior to submission. | |
| 4. Solve problems and make decisions | 4.1 | Workplace problems are promptly identified and considered from an operational and customer service perspective. | |
| | 4.2 | Short term action in initiated to resolve the immediate problem where appropriate. | |
| | 4.3 | Problems are analysed for any long term impact and | |
| Page 50 of 165 | Ministry Co | of Education pyright Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard June 2012 | |

| | potential solutions are assessed and acted in consultation with relevant colleagues. |
|-----|--|
| 4.4 | Where problem is raised by a team member, they are encouraged to participate in solving the problem. |
| 4.5 | Follow up action is taken to monitor the effectiveness of solutions in the workplace. |

| Variables | Range |
|-----------|---|
| Problems | May include but not limited to: difficult customer service situations equipment breakdown/technical failure delays and time difficulties |
| Workplace | competence May include but is not limited to: |
| records | staff records and regular performance reports |

| Evidence Guide | |
|--|---|
| Critical Aspects of Competence | Assessment must confirm appropriate knowledge and skills to: ability to effectively monitor and respond to a range of common operational and service issues in the workplace understanding of the role of staff involved in workplace monitoring knowledge of quality assurance, principles of workflow planning, delegation and problem solving |
| Underpinning Knowledge and Attitudes | Demonstrate knowledge of: roles and responsibilities in monitoring work operations overview of leadership and management responsibilities principles of work planning and principles of delegation typical work organization methods appropriate to the sector quality assurance principles and time management problem solving and decision making processes industrial and/or legislative issues which affect short term work organization as appropriate to industry sector |
| Underpinning Skills | Demonstrate skills to: monitoring and improving workplace operations planning and organizing workflow maintaining workplace records |
| Resource Implications | Access is required to real or appropriately simulated work areas, materials and equipment |
| Methods of Assessment | Competence may be assessed through: Interview / Written Test Observation / Demonstration with Oral Questioning |
| Context of Assessment | Competence may be assessed in the workplace or in a simulated workplace setting |

| Page 51 of 165 Ministry of Copy | tion Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|---------------------------------|---|------------------------|
|---------------------------------|---|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level III | | |
|---|---|--|
| Unit Title | Apply Quality Control | |
| Unit Code | EIS TIM3 13 0612 | |
| Unit Descriptor | This unit covers the knowledge, attitudes and skills required in applying quality control in the work operation and activities. | |

| Elements Performance Criteria | | |
|---|---|--|
| 1. Implement quality | 1.1 Agreed quality standard and procedures are acquired and confirmed | |
| standards | 1.2 Standard procedures are introduced to organizational staff / personnel. | |
| | 1.3 Quality standard and procedures documents are provided to employees in accordance with the organization policy. | |
| | 1.4 Standard procedures are revised / updated when necessary | |
| 2. Assess quality of service | 2.1 Services delivered are <i>checked</i> against organization <i>quality standards</i> and specifications | |
| delivered | 2.2 Service delivered are evaluated using the appropriate evaluation <i>parameters</i> and in accordance with organization standards | |
| | 2.3 Causes of any identified faults are identified and corrective actions are taken in accordance with organization policies and procedures | |
| 3. Record information | 3.1 Basic information on the quality performance is recorded in accordance with organization procedures | |
| | 3.2 Records of work quality are maintained according to the requirements of the organization | |
| 4. Study causes of quality deviations | 4.1 Causes of deviations from final outputs or services are investigated and reported in accordance with organization procedures | |
| | 4.2 Suitable preventive action is recommended based on organization <i>quality standards</i> and identified causes of deviation from specified quality standards of final service or output | |
| 5. Complete documentation | 5.1 Information on quality and other indicators of service performance is recorded. | |
| | 5.2 All service processes and outcomes are recorded. | |

| Page 52 of 165 Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|--|--|------------------------|
|--|--|------------------------|

| Variable | Range | | | |
|-------------------|---|--|--|--|
| Quality check | Check against design / specifications | | | |
| | Visual inspection and Physical inspection | | | |
| Quality standards | materials | | | |
| | components | | | |
| | • process | | | |
| | procedures | | | |
| Quality | standard design / specifications | | | |
| parameters | material specification | | | |

| Evidence Guide | |
|-----------------------------------|--|
| Critical Aspects of Competence | Assessment requires evidence that the candidate: Checked completed work continuously against organization standard Identified and isolated faulty or poor service Checked service delivered against organization standards Identified and applied corrective actions on the causes of identified faults or error Recorded basic information regarding quality performance Investigated causes of deviations of services against standard |
| Underpinning Knowledge | Recommended suitable preventive actions Demonstrates knowledge of: Relevant quality standards, policies and procedures Characteristics of services Safety environment aspects of service processes Evaluation techniques and quality checking procedures Workplace procedures and reporting procedures |
| Underpinning Skills | Demonstrates skills to: interpret work instructions, specifications and standards appropriate to the required work or service carry out relevant performance evaluation maintain accurate work records meet work specifications and requirements communicate effectively within defined workplace procedures |
| Resource Implications | The following resources should be provided: Access to relevant workplace or appropriately simulated environment and materials relevant to the activity/ task |
| Methods of Assessment | Competence may be accessed through: Interview / Written Test Observation / Demonstration with Oral Questioning |
| Context of Assessment | Competence may be assessed in the workplace or in a simulated workplace setting |

| Page 53 of 165 Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|---|--|------------------------|
|---|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level III | | |
|---|---|--|
| Unit Title | Lead Workplace Communication | |
| Unit Code | EIS TIM3 14 0612 | |
| Unit Descriptor | This unit covers the knowledge, attitudes and skills needed to lead in the dissemination and discussion of information and issues in the workplace. | |

| Elements | Perf | Performance Criteria | | |
|--|------|--|--|--|
| 1. Communicate | 1.1 | Appropriate communication method is selected | | |
| information about | 1.2 | Multiple operations involving several topics areas are communicated accordingly | | |
| processes | 1.3 | Questions are used to gain extra information | | |
| | 1.4 | Correct sources of information are identified | | |
| | 1.5 | Information is selected and organized correctly | | |
| | 1.6 | Verbal and written reporting is undertaken when required | | |
| | 1.7 | Communication skills are maintained in all situations | | |
| 2. Lead | 2.1 | Response to workplace issues are sought | | |
| workplace | 2.2 | Response to workplace issues are provided immediately | | |
| | 2.3 | Constructive contributions are made to workplace discussions on such issues as production, quality and safety | | |
| | 2.4 | Goals/objectives and action plan undertaken in the workplace are communicated. | | |
| 3. Identify and communicate issues arising | 3.1 | Issues and problems are identified as they arise | | |
| | 3.2 | Information regarding problems and issues are organized coherently to ensure clear and effective communication | | |
| workplace | 3.3 | Dialogue is initiated with appropriate staff/personnel | | |
| | 3.4 | Communication problems and issues are raised as they arise | | |

| Variable | Range | |
|--------------------------|--|--|
| Methods of communication | Non-verbal gestures Verbal Face to face Two-way radio Speaking to groups | Using telephone Written Using Internet Cell phone |

| Page 54 of 165 Ministry of Education Copyright Power Transmiss Copyright Ethiopia Occupati | on Systems laintenance nal Standard |
|---|---|
|---|---|

| Evidence Guide | | |
|---------------------|---|--|
| Critical Aspects of | Demonstrates skills and knowledge to: | |
| Competence | Dealt with a range of communication/information at one time | |
| | Made constructive contributions in workplace issues | |
| | Sought workplace issues effectively | |
| | Responded to workplace issues promptly | |
| | Presented information clearly and effectively written form | |
| | Used appropriate sources of information | |
| | Asked appropriate questions | |
| | Provided accurate information | |
| Underpinning | Demonstrates knowledge of: | |
| Knowledge and | Organization requirements for written and electronic | |
| Attitudes | communication methods | |
| | Effective verbal communication methods | |
| Underpinning | Demonstrates skills to: | |
| Skills | Organize information | |
| | Understand and convey intended meaning | |
| | Participate in variety of workplace discussions | |
| | Comply with organization requirements for the use of | |
| | written and electronic communication methods | |
| Resources | The following resources must be provided: variety of | |
| Implication | information, communication tools, simulated workplace | |
| Methods of | Competence may be assessed through: | |
| Assessment | Interview / Oral Questioning | |
| | Observation/Demonstration | |
| Context of | Competence may be assessed in the workplace or in a | |
| Assessment | simulated workplace setting | |

| Page 55 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level III | | |
|---|---|--|
| Unit Title | Lead Small Teams | |
| Unit Code | EIS TIM3 15 0612 | |
| Unit Descriptor | This unit covers the knowledge, attitudes and skills to lead small teams including setting and maintaining team and individual performance standards. | |

| Elements | Performance Criteria | |
|--------------------------------------|---|--|
| 1. Provide team leadership | 1.1 <i>Work requirements</i> are identified and presented to team members | |
| | 1.2 Reasons for instructions and requirements are communicated to team members | |
| | 1.3 <i>Team members' queries and concerns</i> are recognized, discussed and dealt with | |
| 2. Assign responsibilities | 2.1 Duties and responsibilities are allocated having regard to the skills, knowledge and aptitude required to properly undertake the assigned task and according to company policy | |
| | 2.2 Duties are allocated having regard to individual preference, domestic and personal considerations, whenever possible | |
| 3. Set performance | 3.1 Performance expectations are established based on client needs and according to assignment requirements | |
| expectations for team members | 3.2 Performance expectations are based on individual team members duties and area of responsibility | |
| | 3.3 Performance expectations are discussed and disseminated to individual team members | |
| 4. Supervised team performance | 4.1 <i>Monitoring of performance</i> takes place against defined performance criteria and/or assignment instructions and corrective action taken if required | |
| | 4.2 Team members are provided with <i>feedback</i> , positive support and advice on strategies to overcome any deficiencies | |
| | 4.3 Performance issues which cannot be rectified or addressed within the team are referenced to appropriate personnel according to employer policy | |
| | 4.4 Team members are kept informed of any changes in the priority allocated to assignments or tasks which might impact on client/customer needs and satisfaction | |
| | 4.5 Team operations are monitored to ensure that employer/ | |

| Page 56 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| client needs and requirements are met |
|---|
| 4.6 Follow-up communication is provided on all issues affecting the team |
| 4.7 All relevant documentation is completed in accordance with company procedures |

| Variable | Range |
|---------------|--------------------------------------|
| Work | client profile |
| requirements | assignment instructions |
| Team member's | • roster/shift details |
| concerns | |
| Monitor | formal process |
| performance | informal process |
| Feedback | formal process |
| | informal process |

| Evidence Guide | |
|--|---|
| Critical Aspects of Competence | Assessment requires evidence that the candidate: maintained or improved individuals and/or team performance given a variety of possible scenario assessed and monitored team and individual performance against set criteria represented concerns of a team and individual to next level of management or appropriate specialist and to negotiate on their behalf allocated duties and responsibilities, having regard to individual's knowledge, skills and aptitude and the needs of the tasks to be performed set and communicated performance expectations for a range of tasks and duties within the team and provided feedback to team members |
| Underpinning Knowledge and Attitudes | Demonstrates knowledge of maintaining or improving individuals and/or team performance given a variety of possible scenario assessing and monitoring team and individual performance against set criteria representing concerns of a team and individual to next level of management or appropriate specialist and to negotiate on their behalf allocating duties and responsibilities, having regard to individual's knowledge, skills and aptitude and the needs of the tasks to be performed setting and communicating performance expectations for a range of tasks and duties within the team and providing feedback to team members |

| Page 57 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| Underpinning Skills | communication skills required for leading teams informal performance counseling skills team building skills negotiating skills |
|--------------------------|--|
| Resource Implications | access to relevant workplace or appropriately simulated environment where assessment can take place materials relevant to the proposed activity or task |
| Methods of | Competence may be assessed through: |
| Assessment | Interview / Oral questioning / Written Test |
| | Observation/Demonstration |
| Context of | Competence may be assessed individually in the actual |
| Assessment | workplace or through accredited institution |

| Page 58 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level III | | |
|---|--|--|
| Unit Title | Improve Business Practice | |
| Unit Code | EIS TIM3 16 0612 | |
| Unit Descriptor | This unit covers the skills, knowledge and attitudes required in promoting, improving and growing business operations. | |

| Elements | Per | formance Criteria | | |
|---------------------------------|-----|--|--|--|
| 1. Diagnose the | 1.1 | Data required for diagnosis is determined and acquired | | |
| business | 1.2 | <i>Competitive advantage</i> of the business is determined from the data | | |
| | 1.3 | SWOT analysis of the data is undertaken | | |
| 2. Benchmark | 2.1 | Sources of relevant benchmarking data are identified | | |
| the business | 2.2 | Key indicators for benchmarking are selected in consultation with key stakeholders | | |
| | 2.3 | Like indicators of own practice are compared with benchmark indicators | | |
| | 2.4 | Areas for improvement are identified | | |
| 3. Develop | 3.1 | A consolidated list of required improvements is developed | | |
| plans to improve business | 3.2 | Cost-benefit ratios for required improvements are determined | | |
| performance | 3.3 | Work flow changes resulting from proposed improvements are determined | | |
| | 3.4 | Proposed improvements are ranked according to agreed criteria | | |
| | 3.5 | An action plan to implement the top ranked improvements is developed and agreed | | |
| | 3.6 | Organizational structures are checked to ensure they are suitable | | |
| 4. Develop | 4.1 | The practice vision statement is reviewed | | |
| marketing | 4.2 | Practice objectives are developed/reviewed | | |
| promotional plans | 4.3 | Target markets are identified/refined | | |
| | 4.4 | Market research data is obtained | | |
| | 4.5 | Competitor analysis is obtained | | |
| | 4.6 | Market position is developed/reviewed | | |
| | 4.7 | Practice <i>brand</i> is developed | | |
| | 4.8 | Benefits of practice/practice products/services are | | |

| Page 59 of 165 Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|---|--|------------------------|
|---|--|------------------------|

| | | identified |
|-----------------------------|-----|---|
| | 4.9 | Promotion tools are selected/developed |
| 5. Develop | 5.1 | Plans to increase yield per existing client are developed |
| business growth plans | 5.2 | Plans to add new clients are developed |
| growin plans | 5.3 | Proposed plans are ranked according to agreed criteria |
| | 5.4 | An action plan to implement the top ranked plans is developed and agreed |
| | 5.5 | Practice work practices are reviewed to ensure they support growth plans |
| 6. Implement and monitor | 6.1 | Implementation plan is developed in consultation with all relevant stakeholders |
| plans | 6.2 | Indicators of success of the plan are agreed |
| | 6.3 | Implementation is monitored against agreed indicators |
| | 6.4 | Implementation is adjusted as required |

| Variable | Range | | | | | |
|---|---|--|------------------------|--|--|--|
| Data required includes: | organization c appropriate bu level of client s internal policie staff levels, ca market, market market change market consol revenue level of comm expected reve revenue growt break even da pricing policy revenue assur business envir economic con social factors demographic f technological f political/legisla competitor ma | organization capability appropriate business structure level of client service which can be provided internal policies, procedures and practices staff levels, capabilities and structure market, market definition market changes/market segmentation market consolidation/fragmentation revenue level of commercial activity expected revenue levels, short and long term revenue growth rate break even data pricing policy revenue assumptions business environment economic conditions social factors demographic factors technological impacts political/legislative/regulative impacts competitor marketing/branding competitor products services/products fees | | | | |
| Competitive advantage | services/produ fees | ucts | | | | |
| Page 60 of 165 Ministry of Education Copyright | | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 | | | |

| includes: | location | | | | | |
|-----------------|--|---|------------|--|--|--|
| | timeframe | | | | | |
| Objectives | Specific | Specific | | | | |
| should be | Measurable | Measurable | | | | |
| 'SMARI', that | Achievable | Achievable | | | | |
| | Realistic | | | | | |
| | Time defined | Time defined | | | | |
| Market research | data about ex | isting clients | | | | |
| data includes: | data about po | ossible new clients | | | | |
| | data from inte | ernal sources | | | | |
| | data from extension | ernal sources such as: | | | | |
| | trade associa | tions/journals | | | | |
| | Yellow Pages | small business surveys | | | | |
| | Internet | | | | | |
| | Internet Chamber of C | `ammaraa | | | | |
| | Chamber of C | Johnnerce | | | | |
| | Client Surveys industry roport | te | | | | |
| | Industry report secondary matrix | is arket research | | | | |
| | secondary mark primary mark | et research such as: | | | | |
| | telephone | primary market research such as: telephone surveys | | | | |
| | personal i | personal interviews | | | | |
| | mail surve | VS | | | | |
| Competitor | competitor off | erings | | | | |
| analysis | competitor pre- | omotion strategies and activities | | | | |
| | competitor pressure | ofile in the market place | | | | |
| SWOT analysis | internal streng | gths such as staff capability, recogr | nized | | | |
| includes: | quality | • quality | | | | |
| | internal weaknesses such as poor morale, | | | | | |
| | under-capitalization, poor technology | | | | | |
| | external opportunities such as changing market and | | | | | |
| | economic conditions | | | | | |
| | external threa | its such as industry fee structures, s | strategic | | | |
| Kov indicators | alliances, con | | | | | |
| may include: | salary cost ar porsonnol pro | la statting | | | | |
| may morado. | personner pro profitability | ductivity (particularly of principals) | | | | |
| | fee structure | | | | | |
| | client base | | | | | |
| | size staff/prin | cipal | | | | |
| | overhead/over | rhead control | | | | |
| Organizational | legal structure | e (partnership, limited liability compa | any, etc.) | | | |
| structures | organizationa | I structure/hierarchy | . , | | | |
| include: | reward schen | reward schemes | | | | |
| Market position | product | product | | | | |
| should | the good or set | ervice provided | | | | |
| | Ministry of Education | Power Transmission Systems | Vorsion 4 | | | |
| Page 61 of 165 | Copyright | Installation and Maintenance | June 2012 | | | |
| | 17.5 | Ethiopia Occupational Standard | - | | | |

| include data on: | product mix |
|--------------------|---|
| | the core product - what is bought |
| | the tangible product - what is perceived |
| | the augmented product - total package of consumer |
| | features/benefits |
| | product differentiation from competitive products |
| | new/changed products |
| | price and pricing strategies (cost plus, supply/demand. |
| | ability to pay, etc.) |
| | pricing objectives (profit, market penetration, etc.) |
| | cost components |
| | market position |
| | distribution strategies |
| | marketing channels |
| | promotion |
| | promotional strategies |
| | target audience |
| | communication |
| | promotion budget |
| Practice brand | practice image |
| may | practice logo/letter head/signage |
| include: | phone answering protocol |
| | facility decor |
| | • slogans |
| | templates for communication/invoicing |
| | style guide |
| | writing style |
| | AIDA (attention, interest, desire, action) |
| Benefits may | features as perceived by the client |
| include: | benefits as perceived by the client |
| Promotion tools | networking and referrals |
| include: | seminars |
| | advertising |
| | press releases |
| | publicity and sponsorship |
| | brochures |
| | newsletters (print and/or electronic) |
| | websites |
| | direct mail |
| | telemarketing/cold calling |
| Yield per existing | raising charge out rates/fees |
| client may be | packaging fees |
| increased by: | reduce discounts |
| | sell more services to existing clients |

| Page 62 of 165 Ministry of Education Power Copyright Ethiop | Transmission Systems lation and Maintenance a Occupational Standard Version 1 June 2012 |
|--|---|
|--|---|

| Evidence Guide | | | | | |
|--|---|---|---|--|--|
| Critical Aspects of Competence | The candidate must be able to demonstrate: ability to identify the key indicators of business performance ability to identify the key market data for the business knowledge of a wide range of available information sources ability to acquire information not readily available within a business ability to analyze data and determine areas of improvement ability to negotiate required improvements to ensure implementation ability to evaluate systems against practice requirements and form recommendations and/or make recommendations ability to assess the accuracy and relevance of information | | | | |
| Underpinning Knowledge and Attitudes | Demonstrates kn data analysis communicatio computer skill negotiation sk planning skills marketing prir ability to acqu current produc use of market development and growth pl | owledge of: on skills ls to manipulate data and present in cills and problem solving s nciples ire and interpret relevant data ct and marketing mix intelligence and implementation strategies of pr ans | nformation | | |
| Underpinning Skills | Demonstrates sk analysis and r ability to acquer practice syster benchmarking applying methindicators communication working and of for the busing planning skills using computer information | ill in: manipulation of data ire and interpret required data, curr ms and structures and sources of r data nods of selecting relevant key benc on skills consulting with others when develop ess s, negotiation skills and problem so ers to manipulate, present and dist | rent relevant hmarking bing plans lving ribute | | |
| Resources Implication | Access is require including work an information on wo | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. | | | |
| Methods of Assessment | Competence may be assessed through: Interview / Written Test Observation / Demonstration with Oral Questioning | | | | |
| Context of | Competence may | y be assessed in the workplace or i | na | | |
| Page 63 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 | | |

| Assessment | simulated workplace setting |
|------------|-----------------------------|

NTQF Level IV

| on Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|---|---|
| tio | tion Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard |

