

Federal Democratic Republic of Ethiopia  
OCCUPATIONAL STANDARD



**POWER DISTRIBUTION  
NETWORK INFRASTRUCTURE/  
SYSTEM 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

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## UNIT OF COMPETENCE CHART

**Occupational Standard: Power Distribution Network Infrastructure/ System Installation and Maintenance**

**Occupational Code: EIS DNI**

### *NTQF Level III*

[EIS DNI3 01 0612](#)

Apply OHS Practices in the Workplace

[EIS DNI3 02 0612](#)

Apply Environment and Sustainable Energy Procedures

[EIS DNI3 03 0612](#)

Work Safely near Live Electrical Apparatus as Non-Electrical Worker

[EIS DNI3 04 0612](#)

Install and Maintain De-Energized MV Underground Polymeric Cables

[EIS DNI3 05 0612](#)

Install Electrical Equipment (Network Infrastructure)

[EIS DNI3 06 0612](#)

Maintain Electrical Equipment (Network Infrastructure)

[EIS DNI3 07 0612](#)

Dismantle, Assemble and Fabricate Electro-Technology Components

[EIS DNI3 08 0612](#)

Solve Problems in Extra-Low Voltage, Single Path Circuits

[EIS DNI3 09 0612](#)

Solve Problems in Multiple Path DC Circuits

[EIS DNI3 10 0612](#)

Solve Problems in Electromagnetic Circuits

[EIS DNI3 11 0612](#)

Inspect Overhead Structures and Electrical Apparatus (Poles and Structures)

[EIS DNI3 12 0612](#)

Use Drawings, Diagrams, Schedules and Manuals

[EIS DNI3 13 0612](#)

Install and Maintain De-Energized MV Underground Paper Insulated Cables

[EIS DNI3 14 0612](#)

Perform Straight through MV Paper Insulated to Polymeric Transition Joint

[EIS DNI3 15 0612](#)

Conduct Visual Checking and Treatment of Poles and Structures

[EIS DNI3 16 0612](#)

Locate Faults in Underground Power Cables

[EIS DNI3 17 0612](#)

Conduct High Potential Testing of Underground Power Cables

[EIS DNI3 18 0612](#)

Install, Replace and Inspect Active and Reactive Energy Meters and Associated Eqpt.

[EIS DNI3 19 0612](#)

Install and Maintain Traction Bonds

[EIS DNI3 20 0612](#)

Install and Maintain Overhead Distribution Network Infrastructure

[EIS DNI3 21 0612](#)

Install Overhead Traction Configurations

[EIS DNI3 22 0612](#)  
Maintain Overhead  
Traction Configurations

[EIS DNI3 23 0612](#)  
Install Overhead  
Traction Equipment  
and Components

[EIS DNI3 24 0612](#)  
Maintain Overhead  
Traction Equipment  
and Components

[EIS DNI3 25 0612](#)  
Operate Road Rail  
Traction Height Access  
Equipment

[EIS DNI3 26 0612](#)  
Perform Rail Traction  
Switching Operation to  
a Given Schedule

[EIS DNI3 27 0612](#)  
Install and Maintain  
Network Infrastructure  
LV and MV  
Underground Cables

[EIS DNI3 28 0612](#)  
Inspect, Maintain and  
Restore Energized LV  
Overhead Distribution  
Network Infrastructure

[EIS DNI3 29 0612](#)  
Install and Maintain  
Network Infrastructure  
Electrical Equipment

[EIS DNI3 30 0612](#)  
Apply Quality Control

[EIS DNI3 31 0612](#)  
Lead Workplace  
Communication

[EIS DNI3 32 0612](#)  
Lead Small Teams

[EIS DNI3 33 0612](#)  
Improve Business  
Practice

[EIS DNI3 34 1012](#)  
Maintain Quality System  
and Continuous  
Improvement Processes  
(Kaizen)

#### **NTQF Level IV**

[EIS DNI4 01 0612](#)  
Operate Plant and  
Equipment near Live  
Electrical Conductors/  
Apparatus

[EIS DNI4 02 0612](#)  
Implement and Monitor  
Organizational OHS  
Policies, Procedures  
and Programs

[EIS DNI4 03 0612](#)  
Implement and Monitor  
Environmental and  
Sustainable Energy  
Management Policies  
and Procedures

[EIS DNI4 04 0612](#)  
Install and Maintain  
Traction Network Wiring  
System

[EIS DNI4 05 0612](#)  
Analyze and Appraise  
Fault and Outage Data

[EIS DNI4 06 0612](#)  
Maintain Oil and Gas  
Filled Specialized  
Underground Cables

<a href="#">EIS DNI4 07 0612</a> Install and Maintain Polymeric Specialized Underground Cables	<a href="#">EIS DNI4 08 0612</a> Install and Maintain Oil and Gas Pressure System for Specialized Underground Cables	<a href="#">EIS DNI4 09 0612</a> Maintain Energized Medium Voltage Distribution Overhead Electrical Apparatus (Operating Rod & Glove)
<a href="#">EIS DNI4 10 0612</a> Design Customer Substations	<a href="#">EIS DNI4 11 0612</a> Draft and Layout Overhead and Ground Distribution Extension	<a href="#">EIS DNI4 12 0612</a> Draft and Layout Street Lighting System
<a href="#">EIS DNI4 13 0612</a> Draft and Layout Distribution Substation Minor Upgrade	<a href="#">EIS DNI4 14 0612</a> Develop LV Switching Schedule and Program	<a href="#">EIS DNI4 15 0612</a> Contribute to Coordinated MV Live Line Work
<a href="#">EIS DNI4 16 0612</a> Maintain Distribution Field Devices	<a href="#">EIS DNI4 17 0612</a> Commission Distribution Field Devices	<a href="#">EIS DNI4 18 0612</a> Respond to Technical Enquiries and Requests
<a href="#">EIS DNI4 19 0612</a> Design Overhead Distribution System Installation	<a href="#">EIS DNI4 20 0612</a> Design Distribution Substations	<a href="#">EIS DNI4 21 0612</a> Design Public Lighting System Installation
<a href="#">EIS DNI4 22 0612</a> Investigate Quality of Supply Issues	<a href="#">EIS DNI4 23 0612</a> Organize and Implement Line and Easement Surveys	<a href="#">EIS DNI4 24 0612</a> Commission Network Protection and Control System (Interdependent)
<a href="#">EIS DNI4 25 0612</a> Test and Maintain Metering Scheme	<a href="#">EIS DNI4 26 0612</a> Perform Accuracy Checks on Instrument Transformers	<a href="#">EIS DNI4 27 0612</a> Design Underground Distribution System Installation

[EIS DNI4 28 0612](#)

Plan and Organize  
Work

[EIS DNI4 29 0612](#)

Migrate to New  
Technology

[EIS DNI4 30 0612](#)

Establish Quality  
Standards

[EIS DNI4 31 0612](#)

Develop Individuals  
and Team

[EIS DNI4 32 0612](#)

Utilize Specialized  
Communication Skills

[EIS DNI4 33 0612](#)

Manage and Maintain  
Small/Medium  
Business Operation

[EIS DNI4 34 1012](#)

Manage Continuous  
Improvement System

# NTQF Level III

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<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III</b>	
<b>Unit Title</b>	<b>Apply OHS Practices in the Workplace</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI3 01 0612</u></a>
<b>Unit Descriptor</b>	This competence standard unit specifies the mandatory requirements of occupational health and safety and how they apply to the various electro technology work functions. It encompasses responsibilities for health and safety, risk Management processes at all operative levels and adherence to safety practices as part of the normal way of doing work.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare to enter a work area	<p>1.1 Instruction in hazards and risk control measures for specific work functions and work areas is obtained.</p> <p>1.2 Work area access permits are obtained from appropriate personnel according to established procedures.</p> <p>1.3 Preparations for electrical and non-electrical isolation are made to prevent creation of hazards from loss of machine/system/process control according to established procedures.</p> <p>1.4 Tools and equipment needed for the work are checked for safety and correct functionality according to established procedures and regulatory requirements.</p>
2. Apply safe working practices	<p>2.1 Workplace procedures and work instructions for controlling risk are followed accurately.</p> <p>2.2 Workplace procedures for dealing with accidents, fires and emergencies are followed according to work procedures and scope of responsibility and competencies.</p>
3. Follow work place procedures for hazard identification and risk control	<p>3.1 Participates actively in the consultation process with employer and other employees to identify hazards and implement and monitor control measures.</p> <p>3.2 Hazards in the work area are recognized and reported to appropriate personnel according to established procedures.</p> <p>3.3 OHS records of incidents are completed in accordance with regulatory requirements and established procedures.</p> <p>3.4 Workplace instructions and training are followed accurately within established procedures.</p>



Variable	Range
This unit shall be demonstrated in relation to:	<ul style="list-style-type: none"> <li>• Relevant Occupational Health and Safety legislation, regulations and codes of practice related to hazards present in the industry and particular workplace</li> <li>• Accepted industry work procedures and the specific safety procedures and work instructions for particular workplace.</li> </ul>

Evidence Guide	
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Critical Aspects of Competence	<p>Assessment requires evidence that the candidate able to:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Preparing to enter the workplace including, the use of work permits and clearances and isolation permissions.</li> <li>• Applying work procedures and instructions as they apply to risk control measures.</li> <li>• Dealing with accidents and emergencies within the scope of responsibility.</li> <li>• Participation in consultation processes, identifying hazards and implementing and monitoring control measures.</li> <li>• Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions</li> <li>• contribute to sustainable energy principles and practices</li> </ul> <p>Note: Ability to implement these Occupation Health and Safety measures shall be demonstrated on all occasions safety issues arise.</p>
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Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of: Occupational Health and Safety principles</p> <p>Evidence shall show an understanding of Occupational Health and Safety to an extent indicated by the following aspects</p> <ul style="list-style-type: none"> <li>• The basic legal requirements covering occupational health and safety in the workplace encompassing: <ul style="list-style-type: none"> <li>• General aims and objectives of the relevant state or territory legislation relating to OHS</li> <li>• employer and employee responsibilities, rights and obligations</li> <li>• major functions of safety committees and representatives</li> <li>• powers give to Occupational Health and Safety Inspectors</li> </ul> </li> <li>• The requirements for personal safety in the workplace encompassing: <ul style="list-style-type: none"> <li>• the safety precautions that are required to ensure personal safety in the workplace</li> <li>• potential hazards in relation to improper industrial</li> </ul> </li> </ul>
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	<p>housekeeping</p> <ul style="list-style-type: none"> <li>• sources of pollution in an engineering environment and outline control measures</li> <li>• Workplace safety check, identifying potential workplace hazards and suggested measures for accident prevention encompassing: <ul style="list-style-type: none"> <li>• safety checklist for a typical workplace environment</li> <li>• identifying and reporting potential workplace hazards</li> <li>• methods of prevention of safety hazards within a typical workplace environment</li> </ul> </li> <li>• Working safely with electrical tools or equipment encompassing: <ul style="list-style-type: none"> <li>• causes of electrical accidents and state the effects that electric shock can cause</li> <li>• purpose of circuit protection devices, such as fuses, circuit breakers and Residual Current Devices (RCDs)</li> <li>• safe isolation of an electrical supply</li> </ul> </li> <li>• Emergency procedures for the rescue of an electric shock victim equipment</li> <li>• Emergency First Aid for an electric shock victim</li> </ul> <p>Note: Emergency First Aid is limited to first-on-the scene assistance to a victim of electric shock, and basics of CPR.</p>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• safe working practices and applying OHS practices</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III	
Unit Title	Apply Environment and sustainable energy Procedures
Unit Code	<a href="#">EIS DNI3 02 0612</a>
Unit Descriptor	This 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 sustainable energy	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the implementation of <b>environmental</b> and sustainable energy procedures are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>1.4 Environmental and sustainable energy procedures are identified, prioritized and combined within relevant projects, following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>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.</p> <p>1.6 Relevant work permits are obtained to access and perform work according to environmental and sustainable energy procedures, requirements and/or established procedures.</p> <p>1.7 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.</p> <p>1.8 Relevant personnel at worksite are confirmed current in</p>

	<p>environmental and sustainable energy procedures and other related work procedures according to requirements.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p> <p>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.</p> <p>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.</p>		
<p>2. Carry out environmental and sustainable energy procedures</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>2.4 Relevant environmental procedures are applied to a specific project(s)/site(s).</p> <p>2.5 Work is conducted in accordance with the principles of sustainable energy and energy conservation.</p> <p>2.6 Provision for the re-cycling or re-use of materials is undertaken where possible.</p> <p>2.7 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.</p> <p>2.8 Unplanned events in the implementation of environmental and sustainable energy procedures are undertaken within the scope of established procedures.</p> <p>2.9 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills on environmental and sustainable energy procedures.</p> <p>2.10 On-going checks of quality of the work are undertaken in</p>		
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	accordance with instructions and established procedures.
3. Complete the environmental and sustainable energy procedures	<p>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.</p> <p>3.2 <b>Accidents and/or injuries</b> are reported in accordance with requirements/established procedures, where applicable.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified.</p>

Variable	Range
Specific project(s)/site(s)	<p>may include, but is not limited to:</p> <ul style="list-style-type: none"> <li>• buildings</li> <li>• plants construction and maintenance sites</li> <li>• workshops</li> <li>• laboratories</li> <li>• catchments</li> <li>• flood plains irrigation sites</li> <li>• wetlands</li> <li>• drainage sites</li> <li>• waste disposal sites</li> <li>• easements</li> </ul>
Environmental risks	<p>may include:</p> <ul style="list-style-type: none"> <li>• impact of mismanagement of chemicals</li> <li>• impact of mismanagement of biological agents</li> <li>• detrimental impact on limited water resources</li> <li>• spillage</li> <li>• waste disposal</li> <li>• detrimental impact on water catchment areas (urban and non-urban)</li> </ul>