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | | | |
|--|---|--|--|
| Unit Title | Apply Environment and Sustainable Energy Procedures | | |
| Unit Code | EIS TIM4 01 0612 | | |
| Unit Descriptor | This competence standard unit covers the implementation of relevant environmental procedures to specific projects/sites. It includes the identification of possible environmental risks and impacts, the undertaking of work in accordance with sustainable energy and energy conservation principles, the provision of re-cycling materials and the recording and reporting of environmental incidents. It also encompasses the process of reviewing and participating and contributing in environmental procedures according to established enterprise requirements. | | |

| Elements Performance Criteria | | | | |
|--|--|---|---|---|
| 1. Prepare to implement environmental and | 1.1 al | Works sch requiremer lists, are re necessary | edule(s), including drawings, plans nts, established procedures, and m eceived, analyzed and confirmed, , by site inspection. | s, naterial if |
| sustainable energy | 1.2 | Relevant re the work a identified fe | equirements and established proce re communicated to all personnel a or all work <i>sites.</i> | edures for and |
| | 1.3 | OHS polici and establ environme obtained a be perform | es and procedures related to requisible and procedures for the implement of the implement of and sustainable energy proced and confirmed for the purposes of the dand communicated. | irements ntation of dures are ne work to |
| | 1.4 | .4 Environmental and sustainable energy procedures ar identified, prioritized and combined within relevant projects, following consultation with others for completion within acceptable timeframes and in accordance with established procedures. | | edures are evant r I in |
| | 1.5 | Hazards an measures including e established | re identified, OHS risks assessed a are prioritized, implemented and m mergency exits kept clear accordin d procedures. | and control nonitored ng to |
| | 1.6 | Relevant w perform wo sustainable establishee | vork permits are obtained to access ork according to environmental and e energy procedures, requirements d procedures. | s and I s and/or |
| Page 65 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersio June 2 | | Version 1 June 2012 | |

| | | 1.7 | Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order. |
|---|--|--|--|
| | | 1.8 | Relevant personnel at worksite are confirmed current in environmental and sustainable energy procedures and other related work procedures according to requirements. |
| | | 1.9 | Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary. |
| | | 1.10 | Site is prepared according to the work schedule, taking into account environmental and sustainable energy procedures and the need to minimize risk and damage to property, commerce, and individuals in accordance with established procedures. |
| | | 1.11 | Personnel participating in the work, including plant operators and contractors, are fully briefed on environmental and sustainable energy procedures and respective responsibilities confirmed where applicable in accordance with established procedures. |
| 2. Carry out environmental and sustainable energy procedures | Carry out environmental and sustainable | 2.1 | OHS and sustainable energy principles and practices to reduce the <i>incidents</i> of accidents and minimize waste are monitored and followed in accordance with requirements and/or established procedures. |
| | 2.2 | Use of power tools/equipment, techniques and practices are safely followed under environmental and sustainable energy procedures and, currency according to requirements confirmed. | |
| | | 2.3 | Essential knowledge and associated skills are applied in the safe implementation of environmental and sustainable energy procedures to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements. |
| | | 2.4 | Relevant environmental procedures are applied to a specific project(s)/site(s). |
| | | 2.5 | Work is conducted in accordance with the principles of sustainable energy and energy conservation. |
| | | 2.6 | Provision for the re-cycling or re-use of materials is undertaken where possible. |
| | | 2.7 | Hazard warnings and safety signs are recognized and hazards and assessed OHS <i>risks</i> are reported to the immediate authorized persons for directions according to established procedures. |

| Page 66 of 165 Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|---|--|------------------------|
|---|--|------------------------|

| | | 2.8 | Unplanned events in the implementation of environmental and sustainable energy procedures are undertaken within the scope of established procedures. |
|----|---|------|---|
| | | 2.9 | Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills on environmental and sustainable energy procedures. |
| | | 2.10 | Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures. |
| 3. | Complete the environmental and sustainable | 3.1 | Work undertaken is checked against works schedule for conformance with requirements and environmental and sustainable energy procedures and, anomalies reported in accordance with established procedures. |
| | energy procedures | 3.2 | Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable. |
| | | 3.3 | Work site is rehabilitated, cleaned up and made safe in accordance with environmental and sustainable energy procedures as well as other established procedures. |
| | | 3.4 | Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with environmental and sustainable energy procedures as well as other established procedures. |
| | | 3.5 | Relevant work permit(s) are signed off and, environmental risks/incidents and potential impacts are reported and recorded according to requirements/established procedures. |
| | | 3.6 | Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified. |

| Variable | Range |
|------------------------|--|
| Environmental risks | may include: impact of mismanagement of chemicals impact of mismanagement of biological agents detrimental impact on limited water resources spillage waste disposal detrimental impact on water catchment areas (urban and non-urban) |

| Page 67 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| | detrimental impact on rivers | | | | |
|--------------------|--|--|--|--|--|
| | waterways and channels | | | | |
| | unsatisfactory trade waste treatment | | | | |
| | and disposal processes | | | | |
| | poor construction processes | | | | |
| | planning deficiencies | | | | |
| | plaining denderings neglect of sustainable energy principles | | | | |
| Environmental | May include: | | | | |
| legislation | relevant federal legislation | | | | |
| logiciation | relevant local government by-laws | | | | |
| | relevant local government or quasi government policies and | | | | |
| | regulations | | | | |
| | relevant community planning and development | | | | |
| | agreements (e.g. land care agreements) | | | | |
| Environmental | May include: | | | | |
| management | information on applicable environmental laws or other | | | | |
| documentation | requirements | | | | |
| accumentation | complaint records | | | | |
| | training records | | | | |
| | process information | | | | |
| | process information process operational log books | | | | |
| | process operational log books inspection | | | | |
| | maintenance and calibration records | | | | |
| | Indimenance and calibration records rolevant contractor and supplier information | | | | |
| | incident reports | | | | |
| | Incident reports information on americanous proported noos and reasonable | | | | |
| | Information on emergency preparedness and response reporte of significant environmental impacts | | | | |
| | records of significant environmental impacts abain of quotedy and compliance records | | | | |
| | Chain of custody and compliance records | | | | |
| | • audit results | | | | |
| Incidente of | Management reviews | | | | |
| | May include. | | | | |
| import | emissions to all | | | | |
| Impact | releases to land | | | | |
| | releases to land wibrotion and point | | | | |
| | Vibration and noise | | | | |
| | disposal of waste contamination of land | | | | |
| | contamination of land | | | | |
| | Impact on communities | | | | |
| | destruction of habitat | | | | |
| | use of energy sources | | | | |
| | waste generation processes and technologies | | | | |
| | Impact on culturally significant sites | | | | |
| On a alfi - | may involve the implementation of emergency responses | | | | |
| | may include, but is not limited to: | | | | |
| project(s)/site(s) | buildings | | | | |
| | plants construction and maintenance sites | | | | |
| | Workshops | | | | |
| Page 68 of 165 | Ministry of Education Power Transmission Systems Version 1 | | | | |
| 1 490 00 01 100 | Copyright Ethiopia Occupational Standard June 2012 | | | | |

| | laboratories |
|--------------------|---|
| | catchments |
| | flood plains irrigation sites |
| | wetlands |
| | drainage sites |
| | waste disposal sites |
| | easements |
| The following | Appropriate and relevant persons (see Personnel) |
| constants and | Appropriate authorities |
| variables included | Assessing risk |
| in this unit: | Assessment |
| | Authorization |
| | Diagnostic, testing and restoration |
| | Documenting detail work events, record keeping and or |
| | storage of information |
| | Drawings and specifications |
| | Emergency |
| | Environmental and sustainable energy procedures |
| | Environmental legislation |
| | Environmental management documentation |
| | Established procedures |
| | Fall prevention |
| | Hazards |
| | Identifying hazards |
| | Inspect |
| | Legislation |
| | MSDS |
| | Notification |
| | OHS practices |
| | OHS issues |
| | Permits and/or permits to work |
| | Personnel |
| | Quality assurance systems |
| | Requirements |
| | Testing procedures |
| | Work clearance systems |

| Evidence Guide | | | | |
|---------------------|--|--|--|--|
| Critical Aspects of | Assessment requires evidence that the candidate: | | | |
| Competence | Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures | | | |
| | Apply sustainable energy principles and practices | | | |
| | Conduct work observing the relevant legislation, regulations, policies and workplace procedures | | | |

| Page 69 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| Underpinning | Demonstrates knowledge to: | | | |
|---------------|---|--|--|--|
| Knowledge and | • applying environmental and sustainable energy procedures | | | |
| Attitudes | Occupational Health and Safety principles | | | |
| | Environmental Fundamentals | | | |
| Underpinning | Demonstrates skills to: | | | |
| Skills | Material handling and the environment | | | |
| | Filtering and sampling oil and the environment | | | |
| | Enterprise specific - OHS instructions | | | |
| Resources | Access is required to real or appropriately simulated situations, | | | |
| Implication | including work areas, materials and equipment, and to | | | |
| | information on workplace practices and OHS practices. | | | |
| Methods of | Competence may be assessed through: | | | |
| Assessment | Interview / Written Test | | | |
| | Observation / Demonstration with Oral Questioning | | | |
| Context of | Competence may be assessed in the work place or in a | | | |
| Assessment | simulated work place setting. | | | |

| Page 70 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | | | | |
|--|---|--|--|--|
| Unit Title | Operate Plant and Equipment near Live Electrical Conductors/Apparatus | | | |
| Unit Code | EIS TIM4 02 0612 | | | |
| Unit Descriptor | This competence standard unit covers the safe operation and maintenance of plant and equipment near live electrical conductors and/or apparatus. It encompasses plant and equipment relevant to the enterprise and is in addition to any local government legislation and or regulatory requirements regarding the operation of that plant and or equipment. It includes the conducting of operational checks, the correct positioning of road signs, barriers and or warning devices. It also encompasses the completion of log books and job completion documentation. | | | |

| Elements | Performance Criteria | | |
|---|----------------------|---|--|
| Prepare to operate plant and equipment near energized | 1.1 | Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection. | |
| and exposed electrical conductors/ap paratus | 1.2 | Relevant requirements and established procedures for the operation of plant and equipment near energized and exposed electrical conductors/apparatus are communicated to all personnel and identified for all work sites. | |
| | 1.3 | OHS policies and procedures related to requirements and established procedures for the operation of plant and equipment near energized and exposed electrical conductors/apparatus are obtained and confirmed for the purposes of the work to be performed and communicated. | |
| | 1.4 | Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures. | |
| | 1.5 | Hazards are identified, OHS risks assessed and control measures are prioritized, implemented and monitored including emergency exits kept clear according to established procedures. | |
| | 1.6 | Relevant work permits are obtained to access and perform work according to requirements and/or established procedures. | |

| Page 71 of 165 | stry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|--------------------------------|--|------------------------|
|----------------|--------------------------------|--|------------------------|
| | | 1.7 | Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order. |
|----|--|------|---|
| | | 1.8 | Relevant personnel at worksite are confirmed current in First Aid, Pole Top Rescue and other related work procedures according to requirements. |
| | | 1.9 | Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary. |
| | | 1.10 | Site is prepared according to the work schedule and to minimize risk and damage to property, commerce, and individuals in accordance with established procedures. |
| | | 1.11 | Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures. |
| | | 1.12 | Road signs, barriers and warning devices are positioned in accordance with requirements. |
| 2. | Carry out the operation of plant and equipment near energized and exposed electrical conductors/ap paratus | 2.1 | OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimize waste are monitored and followed in accordance with requirements and/or established procedures. |
| | | 2.2 | Lifting, climbing, working in confined spaces and aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed. |
| | | 2.3 | Apply essential knowledge and associated skills in the safe operation of plant and equipment near energized and exposed electrical conductors/apparatus to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements. |
| | | 2.4 | Plant and equipment are safely operated near energized and exposed electrical conductors/apparatus according to requirements and established procedures. |
| | | 2.5 | Hazard warnings and safety signs are recognized and hazards and assessed OHS risks are reported to the immediate authorized persons for directions according to established procedures. |
| | | 2.6 | Unplanned events in the operation of plant and equipment near energized and exposed electrical conductors/apparatus are undertaken within the scope of established procedures. |

| Page 72 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| | | 2.7 | Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills. |
|----|--|-----|---|
| | | 2.8 | Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures. |
| 3. | Complete the operation of plant and equipment near energized and exposed electrical conductors/ apparatus. | 3.1 | Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures. |
| | | 3.2 | Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable. |
| | | 3.3 | Work site is rehabilitated, cleaned up and made safe in accordance with established procedures. |
| | | 3.4 | Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures. |
| | | 3.5 | Relevant work permit(s) are signed off and, <i>plant</i> and equipment are checked, returned to service/stored appropriately, in accordance with requirements and established procedures. |
| | | 3.6 | Works completion records, reports, as installed/modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified. |

| Variable | Range |
|---------------|--|
| Equipment | May include:hand operated ratchet and friction grip winches |
| | chain pullers |
| | block and tackle |
| Support plant | May include: |
| | elevating work platform |
| | back hoes |
| | earth drilling rigs |
| | trench excavators |
| | heavy vehicles |
| | concrete cutters |
| | compressors |
| | portable generators |
| | welders |
| | crimper-cutters |

| Page 73 of 165 Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|---|--|------------------------|
|---|--|------------------------|

| | chain-saws |
|--------------------|--|
| | iack-hammers |
| | post hole diagers |
| | sand-blasters |
| | |
| | self-loading vehicle |
| The following | Appropriate and relevant persons (see Personnel) |
| constants and | Appropriate authorities |
| variables included | |
| in this unit: | |
| | |
| | Diagnostic testing and restoration |
| | Diagnostic, testing and restoration Decumenting detail work events, record keeping and er |
| | • Documenting detail work events, record keeping and or storage of information |
| | Drawings and specifications |
| | |
| | Environmental and sustainable energy precedures |
| | Environmental logicletion |
| | Environmental registration |
| | Environmental management documentation |
| | Established procedures |
| | Fail prevention |
| | Hazards |
| | Identifying nazards |
| | Inspect |
| | |
| | • MSDS |
| | Notification |
| | OHS practices |
| | • OHS issues |
| | Permits and/or permits to work |
| | Personnel |
| | Quality assurance systems |
| | Requirements |
| | Testing procedures |
| | Work clearance systems |

| Evidence Guide | | | | | | | | |
|--------------------------------|---|---|---|--|--|--|--|--|
| Critical Aspects Competence | of Assessment req Implement C procedures a measures Apply sustain Conduct we regulations, p | uires evidence that the candidate: Dccupational Health and Safety and practices including the use of nable energy principles and practice ork observing the relevant policies and workplace procedures | workplace risk control es legislation, | | | | | |
| Underpinning | Demonstrates kr | nowledge to: | | | | | | |
| Page 74 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 | | | | | |

| Knowledge and | Basic electrical principles |
|---------------|---|
| Attitudes | Magnetism |
| | Electromagnetic principles |
| | Electro technology science and materials |
| | Hand tools |
| | Power tools |
| | Occupational Health and Safety principles |
| | Electrical safe working practice |
| | Engineering applications of mathematical principles |
| | Engineering applications of mechanical principles |
| | Engineering applications of material properties |
| | Elevating work platform operational principles |
| | Hydraulic and pneumatic portable equipment |
| | Enterprise vehicles |
| | Chain saw principles |
| | Condition power systems |
| | Generation power systems Environmental fundamentals |
| | Environmental fundamentals Motorial bandling and the environment |
| | Material handling and the environment Enterprise encoding induced procedure instructions |
| Underninning | Enterprise specific - policy and procedure instructions |
| Skille | Demonstrates skills to. |
| OKIIIS | Basic electrical practices Mognotism |
| | |
| | Electromagnetic practices |
| | Electro technology science and materials |
| | Hand tools |
| | Power tools |
| | Occupational health and safety practices |
| | Electrical safe working practice |
| | Engineering applications of mathematical principles |
| | Engineering applications of mechanical principles |
| | Engineering applications of material properties |
| | Elevating work platform operational practices |
| | Hydraulic and pneumatic portable equipment |
| | Enterprise vehicles |
| | Chain saw practices |
| | Generation power systems |
| Resources | Access is required to real or appropriately simulated |
| Implication | situations, including work areas, materials and equipment, and |
| Matha da af | to information on workplace practices and OHS practices. |
| Methods of | Competence may be assessed through: |
| Assessment | Interview / vvritten 1 est Observation / Demonstration _ itle Oct O _ outing in |
| Contout of | Observation / Demonstration with Oral Questioning |
| | Competence may be assessed in the work place or in a |
| Assessment | simulated work place setting. |

| Page 75 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | | | | | |
|--|--|--|--|--|--|
| Unit Title | Work Safely near Live Electrical Apparatus as Non- Electrical Worker | | | | |
| Unit Code | EIS TIM4 03 0612 | | | | |
| Unit Descriptor | This unit covers compliance with working safely up to the defined "safe approach distance" near energized electrical apparatus (including electrical power lines) for non-electrical worker. It includes work functions that may be performed, such as vegetation control, scaffolding, rigging, painting, and/or any other activity that requires working safely and complying with requirements and/or established procedures near live electrical apparatus by a non-electrical worker. Also included is the preparation of risk assessment control measures that encompass job safety assessment. It does not include any work that is or may be performed by other competent operatives within the defined "safe working zone". The defined "safe working zone" is that so defined by relevant regulatory agencies/bodies, local government legislation, Industry bi-partite body – Guidelines/ Codes of Practices or other related requirements for Safe work and access near live electrical apparatus. | | | | |

| Elements | | Performance Criteria | | | |
|---|---|----------------------|--|--|-------------------------|
| 1. Prepare to work safely near live | , | 1.1 | Instructio near live are receiv | ns related to the work to be perforn electrical apparatus as non-electric ved and confirmed. | ned safely al worker |
| electrical apparatus as nonelectrical worker | 6 | 1.2 | Relevant be followe communi identified | requirements and established proc ed and, relevant personnel to be cated with for the work to be perfor | edures to med are |
| | | 1.3 | OHS policies and procedures to be followed for the work to be performed are received and confirmed. | | |
| | | 1.4 | Suggestic requirement as a non- in the wo | ons to assist in meeting the safety ents for working near live electrical electrical worker are made to other rk. | apparatus s involved |
| | | 1.5 | Hazards control m monitored according | are identified, OHS risks assessed easures are prioritized, implemente d including emergency exits kept cl g to established procedures. | and ed and ear |
| | 1.6 Scope of responsibility and process of relevant wor | | | ant work | |
| Page 76 of 165 | Mini | istry of Copy | Education rright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |

| | | | permit(s) according | issue is identified, received and co g to requirements and established p | nfirmed procedures. |
|---|--|--------------------|---|--|--|
| | | 1.7 | Relevant Observer at the wo requirem safety me incident. | responsibility associated with First is and/or other related work safety p rksite are identified in accordance w ents and established procedures to easures are followed in the instance | Aid, Safety procedures with ensure e of an |
| | | 1.8 | Processe appropria industry/a identified | es for identifying and reporting client ate personnel in accordance with acceptable /community standards a | t issues to re |
| | | 1.9 | Site and confirmed outcome commerce establishe | the work schedule to be prepared a d according to given instructions for and to minimize risk and damage to e, stock and individuals in accordance ed procedures. | re a quality o property, nce and |
| | | 1.10 | Electricity requirem apparatu | infrastructure assets, related volta ents for working safely near live ele s as non-electrical worker are ident | ges and ctrical ified. |
| | | 1.11 | Safe app that may requirem intended | roach distances including any zone apply, as defined in industry guidel ents and/or established procedures work are confirmed. | s thereof ines, for the |
| 2. | Carry out th work safely near live electrical | ne 2.1 | OHS prin accidents instructio procedur | ciples and practices to reduce the i are identified in accordance with g ns, requirements and/or established es. | ncidents of iven d |
| | apparatus as non- electrical worker. | as 2.2 | Working requirem as a non- with given routines/ | safely and complying with all safety ents for working near live electrical electrical worker are followed in ac n instructions and established procedures. | apparatus cordance |
| | | 2.3 | Processes for monitoring and reporting/referring hazards and OHS risks to the immediate authorized personnel for directions according to established procedures are followed. | | |
| | | 2.4 | Non-routine events are referred to the immediate authorized personnel for directions according to established procedures. | | |
| | | 2.5 | Unexpect live electric responder related to instructio | ted events associated with working rical apparatus as a non-electrical v ed to using acquired known solution o routine procedures to ensure work ns and established procedures are | safely near vorker are s and skills met. |
| Page 77 of 165 Ministry of Education Copyright | | Education right | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 | |

| 3. | Complete the work safely near | 3.1 | Work schedule and anomalies for completion and checking of the work are reported to authorized personnel in accordance with established procedures. |
|----|---|-----|---|
| | live electrical apparatus as pop- | 3.2 | Processes for reporting to authorized personnel accidents and/or incidents are confirmed in accordance with established procedures. |
| | electrical worker. | 3.3 | Requirements for returning work permit(s) and/or access Authorization permits are confirmed. |
| | | 3.4 | Appropriate personnel are notified of work completion according to established procedures. |
| | | 3.5 | Works completion records, report forms/data sheets are completed accurately in accordance with given instructions and established procedures. |

| Variable | Range | |
|--|---|--|
| This unit shall/may be demonstrated in relation to: | safe working so defined by relevant regulatory agencies/bodies, local government legislation, Industry bi-partite body – Guidelines/Codes of Practices or other related requirements for safe work and access near live electrical apparatus. Work functions that may be performed, such as: vegetation control operation of cranes elevating work platforms excavators concrete pumps etc. scaffolding rigging painting, and/or any other activity that requires working safely and complying with requirements and/or established procedures near live electrical apparatus by a non- electrical worker/ | |
| | Working safely up to the defined "safe working zone" near energized electrical apparatus (including electrical power lines) for non-electrical worker including an understanding of risk assessment control measures that encompass job safety assessment but excluding any work that is or may be performed by other competent operatives within the defined "safe working zone". Safe use of plant, equipment and tools within electrical environments including but not limited by: the electricity supply infrastructure assets, infrastructure constructions and excavations including | |