	<ul style="list-style-type: none"> <li>• detrimental impact on rivers</li> <li>• waterways and channels</li> <li>• unsatisfactory trade waste treatment and disposal processes</li> <li>• poor construction processes</li> <li>• planning deficiencies</li> <li>• neglect of sustainable energy principles</li> </ul>
Environmental legislation	<p>may include:</p> <ul style="list-style-type: none"> <li>• relevant federal legislation</li> <li>• relevant local government by-laws</li> <li>• relevant government or quasi government policies and regulations</li> <li>• relevant community planning and development agreements (e.g. land care agreements)</li> </ul>
Incidents of environmental impact	<p>may include:</p> <ul style="list-style-type: none"> <li>• emissions to air</li> <li>• releases to/of water</li> <li>• releases to land</li> <li>• vibration and noise</li> <li>• disposal of waste</li> <li>• contamination of land</li> <li>• impact on communities</li> <li>• destruction of habitat</li> <li>• use of energy sources</li> <li>• waste generation processes and technologies</li> <li>• impact on culturally significant sites; and</li> <li>• may involve the implementation of emergency responses</li> </ul>
Environmental management documentation	<p>may include:</p> <ul style="list-style-type: none"> <li>• information on applicable environmental laws or other requirements</li> <li>• complaint records</li> <li>• training records</li> <li>• process information</li> <li>• process operational log books</li> <li>• inspection</li> <li>• maintenance and calibration records</li> <li>• relevant contractor and supplier information</li> <li>• incident reports</li> <li>• information on emergency preparedness and response</li> <li>• records of significant environmental impacts</li> <li>• chain of custody and compliance records</li> <li>• audit results</li> <li>• management reviews</li> </ul>

<p>The following constants and variables included in this unit:</p>	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards and Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• OHS practices and OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
<p>Critical Aspects of Competence</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement occupational health and safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
<p>Underpinning Knowledge and Attitudes</p>	<p>Demonstrates knowledge to:</p> <ul style="list-style-type: none"> <li>• applying environmental and sustainable energy procedures</li> <li>• Occupational Health and Safety principles</li> <li>• Environmental Fundamentals</li> </ul>
<p>Underpinning Skills</p>	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Material handling and the environment</li> <li>• Filtering and sampling oil and the environment</li> <li>• Enterprise specific - OHS instructions</li> </ul>
<p>Resources Implication</p>	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>

Methods of Assessment	Competence may be assessed through: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.



<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III</b>	
<b>Unit Title</b>	<b>Work Safely near Live Electrical Apparatus as Non-Electrical Worker</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI3 03 0612</u></a>
<b>Unit Descriptor</b>	This unit covers compliance with working safely up to the defined “safe approach distance” near energized electrical apparatus (inc. 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 State or Territory 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 and mechanical apparatus.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare to work safely near live electrical apparatus as nonelectrical worker	<p>1.1 Instructions related to the work to be performed safely near live electrical apparatus as non-electrical worker are received and confirmed.</p> <p>1.2 Relevant requirements and established procedures to be followed and, relevant personnel to be communicated with for the work to be performed are identified.</p> <p>1.3 OHS policies and procedures to be followed for the work to be performed are received and confirmed.</p> <p>1.4 Suggestions to assist in meeting the safety requirements for working near live electrical apparatus as a non-electrical worker are made to others involved in the work.</p> <p>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.</p> <p>1.6 Scope of responsibility and process of relevant work permit(s) issue is identified, received and confirmed according to requirements and established procedures.</p> <p>1.7 Relevant responsibility associated with first aid, safety observers and/or other related work safety procedures at the worksite are identified in accordance with requirements</p>

	<p>and established procedures to ensure safety measures are followed in the instance of an incident.</p> <p>1.8 Processes for identifying and reporting client issues to appropriate personnel in accordance with industry/acceptable /community standards are identified.</p> <p>1.9 Site and the work schedule to be prepared are confirmed according to given instructions for a quality outcome and to minimize risk and damage to property, commerce, stock and individuals in accordance and established procedures.</p> <p>1.10 Electricity infrastructure assets, related voltages and requirements for working safely near live electrical apparatus as non-electrical worker are identified.</p> <p>1.11 Safe approach distances including any zones thereof that may apply, as defined in industry guidelines, requirements and/or established procedures for the intended work are confirmed.</p>		
<p>2. Carry out the work safely near live electrical apparatus as non-electrical worker.</p>	<p>2.1 OHS principles and practices to reduce the incidents of accidents are identified in accordance with given instructions, requirements and/or established procedures.</p> <p>2.2 Working safely and complying with all safety requirements for working near live electrical apparatus as a non-electrical worker are followed in accordance with given instructions and established routines/procedures.</p> <p>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.</p> <p>2.4 Non-routine events are referred to the immediate authorized personnel for directions according to established procedures.</p> <p>2.5 Unexpected events associated with working safely near live electrical apparatus as a non-electrical worker are responded to using acquired known solutions and skills related to routine procedures to ensure work instructions and established procedures are met.</p>		
<p>3. Complete the work safely near live electrical apparatus as non-electrical worker.</p>	<p>3.1 Work schedule and anomalies for completion and checking of the work are reported to authorize personnel in accordance with established procedures.</p> <p>3.2 Processes for reporting to authorized personnel accidents and/or incidents are confirmed in accordance with established procedures.</p> <p>3.3 Requirements for returning work permit(s) and/or access authorization permits are confirmed.</p> <p>3.4 Appropriate personnel are notified of work completion according to established procedures.</p>		
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	3.5 Works completion records, report forms/data sheets are completed accurately in accordance with given instructions and established procedures.
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Variable	Range
This unit shall/may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>• safe working so defined by relevant State or Territory regulatory agencies/bodies, local government legislation,</li> <li>• Industry bi-partite body – guidelines/codes of practices or other related requirements for Safe work and access near live electrical apparatus.</li> <li>• Work functions that may be performed , such as: <ul style="list-style-type: none"> <li>• vegetation control</li> <li>• operation of cranes</li> <li>• elevating work platforms</li> <li>• excavators</li> <li>• concrete pumps, etc.</li> <li>• scaffolding</li> <li>• rigging</li> <li>• painting, and/or</li> <li>• any other activity that requires working safely and complying with requirements and/or established procedures near live electrical apparatus by a non-electrical worker/</li> </ul> </li> <li>• Working safely up to the defined “safe working zone” near energized electrical apparatus (inc. 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”.</li> <li>• Safe use of plant, equipment and tools within electrical environments including but not limited by: <ul style="list-style-type: none"> <li>• the electricity supply infrastructure assets,</li> <li>• infrastructure constructions and excavations including an understanding of safe approach distances zones/Safe Working Clearance,</li> <li>• work permit(s) and/or access authorization permits,</li> <li>• technical standards and Industry Guidelines,</li> <li>• rural applications,</li> <li>• road construction,</li> <li>• pavements and effect of inclement weather</li> </ul> </li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons</li> <li>• Appropriate authorities</li> <li>• Assessing risk</li> <li>• Authorization</li> <li>• Drawings and specifications</li> <li>• Emergency</li> </ul>

	<ul style="list-style-type: none"> <li>• Established procedures</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Legislation</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
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Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement occupational health and safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
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Underpinning Knowledge and Attitudes	<ul style="list-style-type: none"> <li>• Demonstrates knowledge of:</li> <li>• Basic electrical principles</li> <li>• Evidence shall show an understanding of electrical principles to an extent indicated by the following aspects: <ul style="list-style-type: none"> <li>• Nature of electrical current and charge</li> <li>• Sources of electricity</li> <li>• Effects of current</li> <li>• Single-source single-load circuits encompassing: <ul style="list-style-type: none"> <li>• components that make up the circuit, and</li> <li>• relationship between voltage and current</li> <li>• Consequences of a short circuit and an open-circuit.</li> </ul> </li> <li>• Occupational health and safety principles</li> </ul> </li> <li>• Evidence shall show an understanding of occupational health and safety to an extent indicated by the following aspects <ul style="list-style-type: none"> <li>• The basic legal requirements covering occupational health and safety in the workplace encompassing: <ul style="list-style-type: none"> <li>• General aims and objectives of the relevant state or territory legislation relating to OHS.</li> <li>• employer and employee responsibilities, rights and obligations</li> <li>• major functions of safety committees and representatives</li> <li>• powers give to occupational health and safety Inspectors</li> </ul> </li> <li>• The requirements for personal safety in the workplace encompassing: <ul style="list-style-type: none"> <li>• the safety precautions that are required to ensure personal safety in the workplace</li> <li>• potential hazards in relation to improper industrial</li> </ul> </li> </ul> </li> </ul>
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	<p>housekeeping</p> <ul style="list-style-type: none"> <li>• sources of pollution in an engineering environment and outline control measures</li> <li>• Workplace safety check, identifying potential workplace hazards and suggested measures for accident prevention encompassing: <ul style="list-style-type: none"> <li>• safety checklist for a typical workplace environment</li> <li>• identifying and reporting potential workplace hazards</li> <li>• methods of prevention of safety hazards within a typical workplace environment</li> </ul> </li> <li>• Working safely with electrical tools or equipment encompassing: <ul style="list-style-type: none"> <li>• causes of electrical accidents and state the effects that electric shock can cause</li> <li>• purpose of circuit protection devices, such as fuses, circuit breakers and Residual Current Devices (RCDs)</li> <li>• safe isolation of an electrical supply</li> <li>• Emergency procedures for the rescue of an electric shock victim equipment</li> <li>• Emergency First Aid for an electric shock victim</li> </ul> </li> </ul> <p>Note: Emergency first aid is limited to first-on-the scene assistance to a victim of electric shock , and</p> <ul style="list-style-type: none"> <li>• basics of CPR</li> <li>• Electrical safe working practice</li> <li>• 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: <ul style="list-style-type: none"> <li>• Risk management and assessment of risk encompassing: <ul style="list-style-type: none"> <li>• Principle and purpose of risk management</li> <li>• Processes for conducting a risk assessment</li> </ul> </li> <li>• Hazards associated with low-voltage, extra-low voltage and high-currents encompassing: <ul style="list-style-type: none"> <li>• Arrangement of power distribution and circuits in an electrical installations</li> <li>• Parts of an electrical system and equipment that operate at low-voltage and extra low voltage</li> <li>• Parts of an electrical system and equipment where high-currents are likely.</li> </ul> </li> <li>• Risks and control measures associated with high-voltage encompassing: <ul style="list-style-type: none"> <li>• Parts of an electrical system and equipment that operate at high-voltage,</li> <li>• The terms ‘touch voltage’, ‘step voltage’, ‘induced voltage’ and ‘creep age’ as they relate to the hazards of high-</li> </ul> </li> </ul> </li> </ul>		
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	<p>voltage, and</p> <ul style="list-style-type: none"> <li>• Control measures used for dealing with the hazards of high-voltage.</li> <li>• Optical fiber safety encompassing: <ul style="list-style-type: none"> <li>• Coherent optical sources and joining procedures</li> <li>• Laser safety class 3a devices or their replace</li> <li>• Risks and control measures associated with low voltage encompassing: <ul style="list-style-type: none"> <li>• Risks associated with modifying electrical installations, fault finding, maintenance and repair</li> <li>• Control measures before, while and after working on electrical installations, circuits or equipment</li> <li>• Isolation and tagging-off procedures</li> <li>• Risks and restrictions in working live</li> <li>• Control measures for working live.</li> </ul> </li> <li>• Risks and control measures associated with harmful dusts and airborne contaminants.</li> <li>• Note: Sources include thermal insulation, fibrous cement materials and asbestos and other fiber reinforced switchboard materials.</li> <li>• Safety, selection, use, maintenance and care of test equipment encompassing: <ul style="list-style-type: none"> <li>• Safety characteristics of electrical testing devices</li> <li>• Safe use of electrical testing device</li> <li>• Checks and storage methods for maintaining the safety of testing devices.</li> </ul> </li> <li>• Transmission, distribution and rail power systems</li> <li>• Evidence shall show an understanding of transmission, distribution and rail systems to an extent indicated by the following aspects: <ul style="list-style-type: none"> <li>• Relationship between the transmission, distribution and rail system within an overall power system</li> </ul> </li> </ul> <p>Note: Examples include different organizations responsible for generation, transmission, distribution and rail and, how they correlate and their functions</p> <ul style="list-style-type: none"> <li>• Characteristics of a transmission, a distribution and a rail system</li> </ul> <p>Note: Examples include principal components, typical voltage levels and methods of transmission</p> <ul style="list-style-type: none"> <li>• and distribution including grid type transmission systems, radial, parallel and ring main feeders</li> <li>• Relationship between an overhead and underground supply systems within an overall power system</li> <li>• Note: Examples include advantages/disadvantages, applications and the basic steps for planning and installing an overhead and underground distribution system</li> <li>• Single line drawings and layouts</li> <li>• Note: Examples of drawings and layouts of transmission and distribution systems including, radial, parallel and ring</li> </ul> </li></ul>
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	<p>main feeders and the MV equipment associated with substations</p> <ul style="list-style-type: none"> <li>• Fundamentals for working safely near live electrical apparatus</li> <li>• Evidence shall show an understanding of working safely up to the defined “safe working zone” near energized electrical apparatus (inc. electrical power lines) for non-electrical worker to an extent indicated by the following aspects:</li> <li>• Standards, guidelines/codes of practice, State/Territory/local government legislation, supply authority regulations and or enterprise 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 non-electrical worker</li> <li>• Definitions of terminologies</li> </ul> <p>Note: Examples include ‘safe working zone’ ‘risk assessment’, ‘safe approach distances zones’, ‘safe working distances’, ‘work permits’, access authorization permits’, ‘Technical standards’</p> <ul style="list-style-type: none"> <li>• ‘isolation procedures’ and compliance requirements’</li> <li>• OHS policies and procedures for working safely encompassing: <ul style="list-style-type: none"> <li>• Emergency response and first aid procedures such as CPR</li> <li>• Roles and responsibilities of employers, employees and other parties under OHS legislation</li> <li>• Personal protective equipment</li> <li>• Identifying hazards, assessing and controlling OHS risks</li> <li>• First aid procedures</li> <li>• Duties of a safety observer</li> <li>• Working at heights/confined spaces</li> <li>• Permit to work systems and isolation procedures</li> <li>• Safe application of different types of tools and equipment</li> <li>• Operation of mobile plant and machinery (e.g. EWP) near live electrical apparatus</li> <li>• Electricity supply infrastructure assets and voltages</li> <li>• Techniques and precautions in undertaking different work functions and working safely up to the defined “safe working zone” near energized electrical apparatus (inc. electrical power lines) for non-electrical worker</li> </ul> </li> <li>• Note: Examples of work functions that may be performed include, vegetation control, scaffolding, rigging, painting, and/or any other activity that requires working safely near live electrical apparatus</li> <li>• by a non-electrical worker</li> </ul>		
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• confirmation of the “safe working zone” for safe work and access near live electrical and mechanical apparatus</li> <li>• identification of the relevant technical standards, acts,</li> </ul>		
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	<p>regulations and codes/guidelines</p> <ul style="list-style-type: none"> <li>• identification of established (enterprise) procedures</li> <li>• confirmation of the principles of electricity, the three phase power system, electric shock and resuscitation, power system</li> <li>• recognition of aerial voltage systems</li> <li>• identification of low voltage</li> <li>• aerial circuits</li> <li>• identification of medium voltage</li> <li>• procedures in the event of an incident</li> <li>• events constituting an incident</li> <li>• procedures for responding to incidents</li> <li>• hazard and risk assessment procedure</li> <li>• conduct work-site hazard assessment</li> <li>• confirmation of essential components of hazard assessment checks</li> <li>• applying hazard identification in electrical work</li> <li>• confirmation of the basic safety principles for work on</li> <li>• electrical works hazard identification and risk</li> </ul>
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: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.



Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III	
Unit Title	Install and Maintain De-Energized MV Underground Polymeric Cables
Unit Code	<a href="#">EIS DNI3 04 0612</a>
Unit Descriptor	This unit covers the installation and maintenance of de-energized Medium voltage underground polymeric cables and covers the jointing, terminating, repair and replacement of cables. It includes the isolation of systems and circuits, the procedure of issuing/accepting electrical access permits, the undertaking of pre-commissioning and/or re-commissioning tests and the updating of system data/ maintenance records.

Elements	Performance Criteria
1. Prepare to the installation and maintenance of de energized MV underground polymeric cables	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the installation and maintenance of de-energized MV underground polymeric cables are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>1.4 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>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.</p> <p>1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.</p> <p>1.7 Resources including personnel, equipment, tools and personal protective <b>equipment required</b> for the job are obtained and confirmed in working order.</p> <p>1.8 Relevant personnel at work site are confirmed current in First Aid and other related work procedures according to requirements.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p>

	<p>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.</p> <p>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.</p> <p>1.12 Road signs, barriers and warning devices are positioned in accordance with requirements.</p>		
<p>2. Carry out the installation and maintenance of de energized MV underground polymeric cables</p>	<p>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</p> <p>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.</p> <p>2.3 System Installation and circuits are isolated as required, proved safe to work on in accordance with the requirements/permits and established procedures.</p> <p>2.4 Apply essential knowledge and associated skills in the safe <b>installation and maintenance of de energized MV underground polymeric cables to ensure completion in an agreed timeframe</b> and, to quality standards with a minimum of waste according to requirements.</p> <p>2.5 De-energized MV underground polymeric cables are installed according the work schedule and requirements/established procedures.</p> <p>2.6 Maintenance, including repair and/or replacement of de-energized MV underground polymeric cables is carried out, in accordance with the work schedule and requirements/established procedures.</p> <p>2.7 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.</p> <p>2.8 Unplanned events in the installation and maintenance of de-energized MV underground polymeric cables are undertaken within the scope of established procedures.</p> <p>2.9 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.</p> <p>2.10 On-going checks of quality of the work are undertaken in accordance with instructions and established procedures.</p>		
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<p>3. Complete the installation and maintenance of de energized MV underground polymeric cables</p>	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.</p> <p>3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.</p> <p>3.3 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.</p> <p>3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.5 Relevant work permit(s) are signed off and, MV underground polymeric cables are returned to service in accordance with requirements.</p> <p>3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified.</p>
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Variable	Range
<p>This unit shall/may be demonstrated in relation to:</p>	<ul style="list-style-type: none"> <li>• the installation and maintenance of de-energized Medium voltage</li> <li>• underground polymeric cables and covers the jointing,</li> <li>• terminating, repair and replacement of cables used in systems and circuits and the issuing/accepting of relevant permits</li> </ul>
<p>Underground equipment</p>	<p>may include:</p> <ul style="list-style-type: none"> <li>• links, fuses, ring main units, distribution fuse boxes, pad mount and ground transformers, chamber substations and bus bar/termination boxes</li> </ul>
<p>Test and recording equipment includes</p>	<ul style="list-style-type: none"> <li>• voltage detectors</li> <li>• cable identification equipment</li> <li>• cable spiking equipment and</li> <li>• insulation resistance testers</li> </ul>
<p>Jointing and terminating materials include:</p>	<ul style="list-style-type: none"> <li>• compound and resin filled boxes</li> <li>• polymeric tape materials</li> <li>• polymeric heat shrink materials</li> <li>• "slip-on" molded components and pre-stretched polymeric materials</li> <li>• compression and mechanical connectors</li> </ul>
<p>Jointing and terminating locations include:</p>	<ul style="list-style-type: none"> <li>• circuit breakers</li> <li>• links and fuses</li> <li>• ring main units</li> <li>• distribution fuse boxes</li> <li>• pad mount and ground transformers</li> <li>• chamber substations and bus bar/termination boxes</li> </ul>

<p>The following constants and variables included in this unit:</p>	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation and MSDS</li> <li>• Notification</li> <li>• OHS practices and OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements.</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
<p>Critical Aspects of Competence</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement occupational health and safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
<p>Underpinning Knowledge and Attitudes</p>	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• installing and maintaining de-energized MV underground polymeric cables</li> <li>• MV polymeric underground cable jointing principles</li> </ul>
<p>Underpinning Skills</p>	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• MV polymeric underground cable jointing</li> </ul>

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: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III</b>	
<b>Unit Title</b>	<b>Install Electrical Equipment (Network Infrastructure)</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI3 05 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the installation of electrical equipment, such as fuse switches, drops out switches, sectionalizers, links, surge arrestors, gas filled and or oil filled switches, which are relevant to the transmission, distribution and rail networks. It includes the termination/connection of the equipment in accordance to enterprise requirements; the relevant pre-commissioning tests involving the equipment/system and the interpretation of these tests against agreed specifications.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare for the installation of electrical equipment (network infrastructure)	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the installation of electrical equipment (network infrastructure) are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>1.4 Work is prioritized and sequenced following consultation with others for completion with unacceptable timeframes and in accordance with established procedures.</p> <p>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.</p> <p>1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.</p> <p>1.7 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.</p> <p>1.8 Relevant personnel at worksite are confirmed current in First Aid, Pole Top Rescue and other related work procedures according to requirements.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p>

	<p>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.</p> <p>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.</p> <p>1.12 Road signs, barriers and warning devices are positioned in accordance with requirements.</p>
<p>2. Carry out installation of electrical equipment (network infrastructure)</p>	<p>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.</p> <p>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.</p> <p>2.3 Apply essential knowledge and associated skills in the safe installation of electrical equipment (network infrastructure) to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.4 Electrical equipment and associated hardware is positioned, secured and terminated/connected in accordance with requirements and established procedures.</p> <p>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.</p> <p>2.6 Unplanned events in the installation of electrical equipment (network infrastructure) are undertaken within the scope of established procedures.</p> <p>2.7 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.</p> <p>2.8 On-going checks of quality of the work are undertaken in accordance with instructions and established procedures.</p>
<p>3. Complete the installation of electrical equipment (network infrastructure)</p>	<p>3.1 Work undertaken is checked/ tested against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.</p> <p>3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.</p> <p>3.3 Work site is rehabilitated, cleaned up and made safe in</p>

	<p>accordance with established procedures.</p> <p>3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.5 Relevant work permit(s) are signed off and, electrical equipment (network infrastructure) are returned to service in accordance with requirements.</p> <p>3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified.</p>
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Variable	Range
This unit shall/may be demonstrated in relation to the:	<ul style="list-style-type: none"> <li>• installation,</li> <li>• termination/connection of overhead electrical equipment relevant to the transmission,</li> <li>• distribution and rail networks, and includes pre-commissioning</li> </ul>
Electrical equipment and associated hardware may include:	<ul style="list-style-type: none"> <li>• relevant transmission or distribution line work/network;</li> <li>• switchgear (e.g. re closers, sectionalizes,</li> <li>• drop-out fuses</li> <li>• disconnections</li> <li>• isolators</li> <li>• air break switches</li> <li>• gas filled switches</li> <li>• links</li> <li>• fuses</li> <li>• fuse switches and circuit breakers)</li> <li>• transformers (e.g. pad mount, pole-mounted and mobile)</li> <li>• reactors</li> <li>• fault indicators</li> <li>• regulators</li> <li>• street lighting control points</li> <li>• capacitors</li> <li>• cables</li> <li>• underground/overhead cable terminations</li> <li>• relays (simple); mobile generators and surge arrestors support brackets and the like</li> </ul>
the installation, termination/connection of overhead electrical	<ul style="list-style-type: none"> <li>• the energisation of equipment in a highly complex,</li> <li>• Interdependent and interconnected electricity supply Network systems, where the effects of unintended consequences on the system are high risk and appropriate</li> </ul>



<p>equipment relevant to the transmission, distribution and rail networks, and includes pre-commissioning does not include:</p>	<p>personnel effect energisation.</p>
<p>Test and recording equipment includes:</p>	<ul style="list-style-type: none"> <li>• voltage detectors,</li> <li>• phasing equipment,</li> <li>• tong ammeters,</li> <li>• voltmeters,</li> <li>• recording meters and insulation resistance testers used for the purposes as intended and according to requirements, and does not include: <ul style="list-style-type: none"> <li>• Use of such in energizing installed equipment in a highly complex, interdependent and interconnected electricity supply Network system, where the effects of unintended consequences on the system are high risk.</li> </ul> </li> </ul>
<p>The following constants and variables included in this unit:</p>	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> </ul>

	<ul style="list-style-type: none"> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• implement occupational health and safety workplace procedures and practices including the use of risk control measures</li> <li>• apply sustainable energy principles and practices</li> <li>• conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• installing electrical equipment (network infrastructure)</li> <li>• Alternating current principles - power</li> <li>• Magnetism</li> <li>• Electromagnetic principles</li> <li>• Engineering applications of mathematical principles</li> <li>• Engineering applications of mechanical principles</li> <li>• Engineering applications of material properties</li> <li>• Stores procedures</li> <li>• Substations, power transformers and reactors</li> <li>• Power line safety practices</li> <li>• Switchgear installation</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• installing electrical equipment (network infrastructure) practices</li> <li>• installing electrical equipment (network infrastructure)</li> <li>• Transmission, distribution and rail power systems</li> <li>• Generation power systems</li> <li>• Basic rigging techniques</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III	
Unit Title	Maintain Electrical Equipment (Network Infrastructure)
Unit Code	<a href="#">EIS DNI3 06 0612</a>
Unit Descriptor	This unit covers the maintenance of electrical equipment and associated hardware, such as fuse switches, drop out switches, sectionalizers, links, surge arrestors, gas filled and or oil filled switches, relevant to the transmission, distribution and rail traction networks and includes the repair and/or replacement of “like for like” electrical equipment and associated hardware as well as the termination and/or connection of this equipment according to requirements and may include sampling of insulating oils. It also encompasses the identification of faults, the pre commissioning tests involving the equipment/ system and the interpretation of these tests against agreed specifications. It excludes the energisation of the equipment maintained in a highly complex, interdependent and interconnected electricity supply Network system, where the affects of unintended consequences on the system are high risk and appropriate personnel effect energisation.

Elements	Performance Criteria
1. Prepare for the maintenance of electrical equipment (network infrastructure)	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures the <b><i>maintenance of electrical equipment (network infrastructure)</i></b> are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>1.4 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>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.</p> <p>1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.</p>

	<p>1.7 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.</p> <p>1.8 Relevant personnel at worksite are confirmed current in First Aid, Pole Top Rescue and other related work procedures according to requirements.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p> <p>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.</p> <p>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</p> <p>1.12 Road signs, barriers and warning devices are positioned in accordance with requirements.</p>
<p>2. Carry out maintenance of electrical equipment (network infrastructure)</p>	<p>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.</p> <p>2.2 Lifting, climbing, working in confined spaces and aloft, and use of power <b>tools/equipment</b>, techniques and practices are safely followed and, currency according to requirements confirmed.</p> <p>2.3 Apply essential knowledge and associated skills in the safe maintenance of electrical equipment (network infrastructure) to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.4 <b>Maintenance</b>, including repair and/or replacement of electrical equipment (network infrastructure) is carried out, in accordance with the work schedule and requirements/established procedures.</p> <p>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.</p> <p>2.6 Unplanned events in the maintenance of electrical equipment (network infrastructure) are undertaken within the scope of established procedures.</p> <p>2.7 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.</p>

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

Variable	Range
This Competence Standard Unit shall/may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>the maintenance of overhead electrical equipment relevant to the transmission, distribution and rail networks</li> </ul>
Maintenance	<p>may:</p> <ul style="list-style-type: none"> <li>Include the removal, repair and replacement of electrical equipment encompassing "like for like" and associated hardware as well as the termination and/or connection of this equipment according to requirements and may include sampling of insulating oils.</li> <li>also encompass: <ul style="list-style-type: none"> <li>the identification of faults;</li> <li>The pre-commissioning tests involving the equipment/ system and the interpretation of these tests against agreed specifications.</li> </ul> </li> <li>exclude: <ul style="list-style-type: none"> <li>the energisation of the equipment maintained in a highly complex,</li> <li>Inter dependent and interconnected electricity supply Network systems, where the effects of unintended consequences on the system are high risk and appropriate personnel effect energisation.</li> </ul> </li> </ul>

<p>Electrical equipment and associated hardware may include:</p>	<ul style="list-style-type: none"> <li>• relevant transmission or distribution line work/network;</li> <li>• switchgear (e.g. re closers, sectionalizes,</li> <li>• drop-out fuses,</li> <li>• disconnections,</li> <li>• isolators,</li> <li>• air break switches,</li> <li>• gas filled switches,</li> <li>• links,</li> <li>• fuses,</li> <li>• fuse switches and circuit breakers);</li> <li>• transformers (e.g. pad mount, pole-mounted and mobile);</li> <li>• reactors;</li> <li>• fault indicators;</li> <li>• regulators;</li> <li>• street lighting control points;</li> <li>• capacitors;</li> <li>• cables;</li> <li>• underground/overhead cable terminations;</li> <li>• underground cable joints;</li> <li>• relays (simple);</li> <li>• mobile generators and surge arrestors;</li> <li>• support brackets and the like</li> </ul>
<p>Test and recording equipment</p>	<p>includes:</p> <ul style="list-style-type: none"> <li>• voltage detectors,</li> <li>• phasing equipment,</li> <li>• tong ammeters,</li> <li>• voltmeters,</li> <li>• recording meters,</li> <li>• insulation resistance testers and may include: <ul style="list-style-type: none"> <li>• sampling of transformers,</li> <li>• switchgear and cable insulating oil and tests for dielectric strength and moisture used for the purposes as intended and according to requirements, and does not include: <ul style="list-style-type: none"> <li>• use of such in: energizing equipment and circuits in a highly complex, interdependent and interconnected electricity supply Network system, where the effects of unintended consequences on the system are high risk</li> </ul> </li> </ul> </li> </ul>
<p>Equipment may include:</p>	<ul style="list-style-type: none"> <li>• Pump,</li> <li>• filter press,</li> <li>• hoses,</li> <li>• pipes,</li> <li>• soil kits,</li> <li>• sample bottles,</li> <li>• storage vessels etc</li> </ul>

<p>The following constants and variables included in this unit:</p>	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
<p>Critical Aspects of Competence</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
<p>Underpinning Knowledge and Attitudes</p>	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• maintaining electrical equipment (network infrastructure)</li> <li>• Filtering and sampling of insulating oil</li> <li>• Filtering and sampling oil and the environment</li> </ul>
<p>Underpinning Skills</p>	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Fuse switches Dropout fuses Sectionalizes Disconnections Links</li> </ul>

	<ul style="list-style-type: none"> <li>• Fuses Surge arrestors</li> <li>• Re closers Gas filled switches Ring main units Oil filled switches Air break switches</li> <li>• Transformers Reactors Regulators Capacitors Relays Line fault indicators</li> <li>• Voltage detectors Phasing equipment Clip-on ammeters Insulation resistance testers Recording meters Earth resistance testers</li> <li>• Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions</li> </ul>
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: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.



<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III</b>	
<b>Unit Title</b>	<b>Dismantle, Assemble and Fabricate Electro-Technology Components</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI3 07 0612</u></a>
<b>Unit Descriptor</b>	This competence standard 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.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare for dismantling, assembling and fabrication work.	<p>1.1 OHS procedures for a given work area are obtained and understood through established routines and procedures.</p> <p>1.2 Established OHS risk control measures and procedures in preparation for the work are followed.</p> <p>1.3 Safety hazard not previously identified are reported and advice on risk control measures are sought from the work supervisor.</p> <p>1.4 The nature of the work is obtained from documentation and from work supervisor to establish the scope of work to be undertaken.</p> <p>1.5 Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.</p> <p>1.6 Materials required for the work are obtained in accordance with established routines and procedures.</p> <p>1.7 Tools, equipment and measuring devices needed to carry out the work are obtained and checked for correct operation and safety.</p> <p>1.8 Cutting tools such as drills and chisels are sharpened to suit the material on which they are to be used.</p>
2. Dismantle and assemble electro technology apparatus.	<p>2.1 Established OHS risk control measures and procedures for carrying out the work are followed.</p> <p>2.2 Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.</p> <p>2.3 Appropriate tools are selected and used correctly and safely in dismantling and assembling apparatus.</p> <p>2.4 Apparatus manufacturer's dismantling and assembling guides are used where applicable.</p> <p>2.5 Components are marked or tagged during the dismantling</p>

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

Variable	Range
This unit shall be demonstrated in relation to installation, fault	<ul style="list-style-type: none"> <li>• Appliances</li> <li>• Business equipment</li> <li>• Computers</li> <li>• Data Communications</li> </ul>

finding, maintenance or development work functions in any of the following disciplines:	<ul style="list-style-type: none"> <li>• Electrical</li> <li>• Electrical Machines</li> <li>• Electronics</li> <li>• Fire protection</li> <li>• Instrumentation</li> <li>• Refrigeration and Air Conditioning</li> <li>• Renewable / sustainable energy, and</li> <li>• Security technology</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Evidence that shows a candidate is able to:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> <li>• Demonstrated consistent performance across a representative range of contexts from the prescribed items below: <ul style="list-style-type: none"> <li>• Dismantle, assemble and fabricate electro technology components including: <ul style="list-style-type: none"> <li>• 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.</li> <li>• Sharpening a drill bit for at least two different types of material.</li> <li>• Fabricating a component that requires the selection and safe use of a variety of fabrication tools.</li> <li>• Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions</li> </ul> </li> </ul> </li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Safe working practices and dismantling, assembling and fabricating electro technology components.</li> <li>• Occupational Health and Safety principles</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Safe working practices and applying OHS practices</li> <li>• Safe working practices and dismantling, assembling and fabricating electro technology components.</li> <li>• Hand tools</li> <li>• Power tools</li> <li>• Dismantling and assembling techniques</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>

Methods of Assessment	Competence may be assessed through: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III	
Unit Title	Solve Problems in Extra-Low Voltage Single Path Circuits
Unit Code	<a href="#">EIS DNI3 08 0612</a>
Unit Descriptor	This unit covers providing known solutions to predictable problems in single path circuits operated at extra-low voltage as they apply to various electro technology work functions. It encompasses working safely, problem solving procedures, including the use of basic voltage, current and resistance measuring devices, providing known solutions to predictable circuit problems.

Elements	Performance Criteria
1. Prepare to work on extra-low voltage single path electrical circuits	<p>1.1 OHS procedures for a given work area are obtained and understood.</p> <p>1.2 OHS risk control work preparation measures and procedures are followed.</p> <p>1.3 The nature of the <b>circuit(s)</b> problem is obtained from documentation or from work supervisor to establish the scope of work to be undertaken.</p> <p>1.4 Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.</p> <p>1.5 Sources of materials that may be required for the work are established in accordance with established procedures.</p> <p>1.6 Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety</p>
2. Solve problem in extra-low voltage single path electrical circuits.	<p>2.1 OHS risk control work measures and procedures are followed.</p> <p>2.2 The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.</p> <p>2.3 Circuits are checked as being isolated where necessary in strict accordance OHS requirements and procedures.</p> <p>2.4 Established routines are used to solve circuit problems using measured and calculated values as they apply to single path, single source circuits.</p> <p>2.5 Problems are solved without unnecessary damage to apparatus, circuits, the surrounding environment or services and using sustainable energy practices</p>
3. Complete work and document problem solving	<p>3.1 OHS work completion risk control measures and procedures are followed.</p> <p>3.2 Work site is cleaned and made safe in accordance with</p>

activities	<p>established procedures.</p> <p>3.3 Justification for solutions used to solve circuit problems is documented.</p> <p>3.4 Work completion is documented and an appropriate person or persons notified in accordance with established routine procedures</p>
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Variable	Range
Single source parallel and series-parallel DC. circuits as they apply to problems related to:	<ul style="list-style-type: none"> <li>• installation,</li> <li>• fault finding,</li> <li>• maintenance or development work</li> <li>• functions in any of the following disciplines: <ul style="list-style-type: none"> <li>• Computers</li> <li>• Data Communications</li> <li>• Electrical</li> <li>• Electronics</li> <li>• Fire protection</li> <li>• Refrigeration and Air Conditioning, and instrumentation</li> </ul> </li> </ul>
In relation to at least two of the following types of circuit problems and on at least two occasions:	<ul style="list-style-type: none"> <li>• Determining the operating parameters of an existing circuit</li> <li>• Alternating an existing circuit to comply with specified operating parameters</li> <li>• Developing circuits to comply with a specified function and operating parameters</li> </ul>

Evidence Guide	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, policies and workplace procedures</li> <li>• Demonstrated performance across a representative range of contexts from the prescribed items below: <ul style="list-style-type: none"> <li>• Solve problems in extra-low voltage single path circuits and including: <ul style="list-style-type: none"> <li>• Determining the operating parameters of an existing circuit.</li> <li>• Altering an existing circuit to comply with specified operating parameters.</li> <li>• Developing circuits to comply with a specified function and operating parameters.</li> </ul> </li> <li>• Identifying loss of supply.</li> <li>• Dealing with unplanned events by drawing on essential</li> </ul> </li> </ul>

	knowledge and skills to provide appropriate solutions
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: <ul style="list-style-type: none"> <li>• safe working practices and solving problems in extra-low voltage single path circuits</li> <li>• Fundamental electrical principles</li> <li>• Occupational Health and Safety principles</li> </ul>
Underpinning Skills	Demonstrates skills to: <ul style="list-style-type: none"> <li>• Fundamental electrical practices</li> <li>• Occupational health and safety practices</li> </ul>
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: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III</b>	
<b>Unit Title</b>	<b>Solve Problems in Multiple Path DC Circuits</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI3 09 0612</u></a>
<b>Unit Descriptor</b>	This unit covers determining correct operation of single source DC. parallel and series-parallel circuits and providing solutions as they apply to various electro technology work functions. It encompasses working safely, problem solving procedures, including the use of voltage, current and resistance measuring devices, providing solutions derived from measurements and calculations to predictable problems in multiple path circuit.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare to work on multiple path DC. electrical circuits.	<p>1.1 OHS procedures for a given work area are obtained and understood.</p> <p>1.2 OHS risk control work preparation measures and procedures are followed.</p> <p>1.3 The nature of the circuit(s) problem is obtained from documentation or from work supervisor to establish the scope of work to be undertaken.</p> <p>1.4 Advice is sought from the work supervisor to ensure the work is co-ordinate effectively with others.</p> <p>1.5 Sources of materials that may be required for the work are established in accordance with established procedures.</p> <p>1.6 Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.</p>
2. Solve multiple path DC. circuit problems.	<p>2.1 OHS risk control work measures and procedures are followed.</p> <p>2.2 The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.</p> <p>2.3 Circuits are checked as being isolated where necessary in strict accordance OHS requirements and procedures.</p> <p>2.4 Established methods are used to solving DC. circuit problems from measure and calculated values as they apply to multiple path electrical circuit.</p> <p>2.5 Unexpected situations are dealt with safely and with the approval of an authorized person.</p> <p>2.6 Problems are solved without unnecessary damage to apparatus, circuits, the surrounding environment or services and using sustainable energy practices.</p>



3. Complete work and document problem solving activities.	<p>3.1 OHS work completion risk control measures and procedures are followed.</p> <p>3.2 Work site is cleaned and made safe in accordance with established procedures.</p> <p>3.3 Justification for solutions used to solve circuit problems is documented.</p> <p>3.4 Work completion is documented and an appropriate person or persons notified</p>
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Variable	Range
This competence standard unit shall be demonstrated in relation to:	<ul style="list-style-type: none"> <li>• Single source parallel and series-parallel DC. circuits as they apply to problems related to installation, fault finding, maintenance or development work functions in any of the following disciplines: <ul style="list-style-type: none"> <li>• Computers</li> <li>• Data Communications</li> <li>• Electrical</li> <li>• Electronics</li> <li>• Fire protection</li> <li>• Instrumentation</li> <li>• Refrigeration and Air Conditioning, and</li> </ul> </li> <li>• In relation to at least two of the following types of circuit problems and on at least two occasions: <ul style="list-style-type: none"> <li>• Determining the operating parameters of an existing circuit</li> <li>• Alternating an existing circuit to comply with specified operating parameters</li> <li>• Developing circuits to comply with a specified function and operating parameters</li> </ul> </li> </ul>

Evidence Guide	
Critical aspects of Competence	<p>Evidence that shows a candidate is able to:</p> <ul style="list-style-type: none"> <li>• Implement OHS workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> <li>• Demonstrated consistent performance across a representative range of contexts from the prescribed items below: <ul style="list-style-type: none"> <li>• Solving problems in multiple paths DC. circuits as described and including: <ul style="list-style-type: none"> <li>• Determining the operating parameters of an existing circuit.</li> <li>• Alternating an existing circuit to comply with specified operating parameters.</li> </ul> </li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• Developing circuits to comply with a specified function and operating parameters.</li> <li>• Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Safe working practices and solving problems in multiple path DC circuits.</li> <li>• Contextualized to current industry practices and technologies</li> <li>• Direct current circuit principles</li> <li>• Occupational health and safety principles</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Safe working practices and applying OHS practices</li> <li>• Contextualized to current industry practices and technologies</li> <li>• Safe working practices and solving problems in multiple paths DC circuits</li> <li>• Direct current circuit practices</li> </ul>
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	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III	
Unit Title	Solve Problems in Electromagnetic Circuits
Unit Code	<a href="#">EIS DNI3 10 0612</a>
Unit Descriptor	This unit covers determining correct operation of electromagnetic circuits and providing solutions as they apply to electrical installations and equipment. It encompasses working safely, power circuit problems solving processes, including the use of voltage, current and resistance measuring devices, providing solutions derived from measurements and calculations to predictable problems in multiple path circuit.