| Page 78 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| | an understanding of safe approach distances zones/safe working clearance work permit(s) and/or access authorization permits technical standards and industry guidelines rural applications road construction pavements and effect of inclement weather |
|---|--|
| The following constants and variables included in this unit: | Appropriate and relevant persons Appropriate authorities Assessing risk Authorization Drawings and specifications Emergency Established procedures Hazards Identifying hazards Legislation Notification OHS practices OHS issues Permits and/or permits to work Work clearance systems |

| Evidence Guide | | |
|--|---|--|
| Critical Aspects of Competence Implement occupational health and safety workplace procedures and practices including the use of risk con measures Apply sustainable energy principles and practices Conduct work observing the relevant legislation, regulations, policies and workplace procedures | | |
| Underpinning Knowledge and Attitudes | regulations, policies and workplace procedures Demonstrates knowledge of: Basic electrical principles Evidence shall show an understanding of electrical principle to an extent indicated by the following aspects: Nature of electrical current and charge Sources of electricity Effects of current Single-source single-load circuits encompassing: components that make up the circuit, and relationship between voltage and current Consequences of short-circuit and an open-circuit Occupational Health and Safety principles Evidence shall show an understanding of occupational health and safety to an extent indicated by the following aspects | |
| Page 79 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | |

| | The basic legal requirements covering occupational health | | |
|---|---|--|--|
| | and safety in the workplace encompassing. | | |
| | general aims and objectives of the relevant state or | | |
| | territory legislation relating to OHS | | |
| | employer and employee responsibilities, rights and | | |
| | obligations | | |
| | major functions of safety committees and | | |
| | representatives | | |
| | powers give to Occupational Health and Safety | | |
| | Inspectors | | |
| | The requirements for personal safety in the workplace | | |
| | encompassing: | | |
| | the safety precautions that are required to ensure | | |
| | personal salety in the workplace | | |
| | potential nazards in relation to improper industrial bousekeeping | | |
| | sources of pollution in an engineering environment and | | |
| | outline control measures | | |
| | Workplace safety check, identifying potential workplace | | |
| | hazards and suggested measures for accident prevention | | |
| | encompassing: | | |
| | safety checklist for a typical workplace environment | | |
| | identifying and reporting potential workplace hazards | | |
| | methods of prevention of safety hazards within a typical | | |
| | workplace environment | | |
| working safely with electrical tools or equipment | | | |
| | encompassing: | | |
| | causes of electrical accidents and state the effects that | | |
| | electric shock can cause | | |
| | purpose of circuit protection devices, such as ruses, circuit breakers and Residual | | |
| | Current Devices (RCDs) | | |
| | safe isolation of an electrical supply | | |
| | emergency procedures for the rescue of an electric shock | | |
| | victim equipment | | |
| emergency First Aid for an electric shock victim | | | |
| Note: Emergency first aid is limited to first-on-the scene | | | |
| | assistance to a victim of electric shock, and basics of CPR | | |
| | Electrical safe working practice | | |
| | Evidence shall show an understanding of working safely on or | | |
| | around electrical equipment through the application of risk | | |
| | management principles and control measures for dealing | | |
| | with non-electrical hazards and extra-low voltage, low-voltage | | |
| | and high-voltage hazards and high-current hazards. The following aspects indicate the extent of understanding | | |
| | required. | | |
| | Risk management and assessment of risk encompassing:. | | |
| | Ministry of Education Power Transmission Systems Version 1 | | |
| Page 80 of 165 | Copyright Installation and Maintenance June 2012 | | |
| | | | |

| | Principle and | d purpose of risk management | | | | |
|---|---|---|--------------|--|--|--|
| | Processes f | or conducting a risk assessment | | | | |
| | Hazards associ | ated with low-voltage, extra-low | voltage | | | |
| | and high-currer | its encompassing: | | | | |
| | Arrangement of electrical install | ^t power distribution and circuits in ations | n an | | | |
| | Parts of an electronic low-voltage and | trical system and equipment that extra low Voltage | t operate at | | | |
| | Parts of an electronic elect | ctrical system and equipment whe | ere high- | | | |
| | Risks and control r | neasures associated with high-v | oltage | | | |
| | Parts of an electronic bigb-voltage | strical system and equipment that | t operate at | | | |
| | The terms 'touc | h voltage', 'step voltage', 'induce | ed voltage' | | | |
| | and 'creep age' voltage, and | as they relate to the hazards of | high- | | | |
| | Control measur high-voltage. | es used for dealing with the haza | ards of | | | |
| | Optical fiber sa | fety encompassing: | | | | |
| | Coherent op | tical sources and joining proced | ures | | | |
| | Laser safety | class 3a devices or their replac | e | | | |
| | Risks and contr | ol measures associated with low | voltage | | | |
| | encompassing: | | | | | |
| Risks associated with modifying electrical installation | | stallations, | | | | |
| fault finding, maintenance and repair | | | | | | |
| Control measures before, while and after working on electrical installations, circuits or equipment | | | rking on | | | |
| | Isolation and | d tagging-off procedures | | | | |
| | Risks and re | estrictions in working live | | | | |
| | Control mea | isures for working live. | | | | |
| | Risks and contr | Risks and control measures associated with harmful dusts | | | | |
| and airborne contaminants. | | mont | | | | |
| | materials ar | ude inermal insulation, librous ce | forced | | | |
| | switchboard | materials. | orocu | | | |
| | Safety, selectio | n. use. maintenance and care of | test | | | |
| | equipment enco | ompassing: | | | | |
| | Safety chara | acteristics of electrical testing de | vices | | | |
| | Safe use of | electrical testing device | | | | |
| | Checks and | storage methods for maintaining | g the safety | | | |
| | of testing de | evices. | | | | |
| | Transmission, dist | ribution and rail power systems | | | | |
| | Evidence shall sho | w an understanding of transmise | sion, | | | |
| | distribution and rail systems to an extent indicated by the | | by the | | | |
| | tollowing aspects: | , <u>, , , , , , .</u> | | | | |
| Relationship between the transmission, distribution and rai | | tion and rail | | | | |
| | system within a | n overall power system | | | | |
| Page 81 of 165 | Ministry of Education | Power Transmission Systems | Version 1 | | | |
| raye or 01 100 | Copyright | Ethiopia Occupational Standard | June 2012 | | | |

| Note: Examples include different organizations responsible for |
|--|
| generation, transmission, distribution and rail and, how |
| they correlate and their functions |
| Characteristics of a transmission, a distribution and a rail |
| system |
| Note: Examples include principal components, typical voltage |
| levels and methods of transmission and distribution |
| including grid type transmission systems, radial. |
| parallel and ring main feeders |
| Relationship between an overhead and underground |
| supply systems within an overall power system |
| Note: Examples include advantages/disadvantages. |
| applications and the basic steps for planning and |
| installing an overhead and underground distribution |
| system |
| Single line drawings and layouts |
| Only is interviewings and layouts of transmission and |
| distribution systems including, radial, parallel and ring |
| main foodors and the HV equipment associated with |
| substations |
| Fundamentals for working safely near live electrical apparatus |
| Evidence shall show an understanding of working safely up to |
| the defined "safe working zone" near energized electrical |
| apparatus (inc. electrical power lines) for pop-electrical worker |
| to an extent indicated by the following aspects: |
| to all extent indicated by the following aspects. |
| Standards, guidelines/codes of practice, local government logislation, supply authority regulations and or optorprise |
| requirements including relevant certification and licensing |
| applicable to working safely up to the defined "safe |
| working zone" near energized electrical apparatus (inc |
| electrical power lines) for pon-electrical worker |
| Definitions of terminologies |
| Definitions of terminologies Noto: Examples include 'safe working zone' 'risk assessment' |
| 'safe approach distances zones' 'safe working |
| distances' 'work permits' access Authorization permits' |
| 'Technical standards' |
| 'isolation procedures' and compliance requirements' |
| OHS policies and precedures for working sofely |
| • Ons policies and procedures for working salely |
| encompassing. |
| • emergency response and first aid procedures such as |
| UFR released reconcibilities of evenleyers, evenleyers and |
| roles and responsibilities of employees, employees and other portion under the locialation |
| |
| personal protective equipment |
| identifying nazards, assessing and controlling OHS |
| risks |
| tirst aid procedures |
| duties of a safety observer |

| Page 82 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| | working at heights/confined spaces permit to work systems and isolation proced safe application of different types of tools an equipment operation of mobile plant and machinery (e.g near live electrical apparatus Electricity supply infrastructure assets and volta Techniques and precautions in undertaking different functions and working safely up to the defined "s working zone" near energized electrical apparation (including electrical power lines) for non-electric Note: Examples of work functions that may be performed include, vegetation control, scaffolding, rigging and the second sec | ures d g. EWP) ges erent work safe us al worker ormed ng, | |
|---|--|--|--|
| | safely near live electrical apparatus by a nor | n-electrical | |
| painting, and/or any other activity that requires v safely near live electrical apparatus by a non-ele worker Underpinning Demonstrates skills to: Confirmation of the "safe working zone" for safe wor access near live electrical and mechanical apparatu Identification of the relevant technical standards. Act regulations and codes/guidelines Identification of established (enterprise) procedures Confirmation of the principles of electricity, the three power system, electric shock and resuscitation, pow system Recognition of aerial voltage systems Identification of Low Voltage Aerial circuits Identification of high voltage Procedures in the event of an incident Events constituting an incident Procedures for responding to incidents Hazard and risk assessment procedure Confirmation of essential components of hazard assessment checks Apply hazard identification in electrical work Confirmation of the basic safety principles for work Identify electrical works hazard and risk | | work and ratus . Acts, ures hree phase power | |
| Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, | | |
| Methods of Assessment | and to information on workplace practices and OHS practices. Competence may be assessed through: Interview / Written Test Observation / Demonstration with Oral Questioning | | |
| Context of Assessment | Competence may be assessed in the work place or simulated work place setting. | in a | |
| Due og filog Mi | inistry of Education Power Transmission Systems | Version 1 | |

| Page 83 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | | |
|--|--|--|
| Unit Title | Unit Title Implement and Monitor Organizational OHS Policies, Procedures and Programs | |
| Unit Code | EIS TIM4 04 0612 | |
| Unit Descriptor | This covers the implementation and monitoring of the participative arrangements for the management of the Organizational OHS policies procedures, programs and issues, including disseminating information on hazards and risk assessment to meet OHS standards. It also encompasses the collation of work group input, as well as implementation of enterprise procedures for resolving OHS issues. | |

| Elements | Performance Criteria | | | | |
|---|----------------------------------|---|--|---|--|
| 4. Prepare/Plan to implement and monitor the Organizational OHS policies, | 1.1 V re li ir d | Vorks sc equirem sts, are hspectio letermine | chedule(s), including drawings, plans ents, established procedures, and n received, analyzed, if necessary, by n and the extent of the preparation ed for planning and coordination. | s, naterial / site of the work | |
| procedures and programs | 1.2 F th ic | Relevant he work dentified | requirements and established proc are communicated to all personnel for all work sites. | cedures for and | |
| | 1.3 <i>F</i> c n e a | lazards control m nonitore ensure sa according | are identified, OHS risks assessed leasures are prioritized, implemente d including emergency exits kept cle afe systems of work are followed an g to established procedures. | and ed and ear, to ed | |
| | 1.4 V a o a p | Vork is p and effec others for a quality procedure | prioritized and sequenced for the mo stive outcome following consultation r completion within acceptable time standard and in accordance with es es. | ost efficient with frames, to stablished | |
| | 1.5 F ir | Risk control measures are identified, prioritized, implemented and evaluated against the work schedule. | | | |
| | 1.6 F p e | Relevant erforma establish | work permits are secured to coordi nce of work according to requireme ed procedures. | nate the nts and/or | |
| | 1.7 F p ic a | Resources including personnel, equipment, tools an personal protective equipment required for the job a identified, scheduled and coordinated and confirme a safe and technical working order. | | tools and ne job are onfirmed in | |
| | 1.8 C | Clients/C | ustomers are provided with alternat | ive | |
| Page 84 of 165 | linistry of Eo Copyrig | ducation ght | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 | |

| | | methods requireme | within the scope, acceptable cost a ents. | nd |
|---|---------------------|--|--|---|
| | 1.9 | Liaison a other/autl owners a out work. | nd communication issues with horized personnel, authorities, clien re resolved and activities coordinate | ts and land ed to carry |
| | 1.10 | Site is pre minimize and indivi procedure | epared according to the work schec OHS risk, damage to property, con iduals in accordance with establishe es. | lule and to nmerce, ed |
| | 1.11 | Personne operators respective where ap procedure | el participating in the work, including and contractors, are fully briefed a e responsibilities authorized and co plicable in accordance with establis es. | y plant nd ordinated shed |
| | 1.12 | Positionir is planne managen procedure | ng of road signs, barriers and warnind d in accordance with traffic control nent requirements and established es. | ng devices |
| 5. Carry out the implementation and monitoring of the Organizational OHS policies, procedures and programs | 2. 10 | OHS and to reduce waste are with requ | sustainable energy principles and the incidents of accidents and min implemented and monitored in ac irements and/or established proced | practices imize cordance lures. |
| | 2. 11 | First aid, procedur and/or es | pole top rescue and other related ves are performed according to requestablished procedures. | vork irements |
| | 2. 12 | Lifting, cl heights, a and pract requirem | imbing, working in confined spaces and use of power tools/equipment, t tices are safely exercised according ents. | , working at techniques g to |
| | 2. 13 | Hazard w hazards a measures and moni where ne establish | varnings and safety signs are recog and assessed OHS risks are risk co s are implemented, preventative ac tored and/or appropriate authorities cessary, in accordance with require ed procedures. | nized and ontrol tion taken s consulted, ements and |
| | 2. 14 | Remedia encounte requirem | l actions are taken to overcome any red in the work schedule according ents and/or established procedures | y shortfalls to |
| | 2. 15 | Implemen arrangen Organiza issues ar schedule procedur | ntation and monitoring of the partici nents for the systematic manageme tional OHS policy procedures, prog e carried out, in accordance with th and requirements and/or establishe | pative nt of rams and e work ed |
| Page 85 of 165 | Ainistry of Copy | Education right | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |

| | 2. 16 | Essential knowledge and associated skills in the safe implementation and monitoring of the participative arrangements for the management of Organizational OHS policy procedures, programs and issues is applied to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements. |
|---|-------|---|
| | 2. 17 | Solutions to non-routine problems are identified and acted using acquired essential knowledge and associated skills according to requirements. |
| | 2. 18 | On-going checks of quality of the work are undertaken in accordance with requirements and established procedures to ensure a quality outcome is achieved for the client/customer and to a community/industry standard. |
| 6. Complete the implementation and monitoring of the | 3.7 | Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance withestablished procedures. |
| Organizational OHS policies, | 3.8 | Accidents, incidents and/or injuries are reported in accordance with requirements/established procedures. |
| programs | 3.9 | Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures. |
| | 3.10 | Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures. |
| | 3.11 | Relevant work permit(s) are signed off and, the work completed/returned to service and advised to client/customer in accordance with requirements. |
| | 3.12 | Works completion records, reports, as installed / modified drawing(s) and/or documentation and information are confirmed, processed and appropriate personnel notified. |

| Variable | Range |
|---|---|
| In accordance with all relevant OHS legislation, particularly: | general duty of care requirements for maintenance and confidentiality of records of occupational injury and disease provision of information and training regulations and codes of practice relating to hazards present in work area health and safety representatives and OHS committees issue resolution |
| Page 86 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 |

| Hazardous events include: | accidents, fire and emergencies such as chemical spills or bomb scares |
|--|---|
| Procedures for dealing with them include: | evacuation, chemical containment and first aid procedures |
| In accordance with workplace procedures for: | risk assessment and management; inspection housekeeping; participative arrangements, either general or specific to OHS training and assessment specific hazard policies and procedures OHS information OHS record keeping maintenance of plant and equipment purchasing of supplies and equipment and |

| Evidence Guide | |
|--|--|
| 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 Apply sustainable energy principles and practices |
| Underpinning Knowledge and Attitudes | Demonstrates knowledge of: implementing and monitoring the organizational OHS policies, procedures and programs Enterprise specific - policies and procedure instructions Enterprise specific - OHS instructions Enterprise specific - technical drawings and documents |
| Underpinning Skills | Demonstrates skills of: Power line safety - implementation and monitoring Power line safety practices Power line installation safety |
| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. Moreover, access to: a range of emergencies and hazardous events (may be gathered through simulations), document on current OHS Acts, regulations and enterprise OHS policies and procedures personal protective equipment (PPE) |
| Methods of Assessment | Competence may be assessed through: Interview / Written Test Observation / Demonstration with Oral Questioning |
| Context of Assessment | Competence may be assessed in the work place or in a simulated work place setting. |

| Page 87 of 165 | linistry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | | | |
|--|--|--|--|
| Unit Title | Maintain HV Power System Circuit Breakers | | |
| Unit Code | EIS TIM4 05 0612 | | |
| Unit Descriptor | This covers the maintenance of high voltage power system circuit breakers including the diagnosis of faults and the repair and replacement of high voltage power system circuit breakers components in accordance with enterprise requirements. It includes the diagnostic checks, pre- commissioning tests and function checks involving the circuit breakers and their associated control circuits and interpretation of these tests against agreed specifications. | | |

| Ele | ements | Per | formance C | riteria | |
|---|-------------------------------------|--|--|--|---|
| Prepare/plan to maintain High Voltage | n 1.1 e | Work scheo procedures the extent o | dules including drawings, plans, rec and material lists are acquired, an of work determined. | quirements alyzed and | |
| | power syster circuit breakers | ^m 1.2 | Relevant re the work ar identified fo | equirements and established proce e communicated to all personnel a or all work sites. | dures for nd |
| | | 1.3 | Hazards are measures a including er systems of established | e identified, OHS risks assessed at are prioritized, implemented and mo mergency exits kept clear, to ensur work are followed and according to procedures. | nd control onitored re safe |
| | | 1.4 | Work is prid and effective for complet quality stan policies and | pritized and sequenced for the mosive outcome following consultation within acceptable timeframes, to dards and in accordance with estand procedures. | t efficient vith others o agreed blished |
| | | 1.5 | Risk contro | I measures are identified, prioritize ed and evaluated against the work s | d, schedule. |
| | | 1.6 | Resources personal pr identified, a working orc | including personnel, equipment, to otective equipment required for the acquired and confirmed in safe/tech | ols and 9 job are 1nical |
| | | | Liaison issu resolved ar | ues with other personnel and/or aut nd activities coordinated to facilitate | horities are the work. |
| | | 1.8 | Personnel p operators a respective appropriate | participating in the work including p and contractors are fully briefed, the responsibilities explained and coord Authorization checked in accordar | lant eir dinated and nce with |
| Pa | age 88 of 165 | Ministry Co | of Education | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |

| | | | established procedures. |
|----|--|------|--|
| | | 1.9 | Work site is prepared according to the work schedule and to minimize risk and damage to property and personnel in accordance with established procedures. |
| 2. | Carry out maintenance on high voltage | 2. 1 | OHS and sustainable energy principles and practices to reduce the incidence of accidents and minimize waste are implemented and monitored in accordance with established procedures. |
| | power system circuit breakers | 2. 2 | CPR, rescue from live electrical apparatus and other related safety procedures are in place according to requirements and established procedures. |
| | breakers | 2. 3 | Safe working documentation is acquired and requirements completed in accordance with established procedures. |
| | | 2. 4 | Lifting, climbing and working aloft, use of power tools/equipment techniques and practices are safely exercised in accordance with established procedures. |
| | | 2. 5 | Hazard warnings and safety signs are recognized and hazards and assessed OHS risks are reported to the immediate authorized persons for directions according to established procedures. |
| | | 2.6 | Essential knowledge and associated skills for the safe maintenance of HV power system <i>circuit breaker</i> is applied to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements. |
| | | 2. 7 | Maintenance of HV power system <i>circuit</i> breakers is carried out in accordance with the work schedule and requirements and/or established procedures |
| | | 2. 8 | Maintenance of HV power system circuit breakers is completed in an agreed timeframe and to quality standards with a minimum of waste according to requirements. |
| | | 2. 9 | Unplanned events or conditions are responded to in accordance with established procedures. |
| 3. | Complete the maintenance of high | 3.1 | Work undertaken is <i>checked</i> against work schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures. |
| | voltage power system circuit | 3.2 | Safe working documentation is surrendered and high voltage power system circuit breakers are made ready for service. |
| | breakers | 3.3 | Work site is rehabilitated, cleaned up and confirmed safe |
| 1 | | | Dewer Trenemiesien Systems |

| Page 89 of 165Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | Page 89 of 165 |
|--|----------------|
|--|----------------|

| | in accordance with established procedures. |
|-----|---|
| 3.4 | <i>Tools</i> , equipment and any surplus resources and materials are cleaned, checked and returned to storage in accordance with established procedures. |
| 3.5 | Required works completion records, reports and/or documentation and information are completed, processed and appropriate personnel notified in accordance with established procedures. |