Elements	Performance Criteria
1. Prepare to work on electro-magnetic circuits	<p>1.1 OHS procedures for a given work area are obtained and understood.</p> <p>1.2 OHS risk control work preparation measures and procedures are followed.</p> <p>1.3 The nature of the <b>circuit(s) problem</b> is obtained from documentation or from work supervisor to establish the scope of work to be undertaken.</p> <p>1.4 Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.</p> <p>1.5 Sources of materials that may be required for the work are established in accordance with established procedures.</p> <p>1.6 Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.</p>
2. Solve multiple path electrical circuit problems	<p>2.1 OHS risk control work measures and procedures are followed.</p> <p>2.2 The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.</p> <p>2.3 Circuits are checked as being isolated where necessary in strict accordance OHS requirements and procedures.</p> <p>2.4 Established methods are used to solving circuit problems from measure and calculated values as they apply to multiple path electrical circuit.</p> <p>2.5 Unexpected situations are dealt with safely and with the approval of an authorized person.</p> <p>2.6 Problems are solved without unnecessary damage to apparatus, circuits, the surrounding environment or services and using sustainable energy practices.</p>

3. Complete work and document problem solving activities	<p>3.1 OHS work completion risk control measures and procedures are followed</p> <p>3.2 Work site is cleaned and made safe in accordance with established procedures</p> <p>3.3 Justification for solutions used to solve circuit problems is documented.</p> <p>3.4 Work completion is documented and an appropriate person or persons notified in accordance with established procedures.</p>
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Variable	Range
This unit shall be demonstrated in relation to solving problems in electromagnetic circuits by:	<ul style="list-style-type: none"> <li>• determining correct operation of electromagnetic circuits</li> <li>• providing solutions as they apply to electrical installations and equipment</li> </ul>
In relation to the following electromagnetic circuit problems on at least two occasions:	<ul style="list-style-type: none"> <li>• solving electromagnetic circuit problems,</li> <li>• using voltage, current and resistance measuring devices,</li> <li>• providing practical uses in electromagnets,</li> <li>• providing solutions derived from measurements and calculations to predictable problems in electromagnetic circuits,</li> <li>• determining the operating parameters of an existing electromagnetic circuit,</li> <li>• altering an existing electromagnetic circuit to comply with specified operating parameters,</li> <li>• listing control measures that apply to electrical devices and machines operating at low voltage</li> <li>• developing circuits to comply with a specified function and operating parameters</li> </ul>

Evidence Guide	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul> <p>Demonstrated consistent performance across a representative range of contexts from the prescribed items below:</p> <ul style="list-style-type: none"> <li>• Solve problems in electromagnetic circuits including: <ul style="list-style-type: none"> <li>▪ Determining the operating parameters of an existing electromagnetic circuit.</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>▪ Providing practical uses in electromagnets.</li> <li>▪ Listing control measures that apply to electrical devices and machines operating at low voltage</li> <li>▪ Correctly and safely using voltage, current and resistance measuring devices and providing solutions derived from measurements and calculations to predictable problems in electromagnetic circuits.</li> <li>▪ Altering an existing electromagnetic circuit to comply with specified operating parameters,</li> </ul> <ul style="list-style-type: none"> <li>• Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• safe working practices and solving problems in electromagnetic circuits</li> <li>• Electromagnetic principles</li> <li>• Hand tools</li> <li>• Occupational health and safety principles</li> <li>• Electrical safe working practice</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• safe working practices and solving problems in electromagnetic circuits</li> <li>• Electrical safe working practice</li> <li>• Occupational health and safety practices</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III	
Unit Title	Inspect Overhead Structures and Electrical Apparatus (Poles/Structures)
Unit Code	<a href="#">EIS DNI3 11 0612</a>
Unit Descriptor	This unit covers the inspection as per requirements of overhead structures such as poles and/or other structures other than towers. It also includes inspection of electrical apparatus such as, overhead conductors and or cables, underground and overhead transition points, electrical equipment, such as pole-mounted transformers, switchgear, hardware and or earthen systems. It encompasses the completion of inspection reports and other relevant documentation in accordance with requirements.

Elements	Performance Criteria
1. Prepare for the inspection of overhead structures and electrical apparatus used on poles and/or structures	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the <b>inspection</b> of overhead structures and electrical apparatus used on poles and/or structures are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>1.4 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>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.</p> <p>1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.</p> <p>1.7 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.</p> <p>1.8 Relevant personnel at worksite are confirmed current in First Aid, Pole Top Rescue and other related work procedures according to requirements.</p>

	<p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p> <p>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.</p> <p>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.</p> <p>1.12 Traffic management plan is identified and implemented.</p>
<p>2. Carry out inspection of overhead structures and electrical apparatus used on poles and/or structures</p>	<p>2.1 OHS, sustainable energy and Environmental principles and practices to reduce the incidents of accidents and minimize waste are monitored and followed in accordance with requirements and/ or established procedures</p> <p>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.</p> <p>2.3 Apply essential knowledge and associated skills in the safe inspection of overhead structures and <b>electrical apparatus</b> used on poles and/or structures to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste</p> <p>2.4 Inspection of overhead structures and electrical apparatus used on poles and/or structures is carried out, in accordance with the work schedule and requirements/established procedures.</p> <p>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.</p> <p>2.6 Unplanned events during the inspection of overhead structures and electrical apparatus used on poles and/or structures are undertaken within the scope of established procedures.</p> <p>2.7 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.</p> <p>2.8 On-going checks of quality of the work are undertaken in accordance with instructions and established procedures</p>

<p>3. Complete the inspection of overhead structures and electrical apparatus used on poles and/or structures</p>	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures</p> <p>3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable</p> <p>3.3 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.</p> <p>3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage or disposed of in accordance with established procedures.</p> <p>3.5 Relevant work permit(s) are signed off and, overhead structures and electrical apparatus used on poles and/or structures are returned to service in accordance with requirements.</p> <p>3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified.</p>
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Variable	Range
This unit shall/may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>the inspection of overhead structures such as poles and/or other structures other than towers and electrical apparatus and equipment</li> </ul>
Inspection may be carried out:	<ul style="list-style-type: none"> <li>on foot, and/or</li> <li>by conventional ground-based vehicle, or</li> <li>from the air</li> </ul>
Aircraft may be:	<ul style="list-style-type: none"> <li>helicopters or fixed-wing types</li> </ul>
Inspection techniques include:	<ul style="list-style-type: none"> <li>use of X-ray and infrared camera</li> </ul>
Items to be inspected may include:	<ul style="list-style-type: none"> <li>overhead poles and or structures, but not towers</li> </ul>
Types of electrical apparatus to be inspected include:	<ul style="list-style-type: none"> <li>overhead conductors and cables,</li> <li>underground cables and overhead transition points and,</li> <li>electrical equipment such as pole-mounted transformers and air-break switches,</li> <li>hardware, such as insulators, surge arrestors and cross-arms and or earthen systems</li> </ul>
The following constants and variables included	<ul style="list-style-type: none"> <li>Appropriate and relevant persons (see Personnel)</li> <li>Appropriate authorities</li> <li>Appropriate work platform</li> </ul>
in this unit:	<ul style="list-style-type: none"> <li>Assessing risk</li> </ul>



	<ul style="list-style-type: none"> <li>• Assessment</li> <li>• Authorization</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel.</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• implement occupational health and safety workplace procedures and practices including the use of risk control measures</li> <li>• apply sustainable energy principles and practices</li> <li>• conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• inspecting overhead structures and electrical apparatus (poles /structures)</li> <li>• Poles and structures inspection principles</li> <li>• Power line inspection principles</li> </ul>
Underpinning Skills	<p>Demonstrates skills to :</p> <ul style="list-style-type: none"> <li>• inspecting overhead structures and electrical apparatus (poles /structures)</li> <li>• Poles and structures inspection principles practices</li> <li>• Power line inspection practices</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to</p>

	information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated workplace setting.

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III</b>	
<b>Unit Title</b>	<b>Use Drawings, Diagrams, Schedules and Manuals</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI3 12 0612</u></a>
<b>Unit Descriptor</b>	This competence standard 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.

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

Variable	Range
This unit shall be demonstrated in relation to assembly, installation, fault finding, maintenance or development work functions in any of the following disciplines:	<ul style="list-style-type: none"> <li>• Appliances</li> <li>• Business equipment</li> <li>• Computers</li> <li>• Data Communications</li> <li>• Electrical</li> <li>• Electrical Machines</li> <li>• Electronics</li> <li>• Fire protection</li> <li>• Instrumentation</li> <li>• Refrigeration and Air Conditioning</li> <li>• Renewable / sustainable energy, and</li> <li>• Security technology</li> </ul>

Evidence Guide			
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> <li>• Demonstrated consistent performance across a representative range of contexts from the prescribed items below: <ul style="list-style-type: none"> <li>• Use drawings, diagrams, schedules and manuals including: <ul style="list-style-type: none"> <li>• Identifying drawings, diagrams, schedules and manuals relevant to the work to be undertaken.</li> <li>• Interpreting drawings, diagrams, schedules and manuals correctly.</li> <li>• Using correct conventions in freehand drawings.</li> <li>• Giving correct information in freehand drawings.</li> <li>• Dealing with unplanned events and drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.</li> </ul> </li> </ul> </li> </ul>		
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• safe working practices and using drawings, diagrams, schedules and manuals</li> <li>• Occupational Health and Safety principles</li> </ul>		
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• safe working practices and using drawings, diagrams, schedules and manuals</li> <li>• Drawings and diagrams</li> <li>• Occupational Health and Safety practices</li> </ul>		
Resources	Access is required to real or appropriately simulated situations,		
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Implication	including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard Power Distribution Network Infrastructure/System Installation and Maintenance Level III	
Unit Title	Install and Maintain De-Energized MV Underground Paper Insulated Cables
Unit Code	<a href="#">EIS DNI3 13 0612</a>
Unit Descriptor	This unit covers the installation and maintenance of de-energized Medium voltage underground paper insulated cables and covers the jointing, terminating, repair and replacement of cables. It includes the isolation and earthen of systems and circuits, the procedure of issuing/accepting electrical access permits, the undertaking of pre-commissioning tests as per enterprise established procedures and the updating of system data/maintenance records.

Elements	Performance Criteria
1. Prepare for the installation and maintenance of de-energized MV underground paper insulated cables	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the <b>installation and maintenance of de-energized MV underground paper insulated cables</b> are obtained and confirmed for the purposes of the work to be performed and communicated</p> <p>1.4 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures</p> <p>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.</p> <p>1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures</p> <p>1.7 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.</p> <p>1.8 Relevant personnel at work site are confirmed current in First Aid and other related work procedures according to requirements</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are</p>

	<p>resolved to carry out work where necessary.</p> <p>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</p> <p>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</p> <p>1.12 Traffic management plan is identified and implemented.</p>
<p>2. Carry out installation and maintenance of de energized MV underground paper insulated cables</p>	<p>2.1 OHS, sustainable energy and Environmental principles and practices to reduce the incidents of accidents and minimize waste are monitored and followed in accordance with requirements and/or established procedures</p> <p>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</p> <p>2.3 System Installation and circuits are isolated as required, proved safe to work on in accordance with the requirements/permits and established procedures</p> <p>2.4 Apply essential knowledge and associated skills in the safe installation and maintenance of de energized MV underground paper insulated cables to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements</p> <p>2.5 De-energized MV underground paper insulated cables are installed according the work schedule and requirements/established procedures</p> <p>2.6 Maintenance, including repair and/or replacement of de-energized MV underground paper insulated cables is carried out, in accordance with the work schedule and requirements/ established procedures</p> <p>2.7 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</p> <p>2.8 Unplanned events in the installation and maintenance of de-energized MV underground paper insulated cables are undertaken within the scope of established procedures</p> <p>2.9 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills</p> <p>2.10 On-going checks of quality of the work are undertaken in</p>

	accordance with instructions and established procedures
3. Complete the installation and maintenance of de energized MV underground paper insulated cables	<p>3.1 Work undertaken is visually checked/tested against works schedule for confirmation of phasing and conformance with requirements and, anomalies reported in accordance with established procedures</p> <p>3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.</p> <p>3.3 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.</p> <p>3.4 <b>Tools, equipment and any surplus resources and materials</b> are, where appropriate, cleaned, checked and returned to storage or disposed of in accordance with established procedures</p> <p>3.5 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage or disposed of in accordance with established procedures</p> <p>3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified</p>

Variable	Range
This unit may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>the installation and maintenance of de-energized Medium voltage underground paper insulated cables and covers the jointing, terminating, repair and replacement of cables</li> </ul>
Installation and maintenance may include:	<ul style="list-style-type: none"> <li>the repair and replacement of cables and associated hardware</li> </ul>
Types of cables includes:	<ul style="list-style-type: none"> <li>Paper-Insulated which refers to MV solid paper insulated metal sheathed.</li> </ul>
Underground equipment may include:	<ul style="list-style-type: none"> <li>links</li> <li>fuses</li> <li>ring main units</li> <li>distribution fuse boxes</li> <li>pad mount and ground transformers</li> <li>chamber substations</li> <li>bus bar/termination boxes</li> </ul>
Test and recording equipment includes:	<ul style="list-style-type: none"> <li>voltage detectors</li> <li>tong ammeters</li> <li>cable identification equipment</li> <li>cable spiking equipment and</li> <li>insulation resistance testers</li> </ul>
Jointing and terminating	<ul style="list-style-type: none"> <li>compound and resin filled boxes</li> <li>paper tape materials</li> </ul>



materials include:	<ul style="list-style-type: none"> <li>• polymeric tape materials</li> <li>• polymeric heat shrink materials</li> <li>• "slip-on" molded components and pre-stretched polymeric materials</li> <li>• compression</li> <li>• mechanical and</li> <li>• solder lugs and ferrules</li> </ul>
Jointing and terminating locations include:	<ul style="list-style-type: none"> <li>• links</li> <li>• fuses</li> <li>• ring main units</li> <li>• distribution fuse boxes</li> <li>• pad mount and ground transformers</li> <li>• chamber substations</li> <li>• bus bar/termination boxes</li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration.</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation.</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems.</li> <li>• Requirements.</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>

<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• installing and maintaining de-energized MV underground paper insulated cables</li> <li>• Alternating current circuit principles</li> <li>• Magnetism</li> <li>• Electromagnetic principles</li> <li>• MV Paper lead cable jointing principles</li> <li>• Aluminum and lead sheathed cable - jointing procedures</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Alternating current circuit practices</li> <li>• installing and maintaining de-energized MV underground paper insulated cables</li> <li>• MV Paper lead cable jointing practices</li> <li>• Power line safety practices.</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration/ with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III</b>	
<b>Unit Title</b>	<b>Perform Straight through MV Paper Insulated to Polymeric Transition Joint</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI3 14 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the formation of a MV/LV transition joint(s) from paper insulated to polymeric cable on belted and screened cables and covers the; determination of electrical values of belt papers and core insulation, protection of core and belt papers prior to setting, core setting, termination of belt papers, construction of bell mouth and moisture testing. It includes the isolation of systems and circuits, the procedure of issuing/accepting electrical access permits, the undertaking of pre commissioning and/or re-commissioning tests and the updating of system data/maintenance records.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare for the formation of a paper insulated to polymeric transition joint.	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the formation of a paper insulated to polymeric transition joint are obtained and confirmed for the purposes of the work to be performed and communicated</p> <p>1.4 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures</p> <p>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.</p> <p>1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures</p> <p>1.7 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.</p> <p>1.8 Relevant personnel at work site are confirmed current in First Aid and other related work procedures according to requirements</p>

	<p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p> <p>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</p> <p>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</p> <p>1.12 Road signs, barriers and warning devices are positioned in accordance with requirements</p>
<p>2. Carry out the formation of a paper insulated to polymeric transition joint</p>	<p>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</p> <p>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</p> <p>2.3 System Installation and circuits are isolated as required, proved safe to work on in accordance with the requirements/permits and established procedures</p> <p>2.4 Apply essential knowledge and associated skills in the safe formation of a transition paper insulated to polymeric cable joint to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements</p> <p>2.5 A transition paper insulated to polymeric cable joint is formed according the work schedule and requirements/established procedures</p> <p>2.6 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.</p> <p>2.7 Unplanned events in the formation of a transition paper insulated to polymeric cable joint are undertaken within the scope of established procedures</p> <p>2.8 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills</p> <p>2.9 On-going checks of quality of the work are undertaken in accordance with instructions and established procedures</p>

<p>3. Complete the formation of a paper insulated to polymeric transition joint</p>	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures</p> <p>3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable</p> <p>3.3 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures</p> <p>3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures</p> <p>3.5 Relevant work permit(s) are signed off and, MV/LV underground paper insulated/polymeric cables are returned to service in accordance with requirements</p> <p>3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified</p>
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Variable	Range
This unit shall/may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>• the creation of a transition joint for paper insulated to polymeric cables and covers the jointing,</li> <li>• repairing and replacement of cables used in systems and</li> <li>• circuits and the issuing/accepting of relevant permits</li> </ul>
Types of cables includes:	<ul style="list-style-type: none"> <li>• Polymeric cables (i.e. MV/LV de-energized - rigid or flexible) and Paper-Insulated Lead and</li> <li>• Aluminum sheathed cables (screened or unshielded) (copper or aluminum conductors)</li> </ul>
Jointing and terminating materials include:	<ul style="list-style-type: none"> <li>• compound and resin filled boxes,</li> <li>• paper tape materials,</li> <li>• polymeric tape materials,</li> <li>• polymeric heat shrink materials,</li> <li>• "slip-on" molded components and pre-stretched polymeric materials,</li> <li>• compression, and mechanical connectors</li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform.</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration.</li> <li>• Documenting detail work events, record keeping and or storage of information.</li> </ul>

	<ul style="list-style-type: none"> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation.</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards and Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• OHS practices and OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems.</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• performing straight through MV paper insulated to polymeric transition joints</li> <li>• MV polymeric underground cable jointing principles</li> <li>• MV paper lead cable jointing principles</li> <li>• Aluminum and lead sheathed cable - jointing procedures</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• safe working practices and applying OHS practices</li> <li>• MV polymeric underground cable jointing practices</li> <li>• MV paper lead cable jointing practices</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III</b>	
<b>Unit Title</b>	<b>Conduct Visual Checking and Treatment of Poles and Structures</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI3 15 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the conducting of ground line inspection and treatment of poles and structures in accordance with enterprise procedures. It includes work associated with testing or examining, at eye level to below ground and the visual checking above ground of the cross arm and hardware attached with the use of binoculars, so as to determine the integrity of the poles, structures and hardware attached to them. It also encompasses the completion of inspection reports and the updating of records to enterprise requirements.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare to perform visual checking and treatment of poles and structures	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the visual checking and treatment of poles and structures are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>1.4 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>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.</p> <p>1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.</p> <p>1.7 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order</p> <p>1.8 Relevant personnel at worksite are confirmed current in First Aid, Rescue and other related work procedures according to requirements.</p>

	<p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p> <p>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.</p> <p>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.</p> <p>1.12 Road signs, barriers and warning devices are positioned in accordance with requirements.</p>		
<p>2. Carry out visual checking and treatment of poles and structures</p>	<p>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.</p> <p>2.2 Lifting and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.</p> <p>2.3 Apply essential knowledge and associated skills for the safe performance of visual checking and treatment of poles and structures to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>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.</p> <p>2.5 Perform visual checking by testing or examining pole and/or structures from approximately eye level to below ground according to the requirements and established procedures.</p> <p>2.6 Defective or suspect poles are identified according to established procedures.</p> <p>2.7 Treatment of poles and/or structures is carried out, in accordance with the work schedule and requirements/established procedures.</p> <p>2.8 Unplanned events during the visual checking and treatment of poles and structures are undertaken within the scope of established procedures.</p> <p>2.9 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.</p> <p>2.10 On-going checks of quality of the work are undertaken in accordance with instructions and established procedures.</p>		
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<p>3. Complete the visual checking and treatment of poles and structures</p>	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.</p> <p>3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.</p> <p>3.3 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.</p> <p>3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.5 Relevant work permit(s) are signed off and, of poles and structures are returned to service in accordance with requirements.</p> <p>3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified.</p>
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Variable	Range
This unit may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>• the conducting of ground line inspection and treatment, including testing or examining of to determine the integrity of the poles and structures</li> </ul>
Poles and structure types include:	<ul style="list-style-type: none"> <li>• wood</li> <li>• steel</li> <li>• concrete and composite</li> </ul>
Maintenance	<p>May include:</p> <ul style="list-style-type: none"> <li>• chemical treatment</li> <li>• emergency repair or welding, or</li> <li>• life extension by re-butting or nailing</li> </ul>
Hardware attached to poles/structures include:	<ul style="list-style-type: none"> <li>• cross-arms</li> <li>• insulators, surge arrestors and</li> <li>• support brackets</li> </ul>
Inspection/testing devices	<p>May include:</p> <ul style="list-style-type: none"> <li>• electronic data capture devices</li> <li>• computers</li> <li>• sonic testing devices</li> <li>• stress tester</li> <li>• binoculars and</li> <li>• drilling tests</li> <li>• Recording and reporting systems</li> </ul>
Constants and variables are included:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> </ul>

	<ul style="list-style-type: none"> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• implement occupational health and safety workplace procedures and practices including the use of risk control measures</li> <li>• apply sustainable energy principles and practices</li> <li>• conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• conducting visual checking and treatment of poles and structures</li> <li>• Poles and structures inspection principles</li> <li>• Power line inspection principles</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• safe working practices and applying OHS practices</li> <li>• conducting visual checking and treatment of poles and structures</li> <li>• poles and structures inspection practices</li> <li>• power line inspection practices</li> </ul>

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: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III	
Unit Title	Locate Faults in Underground Power Cables
Unit Code	<a href="#">EIS DNI3 16 0612</a>
Unit Descriptor	This unit covers the diagnosis and location of faults in underground power cables. It includes obtaining the required “access to test” or equivalent permit, setting up of the fault location test equipment and following the procedure to carry out the cable fault location test plan. It also encompasses the interpreting test results, documenting the actual fault location and likely cause and, listing the recommendations for correcting the cable fault to meet client requirements.

Elements	Performance Criteria
1. Prepare to locate faults in underground power cables	<p>1.1 Works schedule(s), including cable specifications and standards, cable route data, history, and characteristics, drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection.</p> <p>1.2 <b>Relevant</b> requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 <b>OHS policies and procedures</b> related to requirements and established procedures for the location of faults in underground power cables are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>1.4 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>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.</p> <p>1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.</p> <p>1.7 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.</p> <p>1.8 <b>Test equipment</b> is assembled and checked for calibration status as per established procedures.</p> <p>1.9 <b>Cable fault</b> location test procedures/plan is prepared taking accounting the range of tests required and</p>

	<p>according to requirements/ established procedures.</p> <p>1.10 Relevant personnel at worksite are confirmed current in first aid, and other related work procedures according to requirements.</p> <p>1.11 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p> <p>1.12 Site is prepared according to the work schedule and to minimize risk and damage to property, commerce, and individuals in accordance with established procedures.</p> <p>1.13 Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.</p> <p>1.14 Road signs, barriers and warning devices are positioned in accordance with requirements.</p>
<p>2. Carry out the location of faults in underground power cables</p>	<p>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.</p> <p>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.</p> <p>2.3 Apply essential knowledge and associated skills for the safe location of faults in underground power cables, to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.4 <b>Cable</b> is tested to determine the location of the relevant faults according to the work schedule, cable fault location test procedures/plan and requirements/established procedures.</p> <p>2.5 <b>Hazard warnings</b> and safety signs are recognized and hazards and assessed OHS risks are reported to the immediate authorized persons for directions according to established procedures.</p> <p>2.6 Unplanned events in the location of faults in underground power cables are undertaken within the scope of established procedures.</p> <p>2.7 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.</p> <p>2.8 On-going checks of quality of the work are undertaken in accordance with instructions and established procedures.</p>

<p>3. Complete the location of faults in underground power cables</p>	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures <b>test results</b> are interpreted to determine the cable fault location, the type of fault and/or possible cause.</p> <p>3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.</p> <p>3.3 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.</p> <p>3.4 Tools, <b>equipment</b> and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.5 <b>Relevant</b> work permit(s) are signed off and, <b>cable/site</b> are returned to service in accordance with requirements.</p> <p>3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified.</p>
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Variable	Range		
<p>This unit may be demonstrated in relation to the diagnosis and location of faults as it relates to:</p>	<ul style="list-style-type: none"> <li>• underground power cables (Distribution and Transmission) and includes the receipt of the relevant permit(s)</li> </ul>		
<p>Relevant cable specifications and standards</p>	<p>May include but are not limited to:</p> <ul style="list-style-type: none"> <li>• cable ageing effects</li> <li>• test voltage de-rating</li> <li>• velocity of propagation</li> <li>• insulation</li> <li>• screened</li> <li>• armoured</li> <li>• burial status drawings</li> <li>• network diagrams</li> <li>• maker's installations</li> <li>• cable age and/or service history</li> <li>• owners/clients requests</li> </ul>		
<p>Cable fault test procedures</p>	<p>May include but are not limited to:</p> <ul style="list-style-type: none"> <li>• time domain reflectometry (TDR),</li> <li>• TDR radar,</li> <li>• digital arc reflection</li> <li>• differential digital arc reflection</li> <li>• current impulse test (thumper test)</li> <li>• differential current impulse</li> </ul>		
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	<ul style="list-style-type: none"> <li>• decay</li> <li>• differential decay</li> <li>• pool of potential in earth (POPIE),</li> <li>• Murray loop test (including Fisher modification)</li> <li>• radio detection</li> <li>• Varley loop test</li> <li>• capacitance inductance test</li> </ul>
Test equipment	<p>May include but are not limited to:</p> <ul style="list-style-type: none"> <li>• the calibration certificated for test equipment being current and valid for AF signals</li> <li>• bridges</li> <li>• pulse echo techniques</li> <li>• capacitors</li> <li>• seism phone</li> <li>• POPIE</li> </ul>
Hazards associated with the testing and location procedures	<p>May include but are not limited to:</p> <ul style="list-style-type: none"> <li>• environmental</li> <li>• traffic</li> <li>• chemical</li> <li>• fuel gas</li> <li>• warning notices</li> <li>• water or gas flooding</li> <li>• test voltages</li> <li>• public barriers</li> </ul>
Range of testing required	<p>May include but are not limited to:</p> <ul style="list-style-type: none"> <li>• the order in which testing will be applied, from where tests are to be applied,</li> <li>• communication arrangements and who will be directing the tests</li> </ul>
Selected test procedures	<p>May include but are not limited to:</p> <ul style="list-style-type: none"> <li>• recognized standard test methods</li> <li>• client requirements</li> </ul>
Recorded results of the tests	<p>May include but are not limited to:</p> <ul style="list-style-type: none"> <li>• the requirements specified by the client or enterprise</li> </ul>
Results interpreted	<p>May include but are not limited to:</p> <ul style="list-style-type: none"> <li>• physical location notes,</li> <li>• depth and</li> <li>• distance</li> </ul>
Identified actual fault location	<p>May include but are not limited to:</p> <ul style="list-style-type: none"> <li>• the reports and test data, within how many meters of the measured position the fault was actually located,</li> <li>• relationship between type of fault and possible cause,</li> <li>• location and protection relay operations,</li> <li>• known events related to the fault</li> </ul>
Correcting the cable fault	<p>May include but is not limited to:</p> <ul style="list-style-type: none"> <li>• providing recommendations for corrective action,</li> <li>• preventative action</li> </ul>