| Variable | Range |
|-------------------|---|
| Circuit breaker | Bulk oil |
| types may | small oil volume |
| include: | air blast |
| | • vacuum |
| | air insulated and |
| | gas insulated SF6 |
| Associated | operating mechanisms |
| control circuits | solenoids |
| include: | spring |
| | hydraulic and pneumatic drives |
| | contactors |
| | AC heaters |
| | tripping and closing circuits and |
| | control wiring |
| Diagnostic checks | insulation resistance |
| may include: | contact resistance (dynamic and static) |
| | timing (in-service and out of service) |
| | gas pressure |
| | air pressure |
| | gas density |
| | oil pressure |
| | minimum operate checks |
| Specialized tools | insulation resistance test sets |
| may include: | contact resistance tester |
| | trip and close coil testers |
| | manufacturer's specific tools |
| | sequence timing equipment |

| Evidence Guide | | | | |
|--|---|-----------------------------------|--|------------------------|
| Critical Aspects of Competence Assessment requires evidence that the candidate: Implement Occupational Health and Safety workpla procedures and practices including the use of risk of measures Apply sustainable energy principles and practices | | kplace sk control es | | |
| Page 90 of 165 | M | inistry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |

| Underpinning | Demonstrates knowledge of: |
|---------------|--|
| Knowledge and | Occupational Health and Safety principles |
| Attitudes | Low voltage - energized work practices for substations |
| | Low voltage switching principles |
| | Enterprise specific - specialized tools |
| | Enterprise specific - equipment installation procedures |
| | Substation tools and equipment |
| | Typical fault conditions and symptoms |
| | Equipment components and materials – substations |
| | Substation LV supply design principles |
| | Hvdraulic and pneumatic system principles – Substations |
| | Circuit breaker construction principles - substations |
| | Circuit breaker operating principles - substations |
| Underpinning | Demonstrates skills of: |
| Skills | Safe working practice |
| | Enterprise specific - policy and procedures instructions |
| | Enterprise specific - OHS instructions |
| | Enterprise specific - technical drawing and documents |
| | Enterprise specific - switching diagrams |
| | Enterprise specific - data management processes |
| | Analyze and interpret results and measurements - |
| | substations |
| | Substation safety practices |
| | Substation switching practices |
| Resources | Access is required to real or appropriately simulated |
| Implication | situations, including work areas, materials and equipment, |
| • | and to information on workplace practices and OHS practices. |
| | In addition to the resources listed above, in Context of and |
| | specific resources for assessment, evidence should show |
| | demonstrated competence working at realistic heights above |
| | ground, i.e. above 3 meters, in limited spaces, with different |
| | structural/construction types and method and in a variety of |
| | environments. |
| Methods of | Competence may be assessed through: |
| Assessment | Interview / Written Test |
| | Observation / Demonstration with Oral Questioning |
| Context of | Competence may be assessed in the work place or in a |
| Assessment | simulated work place setting. |

| Page 91 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| Occupational Standard : Power Transmission Systems Installation and Maintenance Level IV | | |
|---|---|--|
| Unit Title Assemble, Set-Up and Test Personnel Computers | | |
| Unit Code | EIS TIM4 06 0612 | |
| Unit Descriptor | This unit covers assembly, setting up and testing personal computers as directed in computer service manuals. It encompasses safe working practices, checking computer components, assembling components to form a basic personal computer, installing and testing basic operating system, drivers and application software, following written and oral instruction and applying customer relations procedures. | |

| Elements | Performance Criteria | |
|---------------------------------------|----------------------|--|
| 1. Assemble personal computer | 1.1 | OHS procedures for a given work area are identified, obtained and understood through established routines and procedures. |
| | 1.2 | Established OHS risk control measures and procedures in relation to computer and keyboard use are followed. |
| | 1.3 | Advice is sought from the work supervisor to ensure the work is coordinated effectively with others. |
| | 1.4 | Computer, components, operating system and application software are obtained in accordance with established routines and checked as meeting requirements. |
| | 1.5 | Computer components are assembled and connected in accordance with manufacturer's instructions. |
| | 1.6 | Routine quality checks are carried out in accordance with work instructions. |
| | 1.7 | Procedures are followed for referring non-routine events to immediate supervisor for directions. |
| 2. Install operating | 2.1. | Established OHS risk control measures and procedures for carrying out the work are followed. |
| system and application software | 2.2. | Computer is started up and on-screen instructions for the installation of the operating system to default configuration are followed, including drivers. |
| | 2.3. | Application software is installed to default configuration following on-screen installation instruction. |
| | 2.4. | Computer shutdown procedures are followed and computer switched off. |
| | 2.5. | Routine quality checks are carried out in accordance |

| Page 92 of 165 Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|---|--|------------------------|
|---|--|------------------------|

| | | with work instructions. |
|---------------------------|------|--|
| | 2.6. | Routine quality checks are carried out in accordance with work instructions. |
| | 2.7. | Procedures for referring non-routine events to immediate supervisor for directions are followed. |
| 3. Install operating | 3.1 | Established OHS risk control measures and procedures for carrying out the work are followed. |
| system and application | 3.2 | Computer is switched on and start-up procedures are followed and checked. |
| Software | 3.3 | Operating system and application programs are checked to be opening and operating correctly. |
| | 3.4 | Faults are identified as being the result of faulty hardware or software. |
| | 3.5 | The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures. |
| | 3.6 | Faults are rectified in accordance with computer hardware, operating system and application instructions. |
| | 3.7 | Procedures for referring non-routine events to immediate supervisor for directions are followed. |
| | 3.8 | Computer shutdown procedures are followed and computer switched off. |
| | 3.9 | Work is carried out efficiently without waste of materials or damage to apparatus, circuits, the surrounding environment or services and using sustainable energy principles. |
| 4. Complete work and | 4.1 | OHS risk control work completion measures and procedures are followed. |
| report. | 4.2 | Work area is cleaned and made safe in accordance with established procedures. |
| | 4.3 | Work supervisor is notified of the completion of the work in accordance with established procedures. |

| Variable | Range | | | |
|---|--|--|--|--|
| This unit shall be demonstrated in relation to: | Assembling setting-up test and rectifying faults in a personal computer for single user operation and not intended to be connected to a network | | | |
| Hardware faults | replacement of subassemblies and interconnections | | | |
| Page 93 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | | | |

| rectification is | |
|------------------|--|
| confined to: | |
| | |

| Software faults | | resetting default configuration |
|------------------|---|---------------------------------|
| rectification is | • | resetting deladit configuration |
| confined to: | | |

Г

| Evidence Guide | |
|--|--|
| 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 Apply sustainable energy principles and practices Conduct work observing the relevant legislation, regulations, policies and workplace procedures Assemble, set-up and test personal computers including: Correctly connecting computer, components and peripherals. Installing a basic operating system for single user operation. Installing application software to default configuration. Testing computer operation. Identifying and rectifying interconnection faults. Shutting down a computer correctly. Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions |
| Underpinning Knowledge and Attitudes | Demonstrates knowledge to: Personal computers, hardware structure Computer hardware sub-assemblies Personal computer operating systems, basics Occupational Health and Safety principles |
| Underpinning Skills | Demonstrates skills to: Personal computers, hardware structure Computer hardware sub-assemblies Occupational Health and Safety principles Electronic Safe working practices |
| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. |
| Methods of Assessment | Competence may be assessed through: Interview / Written Test Observation / Demonstration with Oral Questioning |
| Context of Assessment | Competence may be assessed in the work place or in a simulated work place setting. |

| Page 94 of 165 Ministry of Ec Copyrig | tion Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|--|---|------------------------|
|--|---|------------------------|

| Occupational Standard : Power Transmission Systems Installation and Maintenance Level IV | | |
|---|---|--|
| Unit Title | Terminate and Connect Components, Cables Wiring and Conductors for Electronic Circuits | |
| Unit Code | EIS TIM4 07 0612 | |
| Unit Descriptor | This unit covers the implementation, performance and evaluation of component connections and terminations of conductors, wiring, cables, and other recognized mediums. It encompasses implementing reliable termination and connection processes, working to specifications, safe use of connection and termination tools, safe use of termination and/or soldering devices, selection and placement of components, termination and connection reparation, termination and connection techniques, and valuating termination and connection work. | |

| Elements | Perfo | rmance Criteria |
|---|---------------------|---|
| 1. Prepare to implement connection/ | 1.1 | OHS procedures for a given work area are obtained and understood through established routines and procedures. |
| termination processes that | 1.2 | Established OHS risk control measures and procedures in preparation for the work are followed. |
| components, conductors, wiring and | 1.3 | Prepare to <i>implement connection/termination</i> processes that include components, conductors, wiring and cables for electronic circuits. |
| cables for electronic circuits | 1.4 | Safety hazards, which have not previously been identified, are reported and advise on risk control measures, are sought from the work supervisor. |
| | 1.5 | The scope and nature of work to be undertaken is determined from documentation and instructions from work supervisor. |
| | 1.6 | An implementation and work plan is developed to ensure the work is coordinated effectively with others. |
| | 1.7 | Materials required for the work are obtained in accordance with established routines and procedures. |
| | 1.8 | Tools, equipment, measuring and termination and connection devices needed to carry out the work are obtained and checked for correct operation and safety |
| 2. Connect/termi nate | 2.1 | Established OHS risk control measures and procedures for carrying out the work are followed. |
| components, | 2.2 | Components and connection/termination methods |
| Page 95 of 165 | linistry of Copy | Education right Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard June 2012 |

Ethiopia Occupational Standard

| | conductors, wiring and | | and devices are selected in accordance with their specified type and rating. (See Note 1) |
|----|---|-----|--|
| | cables | 2.3 | Components and conductors are placed in accordance with specification/drawing and correct polarity. |
| | | 2.4 | Terminations and connections are prepared in accordance to ensure reliability of connections in accordance with industry standards. |
| | | 2.5 | Termination and connections are made using devices and techniques that comply with manufacturer's requirements and industry standards. |
| | | 2.6 | Procedures for identifying and responding to non- routine events including defects are coordinated and acted in accordance with established procedures. |
| | | 2.7 | Connection/termination activities are carried out efficiently without unnecessary waste of materials or damage to apparatus and the surrounding environment or services and using sustainable energy practices. |
| 3. | Evaluate completed | 3.1 | Established OHS risk control measures and procedures for carrying out the work are followed. |
| | connections and terminations of components, conductors, wiring and cables | 3.2 | Defects in component placement, connections and terminations are identified by visual inspection and recorded. |
| | | 3.3 | Solutions to non-compliant work are developed and responded to in accordance with established procedures and requirements |
| | | 3.4 | Connections and terminations are performance tested for compliance with the specified Standard and non- compliance performance characteristics identified and recorded. |
| | | 3.5 | Rework is carried out to rectify defects and noncompliant performance characteristics to manufacturer's requirements and industry standards. |
| | | 3.6 | Connections and terminations are confirmed compliant with established procedures and requirements |
| 4. | Complete and document | 4.1 | OHS risk control work completion measures and procedures are followed. |
| | connections and terminations | 4.2 | Work site is cleaned and made safe in accordance with established procedures. |
| | activities | 4.3 | Evaluation documentation confirming compliance of the connections and terminations is verified in accordance with established procedures and requirements |
| | | 4.4 | Inspection, testing, and rectification work is documented |

| Page 96 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|----------------|------------------------------------|--|------------------------|
|----------------|------------------------------------|--|------------------------|

| | in accordance with established procedures. |
|---|--|
| Variable | Range |
| This unit shall be demonstrated in relation to implementation, performance, and evaluation of component connections and terminations of : | Conductors, wiring, cables, and other recognized mediums for electronic circuits. This shall include: implementing reliable termination and connection processes selection and placement of at least five different types of electronic components connection of electronic components by soldering termination and connection of a coaxial cable termination and connection of a high performance copper cable termination of an insulated cable by using a crimped connection evaluating reliability of termination and connection work and providing solutions |

| Evidence Guide | 9 | |
|--|--|--|
| Critical Aspects Competence | of Assessment requires evidence that the candidate: implement occupational health and safety workplace procedures and practices including the use of risk control measures apply sustainable energy principles and practices conduct work observing the relevant legislation, regulations, policies and workplace procedures | |
| Underpinning Knowledge and Attitudes | Demonstrates knowledge of: basic cable and conductor terminations electronic cable and conductor terminations basic of electronic component basic electrical testing and measuring devices and techniques electronic soldering equipment and techniques OHS principles and electronic safe working practices | |
| Underpinning Skills Resources Implication | Demonstrates skills to: terminate basic cable and conductor terminate electronic cable and conductor use basic electrical testing and measuring devices use electronic soldering equipment and techniques apply OHS practices and electronic safe working practices Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices | |
| Methods of Assessment | f Competence may be assessed through: nt Interview / Written Test Observation / Demonstration with Oral Questioning | |
| Context of Assessment | Competence may be assessed in the work place or in a simulated work place setting. | |
| Page 97 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | |

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | | |
|--|--|--|
| Unit Title | Investigate Quality of Supply Issues | |
| Unit Code | EIS TIM4 08 0612 | |
| Unit Descriptor | This unit covers the technical investigation of quality of supply issues and recommends solutions. Quality of supply issues may include television and radio interference, voltage complaints, harmonics and system irregularities. | |

| Elements Performance C | | Criteria | |
|--|---|--|---|
| 1. Plan and coordinate for the investigation of | 1.1 OHS pra Sustaina the <i>inves</i> are revie | ctices/procedures and Environmenta ole Energy procedures, which may in stigation of issues in the quality o wed and determined. | al and nfluence f supply , |
| issues in quality of Supply | 1.2 Purpose outcomes personne | of the investigation is established ar s of the work are confirmed with the I. | nd expected appropriate |
| | 1.3 Organiza specifica establish | tional established procedures on po ions for the investigation are obtaine ed with the appropriate personnel. | licies and ed or |
| | 1.4 Equipme selected requirem | nt/tools and personal protective equi and coordinated based on specified ents and established procedures. | ipment are |
| | 1.5 Work is p and effect for comp standard procedur | rioritized and sequenced for the mo tive outcome following consultation etion within acceptable timeframes, and in accordance with established es. | st efficient with others to a quality |
| | 1.6 Risk cont evaluated | rol measures are identified, prioritized against the work schedule. | ed and |
| | 1.7 Relevant performa establish | work permits are secured to coordir nce of work according to requiremer ed procedures. | nate the nts and/or |
| | 1.8 Resource personal identified a safe an | es including personnel, equipment, to protective equipment required for th , scheduled and coordinated and co d technical working order. | ools and e job are nfirmed in |
| | 1.9 Liaison a personne resolved | nd communication issues with other I, authorities, clients and land owner and activities coordinated to carry o | /authorized rs are ut work. |
| | 1.10 Site is pr | epared according to the work sched | ule and to |
| Page 98 of 165 | Ainistry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |

| | | | minimize risk and damage to property, commerce, and individuals in accordance with established procedures. |
|----|---|------|--|
| | | 1.11 | Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities coordinated and authorized where applicable in accordance with established procedures. |
| | | 1.12 | Positioning of road signs, barriers and warning devices is planned in accordance with requirements. |
| 2. | Carry out and coordinate the | 2. 1 | Circuit/system modeling is used to evaluate alternative proposals as per established procedures. |
| | investigation of issues in the quality of supply | 2.2 | OHS and Sustainable Energy principles, functionality and practices to reduce the incidents of accidents and minimize waste are incorporated into the project in accordance with requirements and/or established procedures. |
| | | 2. 3 | Investigation decisions are made on the basis of safety and effective outcomes according to requirements and/or established procedures. |
| | | 2. 4 | Mathematical models of the quality system are used to analyze the effectiveness of the finished product/service as per requirements and established procedures. |
| | | 2.5 | Technical advice is given to potential hazards, safety risks and control measures so that monitoring and preventative action can be undertaken and/or appropriate authorities consulted, where necessary, in accordance with requirements and established procedures. |
| | | 2. 6 | Essential knowledge and associated skills is applied to Analyze specific data and compare it with compliance specifications to ensure completion of the project within an agreed timeframe according to requirements. |
| | | 2.7 | Solutions to non-routine problems are identified and acted using acquired essential knowledge and associated skills according to requirements. |
| | | 2. 8 | Quality of work is monitored against personal performance agreement and/or established organizational and professional standards. |
| | | 2. 9 | Testing of quality is undertaken according to requirements and established procedures. |

| 3. | 3. Complete and coordinate the investigation of issues in the quality of supply | 3.1 | Final assessments of the quality of supply are undertaken to ensure they comply with all requirements and include all specifications and documentations needed to complete the supply brief. |
|----|--|-----|---|
| | | 3.2 | Appropriate personnel are notified of completion and reports and/or completion documents are finalized. |
| | | 3.3 | Reports and/or completion documents are submitted to relevant personnel/organizations for approval and, where applicable, statutory or regulatory approval. |
| | | 3.4 | Approved copies of quality assessment documents are issued and records are updated in accordance with established procedures. |

| Variable | Range |
|---|---|
| This shall/may be demonstrated in relation to the investigation of supply issues and may include the following: | distribution feeders/networks substations transformers HV switchgear LV switchgear relevant protection systems fuses and circuit breakers |

| Evidence Guide | |
|--|--|
| 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 Apply sustainable energy principles and practices Conduct work observing the relevant legislation, regulations, policies and workplace procedures |
| Underpinning Knowledge and Attitudes | Demonstrates knowledge of: Occupational Health and Safety principles Occupational Health and Safety principles - enterprise responsibilities Safe design principles Test equipment – fundamentals Test equipment E – field |
| Underpinning Skills | Demonstrates skills of:Electrical safe working practiceQuality of supply measures |
| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace and OHS practices. |
| Methods of | Competence may be assessed through: |
| | Devuer Trenemiesian Oveterna |

| Page 100 of 165 Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|--|--|------------------------|
|--|--|------------------------|

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

| Page 101 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|-----------------|------------------------------------|--|------------------------|
|-----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | |
|--|---|
| Unit Title | Maintain Voltage Regulating Equipment (Capacitor Banks) |
| Unit Code | EIS TIM4 09 0612 |
| Unit Descriptor | This covers the maintenance and repair of substation voltage regulating equipment and is restricted to high voltage capacitor banks and their associated switching reactors and the inspection, recording of information, testing and measurement of the associated control circuits. It also includes the range of acceptance tests and discharge requirements for complete units within a substation in accordance with established enterprise standards and procedures. It also encompasses fault diagnosis and pre- commissioning tests and interpretation of test results against agreed specifications. |

| Elements | Performance Criteria | | |
|---|----------------------|--|--|
| 1. Prepare/plan to maintain voltage | 1.1 | Work schedules including drawings, plans, requirements procedures and material lists are acquired, analyzed and the extent of work determined. | |
| regulating equipment (capacitor banks) | 1.2 | Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites. | |
| banks) | 1.3 | Hazards are identified, OHS risks assessed and control measures are prioritized, implemented and monitored including emergency exits kept clear, to ensure safe systems of work are followed and according to established procedures. | |
| | 1.4 | Work is prioritized and sequenced for the most efficient and effective outcome following consultation with others for completion within acceptable timeframes, to agreed quality standards and in accordance with established policies and procedures. | |
| | 1.5 | Risk control measures are identified, prioritized, implemented and evaluated against the work schedule. | |
| | 1.6 | Resources including personnel, equipment, tools and personal protective equipment required for the job are identified, acquired and confirmed in safe/technical working order. | |
| | 1.7 | Liaison issues with other personnel and/or authorities are resolved and activities coordinated to facilitate the | |

| Page 102 of 165 Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|--|--|------------------------|
|--|--|------------------------|

| | | work. | | |
|---|--------------------|---|--|--|
| | 1.8 | Personne operators respectiv and appro with estal | el participating in the work including and contractors are fully briefed, the responsibilities explained and con opriate authorization checked in ac blished procedures. | plant heir ordinated cordance |
| | 1.9 | Work site and to mi personne | is prepared according to the work nimize risk and damage to property I in accordance with established pr | schedule / and ocedures. |
| 2. Carry out the maintenance of voltage regulating | 2.1 | OHS and to reduce waste are with estal | sustainable energy principles and the incidence of accidents and mir implemented and monitored in ac blished procedures. | practices nimize cordance |
| equipment (capacitor banks) | 2.2 | CPR, res related sa requireme | cue from live electrical apparatus a afety procedures are in place accor ents and established procedures. | nd other ding to |
| | 2.3 | Safe work requirement establishe | king documentation is acquired and ents completed in accordance with ed procedures. | 1 |
| | 2.4 | Lifting, cli tools/equ exercised | mbing and working aloft, use of po- ipment techniques and practices and in accordance with established pre- | wer e safely ocedures. |
| | 2.5 | Hazard w hazards a immediat to establi | arnings and safety signs are recog and assessed OHS risks are report e authorized persons for directions shed procedures. | nized and ed to the according |
| | 2.6 | Capacito in accord | r bank is isolated, discharged and r ance with requirements. | naintained |
| | 2.7 | Defective replaced enterprise | capacitor elements are identified, in accordance with manufacturers e procedures and recommendation | located and and s. |
| | 2.8 | Capacito and mea enterprise | r network is balanced and pre-servi surements completed in accordance e procedures. | ce tests ce with |
| | 2.9 | Unplanne accordan | ed events or conditions are respond ce with established procedures. | led to in |
| 3. Complete the maintenance of voltage regulating | 3.1 | Work und conforma and solut procedure | lertaken is <i>checked</i> against work s nce with requirements, anomalies ions identified in accordance with e es. | chedule for reported stablished |
| equipment (capacitor banks) | 3.2 | Safe wor capacitor | king documentation is surrendered bank is made ready for service. | and the |
| , | 3.3 | Work site | is rehabilitated, cleaned up and co | onfirmed |
| Page 103 of 165 | Vinistry of Cop | f Education yright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |

| | safe in accordance with established procedures. |
|-----|---|
| 3.4 | Tools, equipment and any surplus resources and materials are cleaned, checked and returned to storage in accordance with established procedures. |
| 3.5 | Required works completion records, reports and/or documentation and information are completed, processed and appropriate personnel notified in accordance with established procedures. |

| Variable | Range |
|--|---|
| Checks and measurements may include: | inspection and cleaning identification and replacement of defective/unserviceable elements/cans unbalance current/voltage tests functional tests and control/alarm system checks |

| Evidence Guide | |
|--|--|
| 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 Apply sustainable energy principles and practices Conduct work observing the relevant legislation, regulations, policies and workplace procedures |
| Underpinning Knowledge and Attitudes | Demonstrates knowledge of: Occupational Health and Safety principles Enterprise specific - specialized tools Substation tools and equipment Equipment components and materials - substations Static reactive plant principles - substations |
| Underpinning Skills | Demonstrates skills to: Electrical safe working practice Enterprise specific - policy and procedures instructions Low voltage - energized work practices for substations Enterprise specific - switching diagrams Enterprise specific - technical drawing and documents Analyze and interpret results and measurements - substations Enterprise specific - equipment installation Procedures Enterprise specific - data management processes Typical fault conditions and symptoms Enterprise specific - OHS instructions Substation safety practices Substation switching practices |

| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. In addition to the resources listed above, in Context of and specific resources for assessment, evidence should show demonstrated competence working at realistic heights above ground, i.e. above 3 meters, in limited spaces, with different structural/construction types and method and in a variety of environments. |
|--------------------------|---|
| Methods of Assessment | Competence may be assessed through: Interview / Written Test Observation / Demonstration with Oral Questioning |
| Context of Assessment | Competence may be assessed in the work place or in a simulated work place setting. |

| Page 105 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|-----------------|------------------------------------|--|------------------------|
|-----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | | | |
|--|---|--|--|
| Unit Title | Install HV Plant and Equipment | | |
| Unit Code | EIS TIM4 10 0612 | | |
| Unit Descriptor | This covers the installation of high voltage plant and equipment and includes the pre-commissioning tests within agreed specifications. It includes the installation of the earthen systems, tertiary cabling and/or bus bar systems in accordance with enterprise procedures but does not include the necessary protection systems. | | |

| Elements | Performance Criteria | | | |
|---|----------------------|--|--|--|
| Prepare/plan the installation of high voltage plant and equipment | 1.1 | Work schedules including drawings, plans, requirements procedures and material lists are acquired, analyzed and the extent of work determined. | | |
| | 1.2 | Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites. | | |
| | 1.3 | Hazards are identified, OHS risks assessed and control measures are prioritized, implemented and monitored including emergency exits kept clear, to ensure safe systems of work are followed and according to established procedures. | | |
| | 1.4 | Work is prioritized and sequenced for the most efficient and effective outcome following consultation with others for completion within acceptable timeframes, to agreed quality standards and in accordance with established policies and procedures. | | |
| | 1.5 | Risk control measures are identified, prioritized, implemented and evaluated against the work schedule. | | |
| | 1.6 | Resources including personnel, equipment, tools and personal protective equipment required for the job are identified, acquired and confirmed in safe/technical working order. | | |
| | 1.7 | Liaison issues with other personnel and/or authorities are resolved and activities coordinated to facilitate the work. | | |
| | 1.8 | Personnel participating in the work including plant operators and contractors are fully briefed, their respective responsibilities explained and coordinated and appropriate authorization checked in accordance with established procedures. | | |

| Page 106 of 165 Ministry Co | Education Pow vright Ethic | ver Transmission Systems allation and Maintenance pia Occupational Standard | Version 1 June 2012 |
|--------------------------------|-------------------------------|---|------------------------|
|--------------------------------|-------------------------------|---|------------------------|

| | 1.9 | Work site and to mi personne | e is prepared according to the work inimize risk and damage to property I in accordance with established pr | schedule y and ocedures. |
|--|-----------|---|---|--|
| 2. Carry out the installation of high voltage plant and | 2.1. | OHS and sustainable energy principles and practices to reduce the incidence of accidents and minimize waste are implemented and monitored in accordance with established procedures. | | |
| equipment | 2.2. | CPR, res related sa requirem | cue from live electrical apparatus a afety procedures are in place accor ents and established procedures. | nd other ding to |
| | 2.3. | Safe wor requirem establish | king documentation is acquired and ents completed in accordance with ed procedures. | ł |
| | 2.4. | Lifting, cl tools/equ exercised | imbing and working aloft, use of po ipment techniques and practices and in accordance with established pr | wer re safely ocedures. |
| | 2.5. | Hazard w hazards a immediat to establi | varnings and safety signs are recog and assessed OHS risks are report e authorized persons for directions shed procedures. | nized and ed to the according |
| | 2.6. | Earthen r confirmed policies a | requirements are identified and inst d installed in accordance with enter and procedures. | alled or prise |
| | 2.7. | Foundatio construct <i>high vol</i> a | ons and other appropriate civil work ed and/or confirmed ready for the e tage plant and equipment. | ks are erection of |
| | 2.8. | High volta associate are instal enterprise | age plant and equipment is erected ad HV connections, LV controls and led in accordance with manufacture e procedures and recommendation | l and l supplies ers and s. |
| | 2.9. | Remedia encounte requirem | l actions are taken to overcome any red in the work schedule according ents and/or established procedures | y shortfalls j to s. |
| | 2.10. | Pre-comr voltage p accordan | missioning checks are carried out a lant and equipment made ready for ce with established policies and pro- | nd the high r service in ocedures. |
| | 2.11. | Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures. | | |
| 3. Complete the installation of | 3.1 of | Work und conforma and solut | dertaken is checked against work s ince with requirements, anomalies ions identified in accordance with e | schedule for reported established |
| Page 107 of 165 Ministry of Education Copyright | | Education | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
| high voltage plant and equipment | | procedures. |
|--|-----|---|
| | 3.2 | Safe working documentation is surrendered and installed power system high voltage plant and equipment made ready for service. |
| | 3.3 | Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures. |
| | 3.4 | Tools, equipment and any surplus resources and materials are cleaned, checked and returned to storage in accordance with established procedures. |
| | 3.5 | Required works completion records, reports and/or documentation and information are completed, processed and appropriate personnel notified in accordance with established procedures. |
| | 3.6 | Associated drawings, schematics and diagrams are updated to reflect work as executed in accordance with enterprise procedures. |

| Variable | Range | | | |
|---|--|--|--|--|
| This Competence Standard Unit shall/may be demonstrated in relation to substation high voltage plant and equipment | May include: • transformers and instrument transformers • auxiliary transformers • surge arrestors • wave traps • circuit breakers • capacitor banks • disconnections • earth switches • ripples filters • static VAR compensators • gas insulated switchgear • fault throwers • resistor banks • poutral earthean transformers and reactors | | | |
| | high current DC switchgear and equipment | | | |
| Pre- commissioning checks and measurements | May include: insulation resistance winding resistance dielectric dissipation factor winding ratio vector group low voltage excitation continuity trip and close checks gas pressure checks contact timing and other checks | | | |
| Page 108 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | | | |

| | measurement | s as required by the manufacturer | | |
|--------------------|--------------------------------|--|--|--|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| The following | Appropriate a | nd relevant persons (see Personnel) | | |
| constants and | Appropriate au | uthorities | | |
| variables included | Assessing risk | < compared with the second sec | | |
| in this unit: | Assessment | | | |
| | Authorization | | | |
| | Diagnostic, te | sting and restoration | | |
| | Documenting storage of info | detail work events, record keeping and or | | |
| | Drawings and | specifications | | |
| | Emergency | | | |
| | Environmenta | l and sustainable energy procedures | | |
| | Environmental legislation | | | |
| | Environmenta | I management documentation | | |
| | Established p | ocedures | | |
| | Fall prevention | 1 | | |
| | Hazards | | | |
| | Identifying haz | zards | | |
| | Inspect | | | |
| | Legislation | | | |
| | MSDS | | | |
| | Notification | | | |
| | OHS practices | 3 | | |
| | OHS issues | | | |
| | Permits and/o | r permits to work | | |
| | Personnel | | | |
| | Quality assura | ince systems | | |
| | Requirements | | | |
| | Testing proce | dures | | |
| | Work clearance | ce systems | | |

| Evidence Guid | e | | | | |
|---|---|--|------------------------|--|--|
| Critical Aspects Competence | of Assessment requires Implement Occup procedures and p measures Apply sustainable Conduct work obs regulations, policie | Assessment requires evidence that the candidate: Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures Apply sustainable energy principles and practices Conduct work observing the relevant legislation, regulations, policies and workplace procedures | | | |
| Underpinning Knowledge and AttitudesDemonstrates knowledge of:• Occupational Health and Safety principles• Low voltage switching principles | | | | | |
| Page 109 of 165 | Ministry of Education Copyright E | Power Transmission Systems Installation and Maintenance thiopia Occupational Standard | Version 1 June 2012 | | |

| | Enterprise specific - technical drawing and documents Enterprise specific - equipment installation procedures Enterprise specific - data management processes Substation tools and equipment Analyze and interpret results and measurements - substation |
|--------------------------|---|
| Underpinning Skills | Demonstrates skills to: Electrical safe working practice Low voltage - energized work practices for substations Enterprise specific - policy and procedures instructions Enterprise specific - OHS instruction Substation safety practices Enterprise specific - specialized tools Typical fault conditions and symptoms - substations Equipment components and materials - substations Enterprise specific - switching diagrams |
| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. |
| Methods of Assessment | Competence may be assessed through: Interview / Written Test Observation / Demonstration with Oral Questioning |
| Context of Assessment | Competence may be assessed in the work place or in a simulated work place setting. |

| Page 110 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|-----------------|------------------------------------|--|------------------------|
|-----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | | | |
|--|---|--|--|
| Unit Title | Analyze and Appraise Fault and Outage Data | | |
| Unit Code | EIS TIM4 11 0612 | | |
| Unit Descriptor | This unit covers the data gathering and analysis of system outages and plant failures. It includes the recommending of solutions and maintenance plans to ensure system security. | | |

| Elements | Perfo | rmance Criteria | 3 | |
|--|-------------------|---|--|---|
| 1. Plan and coordinate for the analysis and appraisal | 1.1 | OHS practices, Sustainable Er the analysis a are reviewed a | /procedures and Environmen lergy procedures, which may nd appraisal of fault and οι nd determined. | tal and influence <i>Itage data</i> , |
| of fault and outage data | 1.2 | Purpose of the expected outco appropriate pe | analysis/appraisal is establis omes of the work are confirme rsonnel. | hed and ed with the |
| | 1.3 | Organizational specifications f established wit | established procedures on p or the design are obtained or h the appropriate personnel. | olicies and |
| | 1.4 | Equipment/tool selected and co requirements a | s and personal protective eq oordinated based on specifie nd established procedures | uipment are d |
| | 1.5 | Work is prioritized and sequenced for the most efficient and effective outcome following consultation with others for completion within acceptable timeframes, the a quality standard and in accordance with established procedures | | |
| | 1.6 | Risk control me evaluated agai | easures are identified, prioritiz | zed and |
| | 1.7 | Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures | | |
| | 1.8 | Resources including personnel, equipment, tools and personal protective equipment required for the job are identified, scheduled and coordinated and confirmed in a safe and technical working order | | |
| | 1.9 | Liaison and con other/authorize land-owners ar carry out work | mmunication issues with d personnel, authorities, clien e resolved and activities cool | nts and rdinated to |
| | 1.10 | Site is prepare minimize risk a | d according to the work scheond | dule and to merce, and |
| Page 111 of 165 | Ministry o Cop | Education F right Et | Power Transmission Systems Installation and Maintenance Iniopia Occupational Standard | Version 1 June 2012 |

| | | individuals in accordance with established procedures |
|---|-----|---|
| 2. Carry out and coordinate the analysis and appraisal of fault and | 2.1 | Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities coordinated and authorized where applicable in accordance with established procedures |
| outage data | 2.2 | Positioning of road signs, barriers and warning devices is planned in accordance with requirements |
| | 2.3 | Circuit/systems modeling is used to evaluate alternative proposals as per established procedures. |
| | 2.4 | Circuit/systems modeling is used to evaluate alternative proposals as per established procedures. |
| | 2.5 | OHS and sustainable energy principles, functionality and practices to reduce the incidents of accidents and minimize waste are incorporated into the project in accordance with requirements and/or established procedures |
| | 2.6 | Analysis \ Appraisal decisions are made on the basis of safety and effective outcomes according to requirements and/or established procedures |
| | 2.7 | Mathematical models of solutions for system outages and plant failures are used to Analyze the effectiveness of the finished project as per requirements and established procedures |
| | 2.8 | Technical advice is given to potential hazards, safety risks and control measures so that monitoring and preventative action can be undertaken and/or appropriate authorities consulted, where necessary, in accordance with requirements and established procedures |
| | 2.9 | Essential knowledge and associated skills are applied to Analyze specific data and compare it with compliance specifications to ensure completion of the project within an agreed timeframe according to requirements. |
| 3. Complete and coordinate the analysis and appraisal of fault and outage data | 3.1 | Solutions to non-routine problems are identified and acted using acquired essential knowledge and associated skills according to requirements |
| | 3.2 | Quality of work is monitored against personal performance agreement and/or established organizational and professional standards. |
| | 3.3 | Final inspections of the analysis/appraisal are undertaken to ensure they comply with all requirements |

| Page 112 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|-----------------|------------------------------------|--|------------------------|
|-----------------|------------------------------------|--|------------------------|

| | and include all specifications and documentations needed to complete the design brief. |
|-----|---|
| 3.4 | Appropriate personnel are notified of completion and reports and/or completion documents are finalized. |

| Variable | Range | | |
|---|---|--|---------------------------|
| This shall/may be demonstrated in relation to the analysis and appraisal of fault and outage data and may include the following: | Relevant pro both HV and distribution fe substations a HV switchge LV switchgea | tection systems, LV (fuses and circuit breakers) eeders/networks (overhead and und and transformers ar ar | derground) |
| The following constants and variables included in this unit: | Appropriate a Appropriate a Appropriate a Appropriate a Assessing rise Assessment Authorization Confined spate Diagnostic, ta Documenting storage of interview of the Drawings an Emergency Environment Environment Environment Established p Fall prevention Hazards Identifying have Inspect Legislation MSDS Notification. OHS practice OHS issues Permits and Personnel. Quality assuing Requirement Safe design Testing proceing | and relevant persons (see Personn authorities work platform sk n ace esting and restoration. g detail work events, record keep formation. d specifications al and sustainable energy procedur al legislation. al management documentation. orocedures. on azards es / or permits to work rance systems. ts. principles edures | el) bing and or res |
| Page 113 of 165 | inistry of Education | Power Transmission Systems Installation and Maintenance | Version 1 June 2012 |

| Evidence Guide | | | | |
|--|--|--|--|--|
| 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 Apply sustainable energy principles and practices Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures | | | |
| Underpinning Knowledge and Attitudes | Demonstrates knowledge of: Occupational Health and Safety principles Occupational health and safety , enterprise responsibilities HV principles Power line safety - implementation and monitoring Electrical equipment - protection and control schemes Safe design principles Switchgear installation Low voltage switching principles High voltage fault switching principles High voltage distribution transformer principles High voltage SWER system Feeder automation system Analysis network event records | | | |
| Underpinning Skills | Demonstrates skills to: Occupational Health and Safety principles Electrical safe working practice HV practices Power line safety - implementation and monitoring Electrical equipment - protection and control schemes Safe design practices Switchgear installation Low voltage switching practices High voltage switching practices High voltage fault switching practices High voltage distribution transformer practices High voltage SWER system Feeder automation system Analysis network event records | | | |
| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. | | | |
| Methods of Assessment | Competence may be assessed through: Interview / Written Test Observation / Demonstration with Oral Questioning | | | |
| Assessment | work place setting. | | | |
| Page 114 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | | | |

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | | | |
|--|--|--|--|
| Unit Title | Draft and Layout Overhead and Ground Transmission Extension | | |
| Unit Code | EIS TIM4 12 0612 | | |
| Unit Descriptor | This covers the planning and layout of one or two pole minor overhead transmission extensions, including the estimating of the costs and/or resources for the work to be undertaken. It also encompasses on-the-job design, surveying techniques and layout to the field locations as per enterprise requirements. | | |

| Elements | Perfo | rmance Criteria |
|---|-------|--|
| Prepare/plan to draft and layout an overhead transmission extension | 1.1 | Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are obtained, analyzed, if necessary, by site inspection and the extent of the preparation of the work determined for planning and coordination. |
| | 1.2 | Work is prioritized and sequenced for the most efficient and effective outcome following consultation with others for completion within acceptable timeframes, to a quality standard and in accordance with established procedures. |
| | 1.3 | Risk control measures are identified, prioritized and evaluated against the work schedule. |
| | 1.4 | Relevant requirements and established procedures for the work are to all personnel and identified for all work sites. |
| | 1.5 | Hazards are identified, OHS risks assessed and control measures are prioritized, implemented and monitored including emergency exits kept clear, to ensure safe systems of work are followed and according to established procedures. |
| | 1.6 | Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures. |
| | 1.7 | Resources including personnel, equipment, tools and personal protective equipment required for the job are identified, scheduled and coordinated and confirmed in a safe and technical working order. |
| | 1.8 | Clients/Customers are provided with possible solutions and /or options within the scope, acceptable cost and requirements. |

| Page 115 of 165 Ministry of Educati Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|--|--|------------------------|
|--|--|------------------------|

| | 1.9 | Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work. |
|--|------|---|
| | 1.10 | Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities coordinated and authorized where applicable in accordance with established procedures. |
| | 1.11 | Site is prepared according to the work schedule and to minimize risk and damage to property, commerce, and individuals in accordance with established procedures. |
| | 1.12 | Positioning of road signs, barriers and warning devices is planned in accordance with requirements. |
| 2. Carry out drafting and layout of an overhead | 2.1 | OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimize waste are monitored and acted in accordance with requirements and/or established procedures. |
| distribution extension | 2.2 | First Aid, Pole Top Rescue and other related work procedures are performed according to requirements and/or established procedures. |
| | 2.3 | Lifting, climbing, working in confined spaces and aloft, and use of power tools/equipment, techniques and practices are safely exercised according to requirements. |
| | 2.4 | Hazard warnings and safety signs are recognized and hazards and assessed OHS risks are reported to the immediate authorized persons for directions according to established procedures. |
| | 2.5 | Remedial actions are taken to overcome any shortfalls encountered in the work schedule according to requirements and/or established procedures. |
| | 2.6 | The drafting and layout of an overhead transmission extension is carried out, in accordance with the work schedule and requirements and/or established procedures. |
| | 2.7 | Essential knowledge and associated skills for the drafting and layout of an overhead distribution extension is applied to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements. |
| | 2.8 | Solutions to non-routine problems are identified and acted using acquired essential knowledge and associated skills according to requirements. |

| Page 116 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|-----------------|------------------------------------|--|------------------------|
|-----------------|------------------------------------|--|------------------------|

| | 2.9 | Ongoing checks of quality of the work are undertaken in accordance with requirements and established procedures to ensure a quality like outcome is achieved for the client/customer and to a community/industry standard |
|--|-----|---|
| 3. Complete drafting and layout of an overhead transmission extension | 3.1 | Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures. |
| | 3.2 | Accidents and/or injuries are reported and followed up in accordance with requirements/established procedures. |
| | 3.3 | Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures. |
| | 3.4 | Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures. |
| | 3.5 | Relevant work permit(s) are signed off and the job is returned to service and advised to client/customer in accordance with requirements. |
| | 3.6 | Works completion records, reports, as installed / modified drawing(s) and/or documentation and information are confirmed, processed and appropriate personnel notified. |

| Variable | Range | | | |
|--|---|--|--|--|
| This shall/may be demonstrated in relation to: | undertaking a draft and layout of an overhead transmission extension Pole including wood concrete, steel and composite) associated hardware including conductors (bare wire and aerial bundle cable) cross arms, insulators ACR regulator earthen air break switches gas switches capacitor units transformers links fuses sectionalizes lead arrestors | | | |
| Dama 447 of 405 | Ministry of Education Power Transmission Systems Version 1 | | | |

| Page 117 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|-----------------|------------------------------------|--|------------------------|
|-----------------|------------------------------------|--|------------------------|