<p>The following constants and variables included in this unit</p>	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
<p>Critical Aspects of Competence</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
<p>Underpinning Knowledge and Attitudes</p>	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Cable fault location principles</li> <li>• Fundamentals of jointing LV polymeric cable</li> <li>• LV polymeric cable jointing principles</li> <li>• MV polymeric underground cable jointing principles</li> </ul>



	<ul style="list-style-type: none"> <li>• LV paper lead cable jointing principles</li> <li>• MV paper lead cable jointing principles</li> <li>• Underground cable construction</li> <li>• Aluminum and lead cable sheathed - jointing procedures</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• safe working practices and applying OHS practices</li> <li>• Underground cable installation</li> <li>• Cable fault location</li> <li>• MV polymeric underground cable jointing practices</li> <li>• LV paper lead cable jointing practices</li> <li>• MV paper lead cable jointing practices</li> <li>• Underground cable construction</li> </ul>
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	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III</b>	
<b>Unit Title</b>	<b>Conduct High Potential Testing of Underground Power Cables</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI3 17 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the conducting of high potential testing of underground power cables. It includes obtaining the required “access to test” or equivalent permit, setting up of the fault location test equipment and following the procedure to carry out the cable test plan. It also encompasses the interpreting test results, documenting the actual testing and, recommendations to meet client requirements.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare/plan to conduct high potential testing	<p>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.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the high potential testing are obtained and confirmed for the purposes of the work to be performed and communicated</p> <p>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.</p> <p>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.</p> <p>1.6 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.</p> <p>1.7 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.</p> <p>1.8 Clients/Customers are provided with alternative methods within the: scope, acceptable cost and requirements.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p>

	<p>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.</p> <p>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.</p> <p>1.12 Positioning of road signs, barriers and warning devices is planned in accordance with requirements.</p>
<p>2. Carry out high potential testing</p>	<p>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.</p> <p>2.2 First Aid, Pole Top Rescue and other related work procedures are performed according to requirements and/or established procedures.</p> <p>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.</p> <p>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.</p> <p>2.5 Remedial actions are taken to overcome any shortfalls encountered in the work schedule according to requirements and/or established procedures.</p> <p>2.6 Conduction of high potential testing is carried out, in accordance with the work schedule and requirements and/or established procedures</p> <p>2.7 Essential knowledge and associated skills in the safe conduction of high potential testing is applied to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.8 Solutions to non-routine problems are identified and acted using acquired essential knowledge and associated skills according to requirements.</p> <p>2.9 On-going checks of quality of the work are undertaken in accordance with requirements and established procedures and to a community/industry standard.</p>
<p>3. Complete high potential testing</p>	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures.</p>

	<p>3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.</p> <p>3.3 Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures.</p> <p>3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.5 Relevant work permit(s) are signed off and, underground cables are returned to service and advised to client/customer in accordance with requirements.</p> <p>3.6 Works completion records, reports, as installed /modified drawing(s) and/or documentation and information are confirmed, processed and appropriate personnel notified.</p>
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Variable	Range
This unit shall/may be demonstrated in relation to conducting high potential testing of underground power cables and may including the following:	<ul style="list-style-type: none"> <li>• Cable type includes: <ul style="list-style-type: none"> <li>• distribution and transmission polymeric</li> <li>• solid paper insulated</li> <li>• oil filled and</li> <li>• gas filled underground cables</li> </ul> </li> <li>• Test and recording equipment may include: <ul style="list-style-type: none"> <li>• voltage detectors</li> <li>• cable identification equipment insulation resistance</li> <li>• DC High Potential testers</li> <li>• phasing instruments</li> </ul> </li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation.</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> </ul>

	<ul style="list-style-type: none"> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification.</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Underground cable installation</li> <li>• Cable fault location principles</li> <li>• Fundamentals of jointing LV polymeric cable</li> <li>• LV polymeric cable jointing principles</li> <li>• MV polymeric underground cable jointing principles</li> <li>• LV Paper lead cable jointing principles</li> <li>• MV Paper lead cable jointing principles</li> <li>• Underground cable construction</li> <li>• Aluminum and lead sheathed cable - jointing procedures</li> <li>• Low voltage switching principles</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• safe working practices and applying OHS practices</li> <li>• Underground cable installation</li> <li>• Cable fault location practices</li> <li>• LV polymeric cable jointing practices</li> <li>• MV polymeric underground cable jointing practices</li> <li>• LV Paper lead cable jointing practices</li> <li>• MV Paper lead cable jointing practices</li> <li>• Underground cable construction</li> <li>• Low voltage switching practices</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>

Methods of Assessment	Competence may be assessed through: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III	
Unit Title	Install, Replace and Inspect Active and Reactive Energy Meters and Associated Equipment
Unit Code	<a href="#">EIS DNI3 18 0612</a>
Unit Descriptor	This unit covers the installation, replacement and inspection of whole current energy meters and associated equipment, where replacement may include the identification of faults in accordance with established procedures and return to service. It includes the requirements to ascertain if normal functions of the meters and associated equipment are in accordance with established procedures.

Elements	Performance Criteria
1. Prepare for the installation, replacement and inspection of energy meters and associated equipment	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the <b>installation and replacement</b> of energy meters and <b>associated equipment</b> are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>1.4 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>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.</p> <p>1.6 Resources including personnel, equipment, tools and personnel protective equipment required for the job are obtained and confirmed in working order.</p> <p>1.7 Relevant personnel at worksite are confirmed current in First Aid, Rescue and other related work procedures according to requirements.</p> <p>1.8 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p> <p>1.9 Site is prepared according to the work schedule and to minimize risk and damage to property, commerce, and</p>

	<p>individuals in accordance with established procedures.</p> <p>1.10 Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.</p> <p>1.11 Road signs, barriers and warning devices are positioned in accordance with requirements.</p>		
<p>2. Carry out the installation, replacement and inspection of energy meters and associated equipment</p>	<p>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.</p> <p>2.2 Lifting and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.</p> <p>2.3 Essential knowledge and associated skills are applied in the safe installation, replacement and inspection of energy meters and associated equipment to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.4 Installation and/or replacement and/or <b>inspection</b> of <b>energy meters</b> and associated equipment is carried out, including, as required, wiring, testing, programming and sealing and of meter(s) and associated equipment in accordance with requirements and enterprise requirements.</p> <p>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.</p> <p>2.6 Unplanned events during the installation, replacement and inspection of energy meters and associated equipment are undertaken within the scope of established procedures.</p> <p>2.7 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.</p> <p>2.8 On-going checks of quality of the work are undertaken in accordance with instructions and established procedures.</p>		
<p>3. Complete the installation, replacement and inspection of energy meters and associated equipment</p>	<p>3.1 Work undertaken is checked /tested against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.</p> <p>3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.</p> <p>3.3 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.</p>		
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	<p>3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.5 Works completion records, reports, as installed / modified/inspected drawing and/or documentation and information are finalized and processed and appropriate personnel notified.</p>
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Variable	Range
This unit may be demonstrated in relation to:	The installation, replacement and inspection of whole current energy meters and associated equipment, where replacement may include <ul style="list-style-type: none"> <li>the identification of faults and the return to service</li> </ul>
Installation	May include: <ul style="list-style-type: none"> <li>single and poly phase meters and associated equipment</li> </ul>
Replacement	May include: <ul style="list-style-type: none"> <li>the removal and return to service of "like for like" energy meters and associated equipment in a variety of environments and contexts</li> </ul>
Inspection may be carried out	<ul style="list-style-type: none"> <li>On foot, and/or by conventional ground-based vehicle, or from the air. Aircraft may be helicopters or fixed-wing types</li> </ul>
Associated equipment includes:	<ul style="list-style-type: none"> <li>load control devices such as time switches and audio frequency injection relays</li> <li>plug in meter bases</li> <li>service fuses and links</li> <li>contactors and meter boards and panels where the installation uses direct-wired (non-current transformer) metering</li> </ul>
Meters include:	<ul style="list-style-type: none"> <li>induction disc energy meters</li> <li>electronic energy meters</li> <li>maximum demand meters</li> <li>electronic summators</li> <li>Time switches and relays provided that they are basic direct-wired instruments. Current transformer metering is not included</li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>Appropriate and relevant persons (see Personnel)</li> <li>Appropriate authorities</li> <li>Appropriate work platform</li> <li>Assessing risk</li> <li>Assessment</li> <li>Authorization</li> <li>Confined space</li> <li>Diagnostic, testing and restoration</li> <li>Documenting detail work events, record keeping and or storage of information</li> <li>Drawings and specifications</li> </ul>

	<ul style="list-style-type: none"> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• installing replacing and inspecting energy meters and associated equipment</li> <li>• Cable protection and support</li> <li>• Cables in buildings, structures and premises</li> <li>• Basic cable and conductor terminations</li> <li>• Power cable and conductor terminations</li> <li>• Telecommunication cable and conductor terminations</li> <li>• Electronic cable and conductor terminations</li> <li>• Metering Installations</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• safe working practices and applying OHS practices</li> <li>• Cable types and applications</li> <li>• Installing, replacing and inspecting energy meters and associated equipment</li> <li>• Cables in buildings, structures and premises</li> <li>• Basic cable and conductor terminations</li> <li>• Power cable and conductor terminations</li> </ul>

	<ul style="list-style-type: none"> <li>• Telecommunication cable and conductor terminations</li> <li>• Electronic cable and conductor terminations</li> <li>• Metering Installations</li> <li>• Power line safety practices</li> </ul>
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: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III	
Unit Title	Install and Maintain Traction Bonds
Unit Code	<a href="#">EIS DNI3 19 0612</a>
Unit Descriptor	This unit covers the installation of the temporary and permanent traction bonds and bonding cables. It includes the undertaking of safe working practices on or about the running line/track. It also encompasses the isolation of systems and circuits for safe working according to work plans and the correct positioning of road signs, barriers and or warning devices and the procedure of issuing/accepting electrical permits. It also includes the visual inspection and other necessary checks to confirm that bonds, bonding cables, equipment and associated hardware have been correctly installed according to design and are in a safe condition to test prior to putting into service and/or return to service. It also includes the undertaking of pre- commissioning tests and the updating of installation data and relevant quality assurance documentation and the re- commissioning tests to ensure the integrity of the bonding system prior to a return to service and the updating of system data/maintenance records.