| | HV switchgear |
|--------------------|--|
| | LV switchgear |
| | control boxes |
| | communications |
| | equipment |
| | Ianterns |
| | • signage |
| | supervisory cable |
| | cable TV |
| | substations |
| | relevant protection systems and associated civil works |
| The following | Appropriate and relevant persons (see Personnel) |
| constants and | Appropriate authorities |
| variables included | Appropriate work platform |
| in this unit: | Assessing risk |
| | Assessment |
| | Authorization |
| | Confined space |
| | Diagnostic testing and restoration |
| | Documenting detail work events record keeping and or |
| | storage of information |
| | Drawings and specifications |
| | Emergency |
| | Environmental and sustainable energy procedures |
| | Environmental legislation |
| | Environmental management documentation |
| | Established procedures |
| | Eall prevention |
| | Hazards |
| | Identifying hazards |
| | Inspect |
| | |
| | MSDS |
| | Notification |
| | OHS practices |
| | OHS issues |
| | Permits and/or permits to work |
| | Personnel |
| | Quality assurance systems |
| | Requirements |
| | Safe design principles |
| | Testing procedures |
| | Work clearance systems |
| | Authorization Confined space Diagnostic, testing and restoration Documenting detail work events, record keeping and or storage of information Drawings and specifications Emergency Environmental and sustainable energy procedures Environmental legislation Environmental management documentation Established procedures Fall prevention Hazards Identifying hazards Inspect Legislation MSDS Notification OHS practices OHS issues Permits and/or permits to work Personnel Quality assurance systems Requirements Safe design principles Testing procedures |

| Evidence Guide | |
|--|---|
| 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 Apply sustainable energy principles and practices Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures |
| Underpinning Knowledge and Attitudes | Demonstrates knowledge of: Power line transmission installation Power line installation safety Pole and hardware installation Transmission overhead line component fundamentals Enterprise specific – switching diagrams Interpretation of power transmission network drawings and documentation Overhead transmission extension layout principles Surveying techniques Introduction to computer software (Power line) and CAD |
| Underpinning Skill | Demonstrates skills to: safe working practices and applying OHS practices Power line transmission installation Power line installation safety Pole and hardware installation Transmission overhead line component fundamentals Enterprise specific – switching diagrams Interpretation of power transmission network drawings and documentation Overhead transmission extension Surveying techniques |
| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. |
| Methods of Assessment | Competence may be assessed through: Interview / Written Test Observation / Demonstration with Oral Questioning |
| Context of Assessment | Competence may be assessed in the work place or in a simulated work place setting. |

| Page 119 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|-----------------|------------------------------------|--|------------------------|
|-----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | | | |
|--|---|--|--|
| Unit Title | Contribute to Coordinated HV Live Line Work | | |
| Unit Code | EIS TIM4 13 0612 | | |
| Unit Descriptor | This specifies the outcomes required of live line working team members to work effectively as a cohesive team to ensure safety of all team members and the community when undertaking high voltage (HV) live line work. It includes the pre-work briefing on tasks to be undertaken, roles of individual team members, identification of possible hazards, risk management analysis and implementation of palliative measures to control or mitigate the risk to acceptable levels. It also encompasses the monitoring of work performance to ensure safety, and the post-work debriefing to identify areas for continuous improvement. | | |

| Elements | Performance | Criteria | |
|--|--|--|--|
| 1. Plan to contribute to a coordinated High Voltage Live Line work | 1.1 Works so requirem lists, are inspectio determin | chedule(s), including drawings, plans ents, established procedures, and m obtained, analyzed , if necessary, by n and the extent of the preparation of ed for planning and coordination by | s, naterial y site of the work the team. |
| team. | 1.2 Relevant the work identified | requirements and established proce are communicated to all team memi for all work sites. | edures for pers and |
| | 1.3 OHS poli and esta <i>lines</i> are the work members | cies and procedures related to requi- blished procedures for the working obtained and confirmed for the purp to be performed and discussed amo | irements on HV live poses of ong all team |
| | 1.4 Work is p with all te are follow timefram procedur | prioritized and sequenced following of eam members to ensure safe system wed for completion within acceptable es and in accordance with establishe es. | consultation ns of work ed |
| | 1.5 OHS and assessm identified against th weather live line v | I live line work hazards are identified ents conducted and control measure , prioritized, implemented and docur ne work schedule, including the chec and environmental conditions to ens work can be undertaken safely. | l, risk es are nented cking of site ure that |
| | 1.6 Relevant work are by the te | live line work permits or authority for secured to coordinate the performate am according to requirements and/o | r live line nce of work r |
| Page 120 of 165 | Iinistry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |

| | | establishe | d procedures. | |
|---|-------------------|--|---|---|
| | 1.7 | Resources personal p identified, a safe and | s including personnel, equipment, to protective equipment required for th scheduled and coordinated and co t technical working order. | ools and e job are nfirmed in |
| | 1.8 | Personnel operators respective where app procedure | participating in the work, including and contractors, are fully briefed ar responsibilities coordinated and a plicable in accordance with establish s. | plant nd uthorized hed |
| | 1.9 | Liaison an personnel resolved a | nd communication issues with other, , authorities, clients and land owner and activities coordinated to carry o | /authorized rs are ut work. |
| | 1.10 | Site is pre minimize r individuals | pared according to the work schedurisk and damage to property, comm s in accordance with established pro | ule and to erce, and ocedures. |
| | 1.11 | All team m and agree and possil | nembers to be engaged in the work , without ambiguity, on their respec ble role changes during the course | discuss tive roles, of work. |
| | 1.12 | Positioning is planned requireme | g of road signs, barriers and warnin I and coordinated in accordance wit nts. | ig devices th |
| 2. Carry out the contribution to coordinated High Voltage Live Line work. | 2.1 | OHS and reduce the are monito requireme particular, strictly ad | Sustainable Energy principles and perincidents of accidents and minimize ored and acted in accordance with onts and/or established procedures. established live line working procedured to. | practices to ze waste In dures are |
| | 2.2 | First Aid, I performed procedure | Rescue and other related work proc l according to requirements and/or o s | edures are established |
| | 2.3 | Lifting, clir tools/equij applicable requireme | mbing, working aloft, and use of pow oment, techniques and practices, w are safely exercised according to onts. | wer here |
| | 2.4 | Live line p are in plac requireme | ermits and other provisions for live as required, in accordance with t ints and established procedures. | line work he |
| | 2.5 | Essential contributic is applied and, to qu according | knowledge and associated skills in on to coordinated High Voltage Live to ensure completion in an agreed ality standards with a minimum of v to requirements. | the safe Line work timeframe vaste |
| | 2.6 | Work is ur | ndertaken on HV Live Line in a tean | n |
| Page 121 of 165 | Ministry o Cop | f Education yright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |

| | | environme requireme | ent work according to the work sche nts/ established procedures. | edule and | | | |
|--|--|--|---|---|--|--|--|
| | 2.7 | Work is sh coordinate pre-work b | Work is shared among all team members in a coordinated manner as discussed and agreed during pre-work briefing. | | | | |
| | 2.8 | Hazard wa hazards a team mem authorized establishe | arnings and safety signs are recogn nd assessed OHS risks are discuss obers and reported to the immediate I persons for directions according to d procedures. | nized and sed with e | | | |
| | 2.9 | Unplanned work are c appropriat | d events in the maintenance of HV liscussed among all team members e action undertaken accordingly. | Live Line and | | | |
| | 2.10 | Solutions acted usin associated | to non-routine problems are identifi g acquired essential knowledge an d skills according to requirements. | ed and d | | | |
| | 2.11 | Ongoing c accordanc procedure for the clie standard. | hecks of quality of the work are une e with requirements and establishes s to ensure a quality like outcome is ent/customer and to a community/in | dertaken in ed s achieved dustry | | | |
| 3. Complete the contribution to coordinated High Voltage | 3.1 | Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures. | | | | | |
| Live Line work. | 3.2 | Accidents accordance | and/or injuries are reported and fol e with requirements/established pro- | lowed up in ocedures. | | | |
| | 3.3 | Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures. | | | | | |
| | 3.4 | Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures. | | | | | |
| | 3.5 | Relevant v Voltage Li advised to requireme | work permit(s) are signed off and, H ve Line work is returned to service client/customer in accordance with nts. | ligh and າ | | | |
| | 3.6 | Works cor drawing(s) confirmed notified. | npletion records, reports, as installe and/or documentation and informa , processed and appropriate persor | ed/modified ation are anel | | | |
| | 3.7 | Aspects of feedback | f work schedule are discussed iden with fellow team members and infor ent forwarded to appropriate persor | tified via mation on nnel | | | |
| Page 122 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | | | Version 1 June 2012 | | | |

| | according to established procedures. | | |
|--|--|--|--|
| Variable | Range | | |
| This shall/may be demonstrated in relation to contributing to coordinated high voltage live line work This is a common unit for all developed live line working techniques such as: | hot stick gloves and barrier, or bare hand technical details utilizing these live line techniques are covered in other respective units of competence for live line work HV Live Line work may include the maintenance of energized HV electrical apparatus conductors and cables Work may be undertaken: on ladders, insulated elevating work platforms or through the use of a work platform secured to a helicopter. The emphasis of this unit is to foster and promote effective team work live line work to ensure safety of all team members and the community during the course of work. | | |
| The following constants and variables included in the Range Statement of this unit: | Appropriate and relevant persons (see Personnel) Appropriate authorities Appropriate work platform Assessing risk Assessment Authorization Diagnostic, testing and restoration Documenting detail work events, record keeping and or storage of information Drawings and specifications Emergency Environmental and sustainable energy procedures Environmental legislation Environmental management documentation Established procedures Fall prevention Hazards Identifying hazards Inspect Legislation OHS practices OHS issues Permits and/or permits to work Personnel Quality assurance systems Requirements Testing procedures Work clearance systems | | |

| [| | Power Transmission Systems | |
|-----------------|-----------------------|--------------------------------|-----------|
| Page 123 of 165 | Ministry of Education | Installation and Maintenance | Version 1 |
| | Copyright | Ethiopia Occupational Standard | June 2012 |

| Evidence Guide | |
|----------------------------|---|
| Critical Aspects of | Assessment requires evidence that the candidate: |
| Competence | Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures Apply sustainable energy principles and practices Conduct work observing the relevant legislation, |
| | regulations, policies and workplace procedures |
| Knowledge and Attitudes | Demonstrates knowledge of: Occupational Health and Safety principles Electrical safe working practice Power line safety practices |
| | Statutory and safety considerations |
| | Fundamentals for working safely near live electrical apparatus Enterprise Specific - policy and procedures instructions Enterprise Specific - OHS Instructions |
| | Enterprise specific - specialized tools |
| | Enterprise Specific - team work high voltage live line |
| Skills | Demonstrates skills to: Electrical safe working practice Power line safety practices Statutory and safety considerations Fundamentals for working safely near live electrical apparatus Enterprise Specific - policy and procedures instructions Enterprise Specific - OHS Instructions |
| | Enterprise specific - specialized tools |
| | Enterprise Specific - team work high voltage live line |
| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. |
| Methods of | Competence may be assessed through: |
| Assessment | Interview / Written Test Observation / Demonstration with Oral Questioning |
| Context of | Competence may be assessed in the work place or in a |
| Assessment | simulated work place setting. |

| Page 124 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|-----------------|------------------------------------|--|------------------------|
|-----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | | | |
|--|---|--|--|
| Unit Title | Maintain Transmission Field Devices | | |
| Unit Code | EIS TIM4 14 0612 | | |
| Unit Descriptor | This covers the maintenance of ACRs, gas switches, regulators and line capacitors, communication systems including mobile phones and TMR radio. It includes secondary injection, timing, and function tests and proving correct tripping, reclosing and remote operation. | | |

| Elements | Per | formance Criteria |
|--------------------------------|-----|--|
| 1. Plan for the maintenance of | 1.1 | Work schedules including drawings, plans, requirements procedures and material lists are acquired, analyzed and the extent of work determined. |
| transmission field devices | 1.2 | Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites. |
| | 1.3 | Hazards are identified, OHS risks assessed and control measures are prioritized, implemented and monitored including emergency exits kept clear, to ensure safe systems of work are followed and according to established procedures. |
| | 1.4 | Work is prioritized and sequenced for the most efficient and effective outcome following consultation with others for completion within acceptable timeframes, to agreed quality standards and in accordance with established policies and procedures. |
| | 1.5 | Risk control measures are identified, prioritized, implemented and evaluated against the work schedule. |
| | 1.6 | Resources including personnel, equipment, tools and personal protective equipment required for the job are identified, acquired and confirmed in safe/technical working order. |
| | 1.7 | Liaison issues with other personnel and/or authorities are resolved and activities coordinated to facilitate the work. |
| | 1.8 | Personnel participating in the work including plant operators and contractors are fully briefed, their respective responsibilities explained and coordinated and appropriate authorization checked in accordance with established procedures. |
| | 1.9 | Work site is prepared according to the work schedule |

| Page 125 of 165 Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|--|--|------------------------|
|--|--|------------------------|

| - | | | | |
|--|--|----------------|--|---|
| | | | and to min | mize risk and damage to property and n accordance with established procedures. |
| 2. | Carry out the maintenance of transmission | 2.1 | OHS and s reduce the are implem established | sustainable energy principles and practices to incidence of accidents and minimize waste tented and monitored in accordance with procedures. |
| | network field devices | 2.2 | CPR, Reso related safe requiremen | cue from live electrical apparatus and other ety procedures are in place according to hts and established procedures. |
| | | 2.3 | Safe working requirement procedures | ng documentation is acquired and hts completed in accordance with established s. |
| | | 2.4 | Lifting, use practices a established | of power tools/equipment techniques and re safely exercised in accordance with procedures. |
| | | 2.5 | Hazard wa hazards ar immediate established | rnings and safety signs are recognized and ad assessed OHS risks are reported to the authorized persons for directions according to b procedures. |
| | | 2.6 | Essential k maintenar applied to e and, to qua according t | nowledge and associated skills for the safe ace of transmission network field devices is ensure completion in an agreed timeframe ality standards with a minimum of waste to requirements. |
| | | 2.7 | Maintenan devices is established | ce, including testing of transmission field undertaken according to requirements and procedures. |
| | | 2.8 | Unplanned accordance | events or conditions are responded to in e with established procedures. |
| 3. | Complete the maintenance of | 3.1 | Functional completed requiremer | checks of transmission field devices are and all work checked against the nts to ensure compliance. |
| transmission network field devices | | 3.2 | Anomalies measured identified ir | between the work schedule requirements and performance are reported and solutions accordance with established procedures. |
| | | 3.3 | Safe working transforme | ng documentation is surrendered and r made ready for service. |
| | | 3.4 | Work site is in accorda | s rehabilitated, cleaned up and confirmed safe nce with established procedures. |
| | | 3.5 | Tools, equi materials a in accordar | pment and any surplus resources and re cleaned, checked and returned to storage nce with established procedures. |
| | I | 3.6 | Approved of | copies of the maintenance of transmission |
| Pa | age 126 of 165 | Ministry Co | of Education | Installation and Maintenance June 2012 Ethiopia Occupational Standard |

| | network field devices documents are issues and records are updated in accordance with established procedures. | | | |
|---|---|--|--|--|
| Variable | Range | | | |
| This shall/may be demonstrated in relation to the maintenance of transmission field devices: | Automatic circuit recloses (ACRs) gas switches secondary injection tests primary injection tests TMR radio's, SCADA remote control over current earth fault sensitive earth fault inverse time curves definite time curves tripping reclose DC supplies AC supplies alarms OHS practices and issues Permits and/or permits to work Personnel Quality assurance systems Requirements Testing procedures Work clearance systems | | | |

| Evidence Guide | |
|--|---|
| 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 Apply sustainable energy principles and practices Conduct work observing the relevant legislation, regulations, policies and workplace procedures |
| Underpinning Knowledge and Attitudes | Demonstrates knowledge of: Occupational Health and Safety principles Electrical safe working practice Statutory and safety considerations Electrical equipment - protection and control schemes Discrete protection schemes - isolation and tagging procedures Protection devices - maintenance and commission principles |

| Page 127 of 165 Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|--|--|------------------------|
|--|--|------------------------|

| | Manufacturers requirements Disposal procedures for insulating materials Visual inspection procedures - substations Surge relay operation and maintenance - substations Analyze and interpret results and measurements - substations Voltage regulation scheme principles – substations Use of test equipment on a discrete protection scheme - substations |
|--------------------------|---|
| Underpinning Skills | Demonstrates skills to: Electrical safe working practice Statutory and safety considerations Electrical equipment - protection and control schemes Discrete protection schemes - isolation and tagging procedures Protection devices - maintenance and commission practices Manufacturers requirements Disposal procedures for insulating materials Visual inspection procedures - substations Analyze and interpret results and measurements - substations Voltage regulation scheme principles – substations Use of test equipment on a discrete protection scheme - substations |
| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. |
| Methods of Assessment | Competence may be assessed through: Interview / Written Test Observation / Demonstration with Oral Questioning |
| Context of Assessment | Competence may be assessed in the work place or in a simulated work place setting. |

| Page 128 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|-----------------|------------------------------------|--|------------------------|
|-----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | | |
|--|---|--|
| Unit Title | Commission Transmission Field Devices | |
| Unit Code | EIS TIM4 15 0612 | |
| Unit Descriptor | This covers the commissioning of ACRs, gas switches, regulators and line capacitors, communication systems including mobile phones and TMR radio. It also includes communication with the Operating Authority, testing, clearing after test and energizing using techniques that are acceptable to the Operating Authority. | |

| Elements | Per | Performance Criteria | | | |
|---|----------------|---|--|---|--|
| 1. Plan for the commissioning of transmission | 1.1 1 | Work sch requirem acquired, | edules including drawings, plans, ents procedures and material lists a analyzed and the extent of work d | are etermined. | |
| field devices | 1.2 | Relevant the work identified | requirements and established proc are communicated to all personnel for all work sites. | edures for and | |
| | 1.3 | Hazards measures including systems establishe | are identified, OHS risks assessed s are prioritized, implemented and r emergency exits kept clear, to ens of work are followed and according ed procedures. | and control monitored ure safe to | |
| | 1.4 | Work is p and effec others for agreed qu establishe | prioritized and sequenced for the mo- tive outcome following consultation r completion within acceptable time uality standards and in accordance ed policies and procedures. | ost efficient with frames, to with | |
| | 1.5 | Resource personal identified working c | es including personnel, equipment, protective equipment required for th , acquired and confirmed in safe/te- order. | tools and he job are chnical | |
| | 1.6 | Liaison is are resolv work. | sues with other personnel and/or a ved and activities coordinated to factivities coordinated to factiv | uthorities cilitate the | |
| | 1.7 | Personne operators respective and appre with estal | el participating in the work including and contractors are fully briefed, the responsibilities explained and con opriate authorization checked in ac blished procedures. | plant heir ordinated cordance | |
| | 1.8 | Work site and to mi | e is prepared according to the work nimize risk and damage to property | schedule y and | |
| Page 129 of 165 | Ministry Co | of Education pyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 | |

| | | personnel in accordance with established procedures. | | |
|---|--------------------|--|--|---|
| 2. Carry out the commissioning of transmission network field | 2.1 | OHS and to reduce waste are with esta | sustainable energy principles and the incidence of accidents and mir implemented and monitored in ac blished procedures. | practices nimize cordance |
| devices | 2.2 | CPR, res related sa requirem | cue from live electrical apparatus a afety procedures are in place accor ents and established procedures. | nd other ding to |
| | 2.3 | Safe wor requirem establish | king documentation is acquired and ents completed in accordance with ed procedures. | I |
| | 2.4 | Lifting, us practices establish | se of power tools/equipment technic are safely exercised in accordance ed procedures. | ques and with |
| | 2.5 | Hazard w hazards a preventiv consulted establish | varnings and safety signs are recog and assessed OHS risks are monito e action taken and/or appropriate a d where necessary in accordance w ed procedures. | nized and pred and uthorities rith |
| | 2.6 | Commiss devices is establish | ioning, including testing of transmis s undertaken according to requirem ed procedures. | ssion field ents and |
| | 2.7 | Data is a specificat work is w requirem | nalyzed and compared with compli- tions to ensure completion of the m ithin an agreed timeframe and acco ents. | ance aintenance ording to |
| | 2.8 | Unplanne accordan | ed events or conditions are respond ce with established procedures. | led to in |
| 3. Complete the commissioning of transmission | 3.1 | Functiona complete requirem | al checks of transmission field device d and all work checked against the ents to ensure compliance. | ces are |
| network field devices | 3.2 | Anomalies between the work schedule requirements and measured performance are reported and solutions identified in accordance with established procedures. | | |
| | 3.3 | 3 Safe working documentation is surrendered and transformer made ready for service. | | |
| | 3.4 | Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures. | | |
| | 3.5 | Tools, eq materials in accord | uipment and any surplus resources are cleaned, checked and returned ance with established procedures. | and to storage |
| | 3.6 | Documer field devi | nts and records related to the transmices are updated in accordance with | nission |
| Page 130 of 165 | Ministry of Cop | of Education opyright Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard June 2012 | | |

| | established procedures. | | |
|--|---|--|--|
| Variable | Range | | |
| This shall/may b demonstrated in relation to: | the commissioning of transmission field devices Automatic circuit recloses (ACRs) gas switches secondary injection tests primary injection tests TMR radio's SCADA remote control Over current earth fault sensitive earth fault inverse time curves definite time curves tripping reclose DC supplies AC supplies alarms | | |
| The following constants and variables include in this unit: | AC supplies AC supplies alarms Appropriate and relevant persons (see Personnel) Appropriate authorities Appropriate work platform Assessing risk Assessment Authorization Confined space Diagnostic, testing and restoration Documenting detail work events, record keeping and or storage of information Drawings and specifications Emergency Environmental and sustainable energy procedures Environmental management documentation Established procedures Fall prevention Hazards Identifying hazards | | |
| | Legislation MSDS Notification OHS practices • OHS issues Permits and/or permits to work | | |
| Page 131 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | | |

| • | Personnel |
|---|---------------------------|
| • | Quality assurance systems |
| • | Requirements |
| • | Testing procedures |
| • | Work clearance systems |

Г

| Evidence Guide | |
|--|---|
| 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 Apply sustainable energy principles and practices Conduct work observing the relevant legislation, regulations, policies and workplace procedures |
| Underpinning Knowledge and Attitudes | Demonstrates knowledge of: Occupational Health and Safety principles Statutory and safety considerations Electrical equipment - protection and control schemes Discrete protection schemes - isolation and tagging procedures Protection devices - maintenance and commission principles Manufacturers' requirements Disposal procedures for insulating materials Visual inspection procedures -substations Surge relay operation and maintenance - substations Analyze and interpret results and measurements - substations Commissioning of transmission protection and control systems - substations Voltage regulation scheme principles - substations Use of test equipment on a discrete protection scheme - substations |
| Underpinning Skills | Demonstrates skills to: Occupational Health and Safety practices Electrical safe working practice Statutory and safety considerations Electrical equipment - protection and control schemes Discrete protection schemes - isolation and tagging procedures Protection devices - maintenance and commission Manufacturers' requirements Disposal procedures for insulating materials Visual inspection procedures -substations Surge relay operation and maintenance - substations Analyze and interpret results and measurements - |

| Page 132 of 165 Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|--|--|------------------------|
|--|--|------------------------|

| | substations Commissioning of transmission protection and control systems – substations Voltage regulation scheme principles - substations Use of test equipment on a discrete protection scheme - substations |
|--------------------------|--|
| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. |
| Methods of Assessment | Competence may be assessed through: Interview / Written Test Observation / Demonstration with Oral Questioning |
| Context of Assessment | Competence may be assessed in the work place or in a simulated work place setting. |

| Page 133 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|-----------------|------------------------------------|--|------------------------|
|-----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | | |
|--|--|--|
| Unit Title | Respond to Technical Enquiries and Requests | |
| Unit Code | EIS TIM4 16 0612 | |
| Unit Descriptor | This unit covers responding to enquiries of a technical nature using electricity supply industry (ESI) requirements, techniques and processes. It includes the relevant application of knowledge of relevant acts and regulations, codes of practice, guidelines and compliance regimes, and arrangements used to facilitate a response to enquiries or requests. The enquiries may be internal or with customers. | |

| Elements | Performance Criteria | | |
|---|--|--|--|
| Prepare to respond to technical enquiries and | 1.1 Instructions related to responding to enquiries using industry requirements, techniques and processes of a technical nature to be performed are received and confirmed | | |
| requests | 1.2 Relevant requirements and established procedures to be followed and, relevant personnel (including internal and/or customer) to be communicated with for the work to be performed are identified | | |
| | 1.3 OHS policies and procedures to be followed for the work to be performed are received and confirmed. | | |
| | 1.4 Suggestions to assist in meeting the safety requirements for responding to technical enquiries and requests are made to others involved in the work. | | |
| | 1.5 Hazards are identified; OHS risks assessed and control measures are prioritized, implemented and monitored including emergency exits kept clear according to established procedures. | | |
| | 1.6 Scope of responsibility and process of relevant work permit(s) issue is identified, received and confirmed according to requirements and established procedures | | |
| | 1.7 Relevant responsibility associated withf aid, safety observers and/or other related work safety procedures at the worksite are identified in accordance with requirements and established procedures to ensure safety measures are followed in the instance of an incident | | |
| | 1.8 Processes for identifying and reporting client (including internal and customer) issues to appropriate personnel in accordance with industry/acceptable /community standards are identified | | |
| Page 134 of 165 | nistry of Education Copyright Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard June 2012 | | |

| | | 1.9 | Workplace to given ins minimize ri and individ procedures | and the work schedule is confirmed structions for a quality outcome and sk and damage to property, comme uals in accordance and established | d according to erce, stock |
|----|--|----------------|--|---|--|
| | | 1.10 |) Electricity i requiremer live electric identified | nfrastructure assets, related voltage hts, where applicable, for working sa al apparatus as non-electrical work | es and afely near er are |
| | | 1.11 | Safe appro may apply, requiremen intended w | ach distances including any zones as defined in industry guidelines, its and/or established procedures for ork are confirmed | thereof that or the |
| 2. | Carry out responses to technical | 2.1 | OHS princi accidents a instructions | ples and practices to reduce the ind are identified in accordance with giv s, requirements and/or established | cidents of en procedures |
| | enquiries and requests | 2.2 | Enquiries a requiremer manner | and/or requests are responded to ad the and established procedures, and | ccording to d in a timely |
| | | 2.3 | Working sa requiremen requests an instructions | Ifely and complying with all safety Its for responding to technical enqu re followed in accordance with give and established outlines/ procedu | iries and n ıres |
| | | | Processes and OHS ri directions a followed | for monitoring and reporting/referrin isks to the immediate authorized per according to established procedures | ng hazards ersonnel for s are |
| | | 2.5 | Non-routine authorized established | e events are referred to the immedia personnel for directions according procedures | ate to |
| | | | Apply esse application requests to and, to qua according t | ntial knowledge and associated ski of responding to technical enquirie ensure completion in an agreed tir lity standards with a minimum of war o requirements | lls in the s and neframe aste |
| | | 2.7 | Unexpected events associated with enquiries and/or requests of a technical nature are responded to using acquired known solutions and skills related to routine procedures to ensure work instructions and established procedures are met. | | |
| 3. | 3. Complete 3 responses to | | Work sche checking o personnel i | dule and anomalies for completion f the work are reported to authorize n accordance with established proc | and d cedures |
| | enquiries and | 3.2 | Processes | for reporting to authorized personn | el |
| Pa | ge 135 of 165 | Ministry Co | of Education | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |

| requests | | accidents and/or incidents are confirmed in accordance with established procedures |
|----------|-----|--|
| | 3.3 | Requirements for returning work permit(s) and/or access Authorization permits, where applicable, are confirmed |
| | 3.4 | Appropriate personnel are notified of work completion according to established procedures. |
| | 3.5 | Works completion records, report forms/data sheets are completed accurately in accordance with given instructions and established procedures |

| Variable | Range |
|--|---|
| This shall/may be demonstrated in relation to: | safe working so defined by relevant or regulatory agencies/bodies, local government legislation, Industry bi-partite body – Guidelines/Codes of Practices or other related requirements for responding to technical enquires and requests |
| Work functions may include: | the application of knowledge of electricity supply industry (ESI) transmission, transmission or rail/tram network requirements, techniques and processes and the application of knowledge of relevant acts and regulations, codes of practice, guidelines and compliance regimes, and arrangements used to facilitate a response to enquiries or requests. Examples include knowledge of critical codes in the industry – e.g. storm code emergencies, identification of key equipment, recognition of normal and abnormal industry situations, key processes and systems used in the industry such as, maps, catalogues, and the application of general safety and environmental processes and practices used in the industry. Questioning (customer information gathering techniques) including observance of equipment, identification of anomalies from the norm and reporting of information. Recognition of normal and abnormal industry situations may include: equipment performance indicators anomalies report knowledge of critical system/network failures/anomalies and knowledge of key processes and practices used in the industry e.g. maps, drawings etc., and safety and environment processes and practices used in the industry situations |

| Page 136 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|-----------------|------------------------------------|--|------------------------|
|-----------------|------------------------------------|--|------------------------|

| | Note: Examples performance indicators are - SAIDI - System Average Interruption Duration Index, SAIFI - System Average Interruption Frequency Index, MAIFI – Momentary Average Interruption Frequency Index | | |
|--------------------|--|--|--|
| | CAIDI - Customer Average Interruption Duration Index, | | |
| | Enquiries may be internal or with customers | | |
| The following | Appropriate and relevant persons | | |
| constants and | Appropriate authorities | | |
| variables included | Assessing risk | | |
| in this unit: | Authorization | | |
| | Drawings and specifications | | |
| | Emergency | | |
| | Established procedures. | | |
| | Hazards | | |
| | Identifying hazards | | |
| | Legislation | | |
| | Internal and external customers | | |
| | Notification. | | |
| | OHS practices | | |
| | OHS issues | | |
| | Permits and/or permits to work | | |
| | Work clearance systems. | | |

| Evidence Guide | | | |
|--|--|--|--|
| 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 Apply sustainable energy principles and practices Conduct work observing the relevant legislation, regulations, policies and workplace procedures | | |
| Underpinning Knowledge and Attitudes | regulations, policies and workplace procedures Demonstrates knowledge of: Occupational health and safety principles Engineering applications of material properties. Generation power systems Transmission, transmission and rail power systems Fundamentals for working safely near live electrical apparatus Environmental fundamentals Material handling and the environment Enterprise specific - policy and procedure instructions Enterprise specific - technical drawings and documents Technical enquiries and requests | | |
| Underpinning Skills | Demonstrates skills to:Occupational Health and Safety practices | | |
| Page 137 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | | |

| | Engineering applications of material properties. |
|-------------|--|
| | Generation power systems |
| | Transmission, transmission and rail power systems |
| | Fundamentals for working safely near live electrical |
| | apparatus |
| | Material handling and the environment |
| | Enterprise specific - policy and procedure instructions |
| | Enterprise specific - OHS instructions |
| | Technical enquiries and requests |
| Resources | Access is required to real or appropriately simulated |
| Implication | situations, including work areas, materials and equipment, |
| | and to information on workplace practices and OHS practices. |
| Methods of | Competence may be assessed through: |
| Assessment | Interview / Written Test |
| | Observation / Demonstration with Oral Questioning |
| Context of | Competence may be assessed in the work place or in a |
| Assessment | simulated work place setting. |

| Page 138 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|-----------------|------------------------------------|--|------------------------|
|-----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | | | | |
|--|--|--|--|--|
| Unit Title | Organize and Implement Line and Easement Surveys | | | |
| Unit Code | EIS TIM4 17 0612 | | | |
| Unit Descriptor | This covers the surveying of transmission and sub transmission lines and easements for activities associated with the design and installation of electrical equipment. This activity should encompass the use of instruments such as compasses, inclinometer, distance measuring devices, etc. and be in accordance with customer requirements, nominated design specifications and company processes. | | | |

| Elements | Performance Criteria | | |
|---|----------------------|---|--|
| 1. Plan and coordinate the Organization and implementatio n of line and easement surveys | 1.1 | OHS practices/procedures and environmental and sustainable energy procedures, which may influence the Organization and implementation of line and easement surveys, are reviewed and determined. | |
| | 1.2 | Purpose of the line and easement surveys is established and expected outcomes of the work are confirmed with the appropriate personnel. | |
| | 1.3 | Organizational established procedures on policies and specifications for the design are obtained or established with the appropriate personnel. | |
| | 1.4 | Equipment/tools and personnel protective equipment are selected and coordinated based on specified requirements and established procedures. | |
| | 1.5 | Work is prioritized and sequenced for the most efficient and effective outcome following consultation with others for completion within acceptable timeframes, to a quality standard and in accordance with established procedures. | |
| | 1.6 | Risk control measures are identified, prioritized and evaluated against the work schedule. | |
| | 1.7 | Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures. | |
| | 1.8 | Resources including personnel, equipment, tools and personal protective equipment required for the job are identified, scheduled and coordinated and confirmed in a safe and technical working order. | |
| | 1.9 | Liaison and communication issues with other/authorized personnel, authorities, clients and land | |

| Page 139 of 165 Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|--|--|------------------------|
|--|--|------------------------|

| | | owners a out work. | re resolved and activities coordinat | ed to carry | | |
|---|------------------------------------|--|---|---|--|--|
| | 1.10 | Site is pro minimize individua | Site is prepared according to the work schedule and to minimize risk and damage to property, commerce, and ndividuals in accordance with established procedures. | | | |
| | 1.11 | Personne operators respectiv where ap procedur | el participating in the work, including and contractors, are fully briefed a e responsibilities coordinated and a plicable in accordance with establis es. | g plant Ind authorized Shed | | |
| | 1.12 | Positionir is planne | ng of road signs, barriers and warni d in accordance with requirements | ng devices | | |
| 2. Carry out and coordinate th | d 2.1 e | Circuit/sy alternativ | stems modeling is used to evaluate e proposals as per established pro | e cedures. | | |
| Organization and implementatio n of line and easement | 2.2 | OHS and and pract minimize accordan procedur | OHS and sustainable energy principles, functionality and practices to reduce the incidents of accidents and minimize waste are incorporated into the project in accordance with requirements and/or established procedures. | | | |
| Surveys | 2.3 | Survey design decisions are made on the basis of safety and effective outcomes according to requirements and/or established procedures. | | | | |
| | 2.4 | Mathema used to A project as procedur | tical models of the transmission sy analyze the effectiveness of the finits sper requirements and established es. | stem are shed | | |
| | 2.5 | Technica risks and preventat appropria accordan procedur | I advice is given to potential hazard control measures so that monitorin tive action can be undertaken and/o the authorities consulted, where neo ce with requirements and establish es. | ls, safety ig and or cessary, in ed | | |
| | 2.6 | Essential to analyz complian project w requirem | knowledge and associated skills a e specific data and compare it with ce specifications to ensure complet ithin an agreed timeframe accordin- ents. | re applied ion of the g to | | |
| | 2.7 | Solutions to non-routine problems are identified and acted using acquired essential knowledge and associated skills according to requirements. | | | | |
| | 2.8 | Quality of performa Organiza | f work is monitored against personance agreement and/or established tional and professional standards. | al | | |
| | 2.9 | Work tea | ms/groups are arranged / coordina | ted / | | |
| Page 140 of 165 | Ministry of Education Copyright | | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 | | |

| | | evaluated to ensure planned goals are met according to established procedures. |
|---|-----|--|
| 3. Complete and coordinate the Organization and implementatio n of line and easement surveys | 3.1 | Final assessment of the surveys are undertaken to ensure they comply with all requirements and include all specifications and documentations needed to complete the design brief. |
| | 3.2 | Appropriate personnel are notified of completion and reports and/or completion documents are finalized. |
| | 3.3 | Reports and/or completion documents are submitted to relevant personnel/organizations for approval and, where applicable, statutory or regulatory approval. |
| | 3.4 | Approved copies of survey documents are issued and records are updated in accordance with established procedures. |

| Variable | Range | | | |
|---|--|--|--|--|
| This Competence Standard Unit shall/may be demonstrated in relation to: | the organization and implementation of line Survey instruments (theodolites, measuring devices, compasses, inclinometer) Survey software Poles conductors – bare wire and aerial bundled cable; cross arms insulators substations transformers HV switchgear LV switchgear | | | |
| The following constants and variables included in this unit: | Appropriate and relevant persons (see Personnel) Appropriate authorities Appropriate work platform Assessing risk Assessment Authorization Confined space Diagnostic, testing and restoration Documenting detail work events, record keeping and or storage of information Drawings and specifications Emergency Environmental and sustainable energy procedures Environmental legislation Environmental management documentation Established procedures Fall prevention | | | |
| Page 141 of 165 | Inistry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | | | |

| • | Hazards |
|---|--------------------------------|
| • | Identifying hazards |
| • | Inspect |
| • | Legislation |
| • | MŠDS |
| • | Notification |
| • | OHS practices |
| • | OHS issues |
| • | Permits and/or permits to work |
| • | Personnel |
| • | Quality assurance systems |
| • | Requirements |
| • | Safe design principles |
| • | Testing procedures |
| • | Work clearance systems |

П

| Evidence Guide | e | | | |
|--|--|--|--|--|
| Critical Aspects Competence | Assessment requires evidence that the candidate: Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures Apply sustainable energy principles and practices Conduct work observing the relevant legislation, regulations, policies and workplace procedures | | | |
| Underpinning Knowledge and Attitudes | Demonstrates knowledge of: Occupational Health and Safety principles Electrical safe working practice Occupational Health and Safety principles - enterprise responsibilities Safe design principles Surveying techniques Project management | | | |
| Underpinning Skills | Demonstrates skills to: Electrical safe working practice Occupational Health and Safety practices Surveying techniques Project management Safe design practices | | | |
| Resources Implication | Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. | | | |
| Methods of Assessment | Competence may be assessed through: Interview / Written Test Observation / Demonstration with Oral Questioning | | | |
| Context of Assessment | Competence may be assessed in the work place or in a simulated work place setting. | | | |
| Page 142 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | | | |

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | | | |
|--|---|--|--|
| Unit Title | Plan and Organize Work | | |
| Unit Code | EIS TIM4 18 0612 | | |
| Unit Descriptor | This unit covers the knowledge, skills and attitude required in planning and organizing work activities in a production application. It may be applied to a small independent operation or to a section of a large organization. | | |

| Elements | Performance Criteria | | | | |
|----------------------------|---|--|--|-------------|--|
| 1. Set objectives | 1.1 | Objectives are consistent with and linked to work activities in accordance with organizational aims | | | |
| | 1.2 | Objectives time frames | are stated as measurable targets | with clear | |
| | 1.3 | Support an reflected in t | d commitment of team members a the objectives | are | |
| | 1.4 | Realistic ar | nd attainable objectives are identifi | ed | |
| 2. Plan and schedule work | 2.1 | Tasks/work prioritized as | activities to be completed are ider s directed | ntified and | |
| activities | 2.2 | Tasks/work activities are broken down into steps in accordance with set time frames and achievable components | | | |
| | 2.3 | Task/work activities are assigned to appropriate team or individuals in accordance with agreed functions | | | |
| | 2.4 | Resources activity | are allocated as per requirements | of the | |
| | 2.5 | Schedule o | of work activities is coordinated w oncerned | ith | |
| 3. Implement work plans | 3.1 | Work methods and practices are identified in consultation with personnel concerned | | | |
| | 3.2 | <i>Work plans</i> are implemented in accordance with set time frames, resources and <i>standards</i> | | | |
| 4. Monitor work activities | 4.1 | Work activities are monitored and compared with set objectives | | | |
| | 4.2 | Work performance is monitored | | | |
| | 4.3 | 3 Deviations from work activities are reported and recommendations are coordinated with appropriate personnel and in accordance with set standards | | | |
| | 4.4 | Reporting requirements are complied with in accordance with recommended format | | | |
| Page 143 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion June 201 | | Version 1 June 2012 | | |
| | | 4.5 | Observe timeliness of report |
|----|--|-----|--|
| | | 4.6 | Files are established and maintained in accordance with standard operating procedures |
| 5. | Review and evaluate work plans and activities | 5.1 | Work plans, strategies and implementation are reviewed based on accurate, relevant and current information |
| | | 5.2 | Review is based on comprehensive consultation with appropriate personnel on outcomes of work plans and reliable feedback |
| | | 5.3 | Results of review are provided to concerned parties and formed as the basis for adjustments/simplifications to be made to policies, processes and activities |
| | | 5.4 | Performance appraisal is conducted in accordance with organization rules and regulations |
| | | 5.5 | Performance appraisal report is prepared and documented regularly as per organization requirements. |
| | | 5.6 | Recommendations are prepared and presented to appropriate personnel/authorities |
| | | 5.7 | Feedback mechanisms are implemented in line with organization policies |

| Variable | Range | | | | |
|-----------------|--|--|--|--|--|
| Objectives | Specific | | | | |
| | General | | | | |
| Resources | Personnel Supplies and materials | | | | |
| | Equipment and Sources for accessing specialist | | | | |
| | technology advice | | | | |
| | Services Budget | | | | |
| Schedule of wor | k • Daily • Contractual | | | | |
| activities | Work-based Regular | | | | |
| Work methods | Legislated regulations and codes of practice | | | | |
| and practices | Industry regulations and codes of practice | | | | |
| | Occupational health and safety practices | | | | |
| Work plans | Daily work plans | | | | |
| | Project plans | | | | |
| | Program plans | | | | |
| | Resource plans | | | | |
| | Skills development plans | | | | |
| | Management strategies and objectives | | | | |
| Standards | Performance targets | | | | |
| | Performance management and evaluation systems | | | | |
| | Occupational standards | | | | |
| | Employment contracts | | | | |
| | Client contracts | | | | |
| Page 144 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | | | | |

| | Discipline procedures | | | |
|-------------|---|--|--|--|
| | Workplace assessment guidelines | | | |
| | Internal quality assurance | | | |
| | Internal and external accountability and auditing | | | |
| | requirements | | | |
| | Training Regulation Standards | | | |
| | Safety Standards | | | |
| Appropriate | Appropriate personnel include: | | | |
| personnel/ | Management | | | |
| authorities | Line Staff | | | |
| Feedback | Feedback mechanisms | | | |
| mechanisms | include: | | | |
| | Verbal feedback Group discussion | | | |
| | Informal feedback | | | |
| | Formal feedback | | | |

| Evidence Guide | | | | |
|--|---|--|--|--|
| Critical Aspects o Competence | Assessment requires evidence that the candidate: set objectives planned and scheduled work activities implemented work plans monitored work activities reviewed and evaluated work plans and activities | | | |
| Underpinning Knowledge and Attitudes | Demonstrates knowledge of: Organization's strategic plan, policies rules and regulations, laws and objectives for work unit activities and priorities Organizations policies, strategic plans, guidelines related to the role of the work unit Team work and consultation strategies | | | |
| Underpinning Skills | Demonstrates skill of: Planning Leading Organizing Coordinating Communication Skills Inter-and intra-person/motivation skills Presentation skills | | | |
| Resource Implications | The following resources must be provided: Workplace or fully equipped location with necessary tools and equipment as well as consumable materials | | | |
| Methods of Assessment | Competence may be accessed through: Interview / Written Test Observation / Demonstration with Oral Questioning | | | |
| Context of Assessment | Competence may be assessed in the workplace or in simulated workplace setting. | | | |
| Page 145 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | | | |

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | | | |
|--|--|--|--|
| Unit Title | Migrate to New Technology | | |
| Unit Code | EIS TIM4 19 0612 | | |
| Unit Descriptor | This unit defines the competence required to apply skills and knowledge in using new or upgraded technology. The rationale behind this unit emphasizes the importance of constantly reviewing work processes, skills and techniques in order to ensure that the quality of the entire business process is maintained at the highest level possible through the appropriate application of new technology. To this end, the person is typically engaged in on-going review and research in order to discover and apply new technology or techniques to improve aspects of the organization's activities. | | |

| Elements | Perf | Performance Criteria | |
|--------------------------------------|--------|---|--|
| 1. Apply existin knowledge | ng 1.1 | Situations are identified where existing knowledge can be used as the basis for developing new skills. | |
| and techniques t | o 1.2 | New or upgraded technology skills are acquired and used to enhance learning. | |
| and transfer | 1.3 | New or upgraded equipment are identified, classified and used where appropriate, for the benefit of the organization. | |
| 2. Apply functions of | 2.1 | Testing of new or upgraded equipment is conducted according to the specification manual. | |
| technology t assist in solving | 0 2.2 | Features of new or upgraded equipment are applied within the organization | |
| organization | al 2.3 | Features and functions of new or upgraded equipment is used for solving organizational problems | |
| | 2.4 | Sources of information is accessed and used relating to new or upgraded equipment | |
| 3. Evaluate ne or upgraded | w 3.1 | New or upgraded equipment is evaluated for performance, usability and against OHS standards. | |
| technology performance | 3.2 | <i>Environmental considerations</i> are determined from new or upgraded equipment. | |
| | 3.3 | Feedback is sought from users where appropriate. | |

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

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

| Page 147 of 165 Ministry o Cop | Education right Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|-----------------------------------|---|------------------------|
|-----------------------------------|---|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | | | |
|--|---|--|--|
| Unit Title | Establish Quality Standards | | |
| Unit Code | EIS TIM4 20 0612 | | |
| Unit Descriptor | This unit covers the knowledge, skills and attitudes required to establish quality specifications for work outcomes and work performance. It includes monitoring and participation in maintaining and improving quality, identifying critical control points in the production of quality output and assisting in planning and implementing of quality assurance procedures. | | |

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

| Page 148 of 165 Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|--|--|------------------------|
|--|--|------------------------|

| r | | 1 | |
|--------------------|---|-----|---|
| of work outcome | | 5.2 | Inputs are inspected to confirm capability to meet quality requirements |
| | | 5.3 | Work is conducted to produce required outcomes |
| | | 5.4 | Work processes are monitored to confirm quality of output and/or service |
| | | 5.5 | Processes are adjusted to maintain outputs within specification. |
| 6. | Participate in maintaining and improving | 6.1 | Work area, materials, processes and product are routinely monitored to ensure compliance with quality requirements |
| | quality at work | 6.2 | Non-conformance in inputs, process, product and/or service is identified and reported according to workplace reporting requirements |
| | | 6.3 | Corrective action is taken within level of responsibility, to maintain quality standards |
| | | 6.4 | Quality issues are raised with designated personnel |
| 7. | Report problems that affect quality | 7.1 | Recognize potential or existing quality problems. |
| | | 7.2 | Identify instances of variation in quality from specifications or work instructions. |
| | | 7.3 | Report variation and potential problems to supervisor/manager according to enterprise guidelines. |

| Variable | Range |
|-------------------------|--|
| Sourced | End-usersCustomers or stakeholders |
| Legislated requirements | • Verification of product quality as part of consumer legislation or specific legislation related to product content or composition. |
| Safety procedures. | Use of tools and equipment for fabrication/production/ manufacturing works Workplace environment and handling of material safety, Following occupational health and safety procedures designated for the task Respect the policies, regulations, legislations, rule and procedures for manufacturing/production/fabrication works |

| Evidence Guide | | |
|----------------------------------|--|--|
| Critical Aspect of Competence | Assessment requires evidence that the candidate: Monitored quality of work Established quality specifications for product Participated in maintaining and improving quality at work | |

| Page 149 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|-----------------|------------------------------------|--|------------------------|
|-----------------|------------------------------------|--|------------------------|

| | Identified bazards and critical control points in the | | |
|---------------|---|--|--|
| | Identified flazards and childal control points in the production of quality product | | |
| | production of quality product | | |
| | Assisted in planning of quality assurance procedures | | |
| | Reported problems that affect quality | | |
| | Implemented quality assurance procedures | | |
| Underpinning | Demonstrates knowledge of: | | |
| Knowledge | work and product quality specifications | | |
| _ | quality policies and procedures | | |
| | improving guality at work | | |
| | bazards and critical points of operation | | |
| | obtaining and using information | | |
| | • obtaining and using information | | |
| | work activities | | |
| | accessing and using management systems to keep and | | |
| | maintain accurate records | | |
| | requirements for correct preparation and operation | | |
| | technical writing | | |
| Underpinning | Demonstrates skills in: | | |
| Skills | monitoring quality of work | | |
| | establishing quality specifications for product | | |
| | participating in maintaining and improving guality at work | | |
| | identifying hazards and critical control points in the | | |
| | production of quality product | | |
| | assisting in planning of quality assurance procedures | | |
| | reporting problems that affect quality | | |
| | implementing quality assurance procedures | | |
| Resource | The following resources must be provided: | | |
| Implications | Markplace or fully equipped environment with pecessary | | |
| Implications | Workplace of fully equipped environment, with necessary tools and equipment as well as consumable materials | | |
| Mothode of | Competence may be accessed through: | | |
| Accoccmont | | | |
| 7335331115111 | Interview/ Willeri iest Observation/Demonstration with Oral sweetianing | | |
| | Observation/Demonstration with Oral questioning | | |
| Context of | Competence may be assessed in the workplace or in a | | |
| Assessment | simulated workplace setting. | | |

| Page 150 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|-----------------|------------------------------------|--|------------------------|
|-----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | | |
|--|---|--|
| Unit Title | Unit Title Develop Individuals and Team | |
| Unit Code | EIS TIM4 21 0612 | |
| Unit Descriptor | This unit covers the knowledge, skills and attitudes required to determine individual and team development needs and facilitate the development of the workgroup. | |

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

| Page 151 of 165 Ministry of E Copyri |
|---|
|---|

| | | 3.4 | Records and reports of Competence are maintained within organizational requirement |
|----|--|-----|--|
| 4. | Develop team commitment and cooperation | 4.1 | Open communication processes to obtain and share information is used by team |
| | | 4.2 | Decisions are reached by the team in accordance with its agreed roles and responsibilities |
| | | 4.3 | Mutual concern and camaraderie are developed in the team |
| 5. | Facilitate accomplish- | 5.1 | Team members actively participated in team activities and communication processes |
| | ment of organizational | 5.2 | Teams members developed individual and joint responsibility for their actions |
| | yuais | 5.3 | Collaborative efforts are sustained to attain organizational goals |

| Variable | Range | | |
|--|--|--|--|
| Learning and development needs | Coaching, monitoring and/or supervision Formal/informal learning program Internal/external training provision Work experience/exchange/opportunities Personal study Career planning/development Performance evaluation Workplace skills assessment Recognition of prior learning | | |
| Organizational requirements Quality assurance and/or procedures manuals Goals, objectives, plans, systems and processes Legal and organizational policy/guidelines and requirements Safety policies, procedures and programs Confidentiality and security requirements Business and performance plans Ethical standards Quality and continuous improvement processes and atomdarde | | | |
| Feedback on performance | Formal/informal performance evaluation Obtaining feedback from supervisors and colleagues Obtaining feedback from clients Personal and reflective behavior strategies Routine and organizational methods for monitoring service delivery | | |
| Learning deliver methods | On the job coaching or monitoring Problem solving Presentation/demonstration | | |
| Page 152 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | | |

| Formal course participation Work experience and involvement in professional networks |
|---|
| Conference and seminar attendance |

| Evidence Guide | |
|---|--|
| Critical Aspects of Competence | Assessment requires evidence that the candidate: identified and implemented learning opportunities for others gave and received feedback constructively facilitated participation of individuals in the work of the team negotiated plans to improve the effectiveness of learning prepared learning plans to match skill needs accessed and designated learning opportunities |
| Underpinning Knowledge and Attitude | Demonstrates knowledge of: coaching and monitoring principles understanding how to work effectively with team members who have diverse work styles, aspirations, cultures and perspective understanding how to facilitate team development and improvement understanding methods and techniques to obtain and interpreting feedback understanding methods for identifying and prioritizing personal development opportunities and options knowledge of career paths and competence standards in the industry |
| Underpinning Skills | Demonstrates skills in: reading and understanding a variety of texts, preparing general information and documents according to target audience; spell with accuracy; use grammar and punctuation effective relationships and conflict management communication including receiving feedback and reporting, maintaining effective relationships and conflict management planning skills to organize required resources and equipment to meet learning needs coaching and mentoring skills to provide support to colleagues reporting to organize information; assess information for relevance and accuracy; identify and elaborate on learning outcomes facilitation to conduct small group training sessions relating to people from a range of social, cultural, physical |

| Page 153 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|-----------------|------------------------------------|--|------------------------|
|-----------------|------------------------------------|--|------------------------|

| | and mental backgrounds | | |
|--------------|---|--|--|
| Resource | Access to relevant workplace or appropriately simulated | | |
| Implications | environment where assessment can take place | | |
| Methods of | Competence may be accessed through: | | |
| Assessment | Interview / Written Test | | |
| | Observation / Demonstration with Oral Questioning | | |
| Context of | Competence may be assessed in the workplace or in a | | |
| Assessment | simulated workplace setting. | | |

| Page 154 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|-----------------|------------------------------------|--|------------------------|
|-----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | | |
|--|---|--|
| Unit Title | Utilize Specialized Communication Skills | |
| Unit Code | EIS TIM4 22 0612 | |
| Unit Descriptor | This unit covers the knowledge, skills and attitudes required to use specialized communication skills to meet specific needs of internal and external clients, conduct interviews, facilitate group discussions, and contribute to the development of communication strategies. | |

П

| Elements Performance Criteria | | | | | |
|-------------------------------|--|-------------------|--|---|-------------------------|
| 1. | Meet common and specific | n 1.1 | Specific co are identif | ommunication needs of clients and ied and met | colleagues |
| | communication needs of clier | on hts es | Different a needs of c | pproaches are used to meet comn lients and colleagues | nunication |
| | | 1.3 | Conflict is in a mann the organi | addressed promptly and in a timely er which does not compromise the zation | / way and standing of |
| 2. | Contribute to the development | 2.1 of | Strategies informatio reviewed a | s for internal and external disseminant of the seminant of t | ation of nented and |
| | communication strategies | ^{on} 2.2 | Channels reviewed i | of communication are established a egularly | and |
| | | 2.3 | Coaching | in effective communication is provid | ded |
| | | 2.4 | Work relat | ed network and relationship are ma | aintained as |
| | | 2.5 | Negotiatio where req | n and conflict resolution strategies uired | are used |
| | | 2.6 | Communic appropriat objectives | cation with clients and colleagues is e to individual needs and organizat | s ional |
| 3. | 3. Represent the organization | | When part presentation presented | ticipating in internal or external fora on is relevant, appropriately resear in a manner to promote the organiz | , ched and zation |
| | | 3.2 | Presentati a predeter | on is clear and sequential and deliv mined time | vered within |
| | | 3.3 | Appropriat | e media is utilized to enhance pres | sentation |
| | | | Differences in views are respected | | |
| | | 3.5 | Written co standards | mmunication is consistent with orga | anizational |
| Pa | Page 155 of 165 Ministry of Education Copyright | | of Education oyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |

| | | 3.6 | Inquiries are responded in a manner consistent with organizational standard |
|----|-----------------------------|-----|--|
| 4. | Facilitate group discussion | 4.1 | Mechanisms which enhance <i>effective group interaction</i> are defined and implemented |
| | | 4.2 | Strategies which encourage all group members to participate are used routinely |
| | | 4.3 | Objectives and agenda for meetings and discussions are routinely set and followed |
| | | 4.4 | Relevant information are provided to group to facilitate outcomes |
| | | 4.5 | Evaluation of group communication strategies is undertaken to promote participation of all parties |
| | | 4.6 | Specific communication needs of individuals are identified and addressed |
| 5. | Conduct interview | 5.1 | A range of appropriate communication strategies are employed in <i>interview situations</i> |
| | | 5.2 | Records of interviews are made and maintained in accordance with organizational procedures |
| | | 5.3 | Effective questioning, listening and nonverbal communication techniques are used to ensure that required message is communicated |

| Variable | Range | | |
|--------------------|---|--|--|
| Strategies | Recognizing own limitations | | |
| | Utilizing techniques and aids | | |
| | Providing written drafts | | |
| | Verbal and non-verbal communication | | |
| Effective group | • Identifying and evaluating what is occurring within an | | |
| interaction | interaction in a non-judgmental way | | |
| | Using active listening | | |
| | Making decision about appropriate words, behavior | | |
| | Putting together response which is culturally appropriate | | |
| | Expressing an individual perspective | | |
| | • Expressing own philosophy, ideology and background and | | |
| | exploring impact with relevance to communication | | |
| Types of Interview | Related to staff issues Evidential | | |
| | Routine Non-disclosure | | |
| | Confidential Disclosure | | |

| Interview situations | Establish rapport obtain facts and information Facilitate resolution of issues Develop action plans |
|-------------------------|--|
| | Diffuse potentially difficult situation |

| Evidence Guide | |
|---|--|
| Critical Aspects of Competence | Assessment requires evidence that the candidate: Demonstrated effective communication skills with clients and work colleagues accessing service Adopted relevant communication techniques and strategies to meet client particular needs and difficulties |
| Underpinning Knowledge and Values | Demonstrates knowledge of: communication process dynamics of groups and different styles of group leadership communication skills relevant to client groups |
| Underpinning Skills | Demonstrates skills to: full range of communication techniques including: active listening feedback interpretation role boundaries setting negotiation establishing empathy communication strategies communication required to fulfill job roles as specified by the organization |
| Resource Implications | Access to appropriate workplace where assessment can take place. |
| Methods of Assessment | Competence may be assessed through Interview/Written Test Direct Observation / Demonstration with Oral Questioning |
| Assessment | simulated workplace setting. |

| Page 157 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|-----------------|------------------------------------|--|------------------------|
|-----------------|------------------------------------|--|------------------------|

| Occupational Standard: Power Transmission Systems Installation and Maintenance Level IV | |
|--|--|
| Unit Title | Manage and Maintain Small/Medium Business Operation |
| Unit Code | EIS TIM4 23 0612 |
| Unit Descriptor | This unit covers the operation of day-to-day business activities in a micro or small business. The strategies involve developing, monitoring and managing work activities and financial information, developing effective work habits, and adjusting work schedules as needed. |

| Elements | | Performance Criteria | | | |
|------------------------|---|----------------------|---|--|--|
| 1. Identify daily work | | 1.1 | Work requirements for a given time period are identified taking into consideration resources and constraints | | |
| | requirements | 1.2 | Work activities are prioritized based on business needs, requirements and deadlines | | |
| | | 1.3 | If appropriate, work is allocated to relevant staff or contractors to optimize efficiency | | |
| 2. | Monitor and manage | 2.1 | People, resources and/or equipment are coordinated to provide optimum results | | |
| | work | 2.2 | Staff, clients and/or contractors are communicated within a clear and regular manner, to monitor work in relation to business goals or timelines | | |
| | | 2.3 | Problem solving techniques are applied to work situations to overcome difficulties and achieve positive outcomes | | |
| 3. | Develop effective work habits | | Work and personal priorities are identified and a balance is achieved between competing priorities using appropriate <i>time management strategies</i> | | |
| | | 3.2 | Input from <i>internal and external sources</i> is sought and used to develop and refine new ideas and approaches | | |
| | | 3.3 | Business or inquiries are responded to promptly and effectively | | |
| | | 3.4 | Information is presented in a format appropriate to the industry and audience | | |
| 4. | Interpret financial information | 4.1 | Relevant documents and reports are identified | | |
| | | 4.2 | Documents and reports are read and understood and any implications discussed with appropriate persons | | |
| | | 4.3 | Data and numerical calculations are analyzed, checked, evaluated, organized and reconciled | | |
| | | 4.4 | Daily financial records and cash flow are maintained | | |

| Page 158 of 165 Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|--|--|------------------------|
|--|--|------------------------|

| - | | | | | |
|----|---------------------------------|-----|---|--|--|
| | | 4.5 | correctly and in accordance with legal and accounting requirements | | |
| | | | Invoices and payments are prepared and distributed in a timely manner and in accordance with legal requirements | | |
| | | 4.6 | Outstanding accounts are collected or followed-up on | | |
| 5. | Evaluate work performance | 5.1 | Opportunities for improvements are monitored according to business demands | | |
| | | 5.2 | Work schedules are adjusted to incorporate necessary modifications to existing work and routines or changing needs and requirements | | |
| | | 5.3 | Proposed changes are clearly communicated and recorded to aid in future planning and evaluation | | |
| | | 5.4 | Relevant codes of practice are used to guide an ethical approach to workplace practices and decisions | | |

| Variable | Range | | | | |
|---|---|--|--|--|--|
| Resources may include: | staff money time equipment space | | | | |
| Business goals may include: | sales targets budgetary targets team and individual goals production targets reporting deadlines | | | | |
| Problem solving techniques may include: | gaining additional research and information to make better informed decisions looking for patterns considering related problems or those from the past and how they were handled eliminating possibilities identifying and attempting sub-tasks collaborating and asking for advice or help from additional sources | | | | |
| Time management strategies may include: | prioritizing and anticipating short term and long term planning and scheduling creating a positive and organized work environment clear timelines and goal setting that is regularly reviewed and adjusted as necessary breaking large tasks into smaller tasks getting additional support if identified and necessary | | | | |
| Internal and • staff and colleagues | | | | | |
| Page 159 of 165Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion June 20 | | | | | |

| external sources | • | management, supervisors, advisors or head office | | | | ffice | |
|------------------|---|--|------------------|---|--|--------------|--|
| may include: | • | relevant professionals such as lawyers, accountants | | | | accountants, | |
| | | managen | nent consultants | S | | | |
| | ٠ | professio | nal associations | S | | | |

| Evidence Guide | | | | | | |
|--|--|--|--|--|--|--|
| Critical Aspects of Competence | A person must be able to demonstrate: ability to identify daily work requirements and allocate work appropriately ability to interpret financial documents in accordance with legal requirements | | | | | |
| Underpinning Knowledge and Attitudes | Demonstration knowledge on: Federal and Local Government legislative requirements affecting business operations, especially in regard to occupational health and safety (OHS), equal employment opportunity, industrial relations and anti-discrimination technical or specialist skills relevant to the business operation relevant industry code of practice planning techniques to establish realistic timelines and priorities identification of relevant performance measures quality assurance principles and methods relevant marketing, management, sales and financial concepts methods for monitoring performance and implementing improvements structured approaches to problem solving, idea management and time management | | | | | |
| Underpinning Skills | Demonstrate skills to: interpret legal requirements, company policies and procedures and immediate, day-to-day demands communication skills including questioning, clarifying, reporting, and giving and receiving constructive feedback numeracy skills for performance information, setting targets and interpreting financial documents and reports technical and analytical skills to interpret business document, reports and financial statements and projections ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities problem solving skills to develop contingency plans using computers and software packages to record and manage data and to produce reports evaluation skills for assessing work and outcomes observation skills for identifying appropriate people, resources and to monitor work | | | | | |
| Resource | The following resources should be provided: | | | | | |
| Page 160 of 165 | Ministry of Education CopyrightPower Transmission Systems Installation and Maintenance Ethiopia Occupational StandardVersion 1 June 2012 | | | | | |

| Implications | Access to relevant workplace documentation, financial records, and equipment | | | | |
|--------------|--|--|--|--|--|
| Methods of | Competence may be assessed through: | | | | |
| Assessment | Interview / Written Test | | | | |
| | Observation/Demonstration with Oral questioning | | | | |
| Context for | Competence may be assessed in the workplace or in a | | | | |
| Assessment | simulated work environment. | | | | |

| Page 161 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|-----------------|------------------------------------|--|------------------------|
|-----------------|------------------------------------|--|------------------------|

Sector: Economic Infrastructure Sub-Sector: Power Generation, Transmission and Distribution



Ethiopia Occupational Standard

Acknowledgement

We wish to extend thanks and appreciation to the many representatives of business, industry, academe and government agencies who donated their time and expertise to the development of this occupational standard.

We would like also to express our appreciation to the Experts of EEPCo, Ministry of Education (MoE) and Engineering Capacity Building Program (ECBP) who made the development of this occupational standard possible.

This occupational standard was developed on the June 2012 at Gibe, Ethiopia.

| Page 163 of 165 | Ministry of Education Copyright | Power Transmission Systems Installation and Maintenance Ethiopia Occupational Standard | Version 1 June 2012 |
|-----------------|------------------------------------|--|------------------------|
|-----------------|------------------------------------|--|------------------------|