Elements	Performance Criteria
1. Prepare to install and for the maintenance of traction bonds	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the installation and <b>maintenance</b> of traction bonds are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>1.4 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>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.</p> <p>1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.</p>

	<p>1.7 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.</p> <p>1.8 Relevant personnel at worksite are confirmed current in CPR, first aid, and other rescue procedures according to requirements.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p> <p>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.</p> <p>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.</p> <p>1.12 Rail/road signs, barriers and warning devices are positioned in accordance with requirements.</p> <p>1.13 Environmental constraints applicable to work.</p>
<p>2. Carry out installation and maintenance of traction bonds</p>	<p>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.</p> <p>2.2 Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.</p> <p>2.3 System Installation and circuits are isolated as required, proved safe to work on in accordance with the requirements/permits and established procedures.</p> <p>2.4 Apply essential knowledge and associated skills in the safe installation, maintenance and repair of traction bonds and bonding <b>cables</b> to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.5 Cable and surrounds, including rail and other surfaces, are prepared to enable joint and terminations to be carried out according to established procedures.</p> <p>2.6 Traction bonds and maintenance are carried out according to requirements and established procedures.</p> <p>2.7 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.</p>

	<p>2.8 Unplanned events during the <b>installation and maintenance</b> of traction bonds are undertaken within the scope of established procedures.</p> <p>2.9 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.</p> <p>2.10 On-going checks of quality of the work are undertaken in accordance with instructions and established procedures.</p>
3. Complete the installation and maintenance of traction bonds	<p>3.1 Work undertaken is checked and tested against design drawings and works schedule for conformance with requirements and anomalies reported in accordance with established procedures.</p> <p>3.2 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.</p> <p>3.3 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.4 Relevant work permit(s) are signed off and, the system that has undergone the installation and maintenance of a traction bond(s) is returned to service in accordance with requirements.</p> <p>3.5 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified.</p>

Variable	Range
This unit shall/may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>the installation and maintenance of the temporary and permanent traction bonds and bonding cables according to work plans</li> </ul>
Installation includes but is not limited to:	<ul style="list-style-type: none"> <li>fitting, setting up and putting in place structures,</li> <li>conductors, bonding cables,</li> <li>equipment,</li> <li>spark gaps and connecting terminals and</li> <li>conducting tests for operational soundness</li> </ul>
Maintenance	<p>May include:</p> <ul style="list-style-type: none"> <li>the removal, repair and replacement of bonds and bonding cables, conductors and associated hardware</li> </ul>

Maintenance includes	<ul style="list-style-type: none"> <li>the carrying out of diagnostics and tests on: <ul style="list-style-type: none"> <li>structures,</li> <li>conductors,</li> <li>equipment,</li> <li>spark gaps,</li> <li>systems as well as</li> <li>the removal, repair and replacement of bonding</li> <li>cables, spark gaps, conductors, and associated hardware and returning such to operational service</li> </ul> </li> </ul>
Earthen and bonding systems may be:	<ul style="list-style-type: none"> <li>permanent or temporary</li> </ul>
Types of conductors	<p>May include:</p> <ul style="list-style-type: none"> <li>steel, steel rail, copper, aluminum and steel, bare and</li> <li>sheathed cables, single core, stranded and flexible</li> </ul>
Cables	<p>May be:</p> <ul style="list-style-type: none"> <li>surfaced mounted, buried and enclosed</li> </ul>
Permanent jointing and terminating materials include:	<ul style="list-style-type: none"> <li>polymeric tape materials, polymeric heat shrink and covering materials,</li> <li>exothermic welds,</li> <li>crimped and bolted connections</li> </ul>
Temporary terminating components include:	<ul style="list-style-type: none"> <li>screwed and clipped earth/rail/conductor clamps</li> </ul>
The following constants and variables included are:	<ul style="list-style-type: none"> <li>Appropriate and relevant persons (see Personnel)</li> <li>Appropriate authorities</li> <li>Appropriate work platform</li> <li>Assessing risk</li> <li>Assessment</li> <li>Authorization</li> <li>Confined space</li> <li>Diagnostic, testing and restoration</li> <li>Documenting detail work events, record keeping and or storage of information</li> <li>Drawings and specifications</li> <li>Emergency</li> <li>Environmental and sustainable energy procedures</li> <li>Environmental legislation</li> <li>Environmental management documentation</li> <li>Established procedures</li> <li>Fall prevention</li> <li>Hazards</li> <li>Identifying hazards</li> <li>Inspect</li> </ul>

	<ul style="list-style-type: none"> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• maintaining traction bonds</li> <li>• installing traction bonds</li> <li>• Traction bonding</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• maintaining traction bonds</li> <li>• installing traction bonds</li> <li>• Traction bonding</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>



<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III</b>	
<b>Unit Title</b>	<b>Install and Maintain Overhead Distribution Network Infrastructure</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI3 20 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the installation and maintenance of poles and/or structures and associated hardware, other than towers, which may consist of wood, steel, concrete or composite type material. It includes installation and maintenance of overhead conductors and cables used on poles and structures (excluding towers) which includes the stringing, tensioning and terminating of the conductor/cable, as well as the cleaning of insulators (de-energized), the securing of the conductor to the insulators or supports and the undertaking of the electrical connections. It also covers maintenance work associated with the diagnosing of faults, the conducting of visual inspections, the confirmation of phasing and the completion of other enterprise tests. It also encompasses the isolation of systems and circuits, the fixing and or securing of hardware associated as well as the repair and or replacement of poles and or structures used in the distribution and or rail traction industry sectors. It encompasses the implementation of a suitable traffic management plan.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare/plan for the installation and maintenance of overhead network infrastructure	<p>3.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection.</p> <p>3.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>3.3 OHS policies and procedures related to requirements and established procedures the installation and maintenance of poles and/or structures, overhead conductors and cables and associated hardware are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>3.4 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>3.5 Hazards are identified; OHS risks assessed and control measures are prioritized, implemented and monitored including emergency exits kept clear according to established procedures.</p> <p>3.6 Resources including personnel, equipment, tools and</p>

	<p>personal protective equipment required for the job are obtained and confirmed in working order.</p> <p>3.7 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.</p> <p>3.8 Relevant personnel at worksite are confirmed current in First Aid, Pole Top Rescue and other related work procedures according to requirements.</p> <p>3.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p> <p>3.10 Site is prepared according to the work schedule and to minimize risk and damage to property, commerce, and individuals in accordance with established procedures.</p> <p>3.11 Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.</p> <p>3.12 Traffic management plan is identified and implemented.</p>		
<p>2. Carry out installation and maintenance of overhead network infrastructure</p>	<p>2.1 OHS, sustainable energy and Environmental principles and practices to reduce the incidents of accidents and minimize waste are monitored and followed in accordance with requirements and/or established procedures.</p> <p>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.</p> <p>2.3 Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.</p> <p>2.4 Confirm systems and circuits are isolated as required, proved safe to work on in accordance with the requirements/permits and established procedures.</p> <p>2.5 Apply essential knowledge and associated skills in the safe installation of poles and/or structures, overhead conductors and cables and their associated hardware to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.6 Poles and/or structures and their associated hardware to be installed are stabilized according to requirements.</p> <p>2.7 Overhead conductor/cables are strung, tensioned and terminated as per requirements/established procedures.</p>		
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	<p>2.8 Insulators are cleaned and conductors and anti-vibration devices, spaces/spreaders are secured as per established procedures.</p> <p>2.9 Electrical connections are made in accordance with the requirements/established procedures.</p> <p>2.10 <b>Installation</b> is carried out, in accordance with the work schedule and requirements/established procedures.</p> <p>2.11 <b>Maintenance</b>, including repair and/or replacement of poles and/or structures, and <b>overhead conductors</b> and cables is carried out, in accordance with the work schedule and requirements/established procedures.</p> <p>2.12 Unplanned events in the installation of <b>poles</b> and/or structures, overhead conductors and cables and associated hardware are undertaken within the scope of established procedures.</p> <p>2.13 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.</p> <p>2.14 On-going checks of quality of the work are undertaken in accordance with instructions and established procedures.</p>
<p>3. Complete the installation and maintenance of Overhead network infrastructure</p>	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.</p> <p>3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.</p> <p>3.3 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.</p> <p>3.4 Tools, <b>equipment</b> and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage or disposed of in accordance with established procedures.</p> <p>3.5 Relevant work permit(s) are signed off and, poles and/or structures, <b>overhead conductors and cables and their associated hardware</b> are returned to service in accordance with requirements.</p> <p>3.6 Conductors/cables are tested and commissioned in accordance with enterprise requirements and procedures.</p> <p>3.7 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified.</p>

Variable	Range
This unit may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>• the installation of poles and or structures and overhead conductors and cables used on poles and structures</li> </ul>
Equipment may include:	<ul style="list-style-type: none"> <li>• Pole types and structures may include:               <ul style="list-style-type: none"> <li>• wood,</li> <li>• concrete,</li> <li>• steel and composite</li> </ul> </li> <li>• Maintenance of poles and or structures may include:               <ul style="list-style-type: none"> <li>• the basic inspection,</li> <li>• removal,</li> <li>• repair and replacement of poles including welding, pole staking and rebutting</li> </ul> </li> </ul>
Structures include	<ul style="list-style-type: none"> <li>• poles and columns</li> </ul>
Associated hardware includes:	<ul style="list-style-type: none"> <li>• insulators,</li> <li>• cross arms,</li> <li>• stays,</li> <li>• earth down leads and bond wires,</li> <li>• cross arm braces,</li> <li>• pole steps,</li> <li>• shackle straps and associated bolts and clamps,</li> <li>• cantilever assembly,</li> <li>• pull off,</li> <li>• head span,</li> <li>• portal,</li> <li>• drop tube</li> </ul>
Pole stabilization techniques include:	<ul style="list-style-type: none"> <li>• back-fill consolidation,</li> <li>• concreting,</li> <li>• baulking,</li> <li>• reinforcement nailing,</li> <li>• approved steel reinforcing and</li> <li>• temporary and permanent stay-wires</li> </ul>
Methods of erection	<p>May include:</p> <ul style="list-style-type: none"> <li>• crane,</li> <li>• auger/erector,</li> <li>• winch/'A' frame,</li> <li>• lifting apparatus and</li> <li>• helicopter lift</li> </ul>
Installation and Maintenance of overhead conductors and cables	<p>May include:</p> <ul style="list-style-type: none"> <li>• the stringing, tensioning, terminating of the conductor/cable and</li> <li>• The removal, repair and replacement of cables, conductors and associated hardware and includes the cleaning of insulators. May include pre-energized/energisation checks and tests</li> <li>• Visual inspections, diagnosing maintenance work associated with:</li> </ul>

	<ul style="list-style-type: none"> <li>• the fault diagnosis,</li> <li>• conducting of visual inspections,</li> <li>• confirmation of phasing, and</li> <li>• The completion of other enterprise tests is also included. It also encompasses: <ul style="list-style-type: none"> <li>• the isolation of systems and circuits,</li> <li>• the procedure of issuing/accepting electrical access permits and</li> <li>• the updating of system data/maintenance records according to requirements and established procedures</li> </ul> </li> </ul>		
Types of conductor include:	<ul style="list-style-type: none"> <li>• copper</li> <li>• aluminum</li> <li>• steel</li> <li>• aluminum conductor steel reinforced (ACSR)</li> <li>• low voltage aerial bundled cable (LVABC)</li> <li>• Medium voltage aerial bundled cable (MVABC)</li> <li>• insulated unscreened cable (IUC)</li> <li>• service cable and fiber optic, pilot and control cables</li> </ul>		
Overhead systems include:	<ul style="list-style-type: none"> <li>• their associated earthen systems, e.g. MEN and CMEN LV systems,</li> <li>• bridging/bonding and conventional and SWER MV systems</li> </ul>		
Plant may include:	<ul style="list-style-type: none"> <li>• elevating work platform,</li> <li>• winches and capstans,</li> <li>• specialist tension stringing equipment,</li> <li>• cable trailers and</li> <li>• cable drum stands</li> </ul>		
Testing and recording equipment (LV) includes:	<ul style="list-style-type: none"> <li>• voltage detectors,</li> <li>• tong ammeters,</li> <li>• polarity testers,</li> <li>• insulation resistance testers,</li> <li>• recording meters and phase sequence indicators</li> </ul>		
Testing and recording equipment (MV) includes:	<ul style="list-style-type: none"> <li>• phasing sticks,</li> <li>• fault indicators,</li> <li>• radio frequency interference detectors and voltage detectors</li> </ul>		
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> </ul>		
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	<ul style="list-style-type: none"> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Alternating current circuit principles</li> <li>• Electromagnetic principles</li> <li>• Engineering applications of mathematical principles</li> <li>• Engineering applications of mechanical principles</li> <li>• Engineering applications of material properties.</li> <li>• Basic rigging techniques</li> <li>• Stores procedures</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Alternating current circuit</li> <li>• Generation power systems</li> <li>• Transmission, distribution and rail power systems</li> <li>• Substations, power transformers and reactors</li> <li>• Power line distribution installation</li> <li>• Power line installation safety</li> <li>• Pole and hardware installation</li> <li>• Low voltage electrical service installation</li> </ul>

	<ul style="list-style-type: none"> <li>• Power line safety practices</li> </ul>
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: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the workplace or in a simulated workplace setting.

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III</b>	
<b>Unit Title</b>	<b>Install Overhead Traction Configurations</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI3 21 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the installation of overhead traction configurations, which include overlaps, cross over, turnouts, crossings and/or train/tram crossing. It includes the undertaking of safe working practices on or about the running line/track. It also encompasses; the isolation of systems and circuits for safe working according to work plans, the correct positioning of road signs, barriers and/or warning devices and the procedure for issuing/accepting electrical permits. It also includes the visual inspection and necessary checks to confirm that equipment and associated hardware have been correctly installed according to design and are in a safe condition to test prior to putting into service, as well as the undertaking of pre-commissioning tests and the updating of installation data and relevant quality assurance documentation.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare for the installation of overhead traction configurations	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the installation of overhead traction configurations are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>1.4 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>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.</p> <p>1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.</p> <p>1.7 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.</p>



	<p>1.8 Relevant personnel at worksite are confirmed current in CPR, first aid, and other rescue procedures according to requirements.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p> <p>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.</p> <p>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.</p> <p>1.12 Rail/road signs, barriers and warning devices are positioned in accordance with requirements environmental constraints applicable to work are identified and control measures applied.</p> <p>1.13 Environmental constraints applicable to work are identified as control measures applied.</p>
<p>2. Carry out the installation of overhead traction configurations</p>	<p>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.</p> <p>2.2 Lifting, climbing, working and aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.</p> <p>2.3 System Installation and circuits are isolated as required, proved safe to work on in accordance with the requirements/permits and established procedures.</p> <p>2.4 Apply essential knowledge and associated skills in the safe installation of overhead traction configurations to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.5 Electrical equipment and associated hardware is positioned, secured and terminated/connected in accordance with requirements.</p> <p>2.6 <b>Overhead traction configurations</b> are installed as per requirements and established procedures.</p> <p>2.7 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.</p>

	<p>2.8 Unplanned events during the <b>installation</b> of overhead traction configurations are undertaken within the scope of established procedures.</p> <p>2.9 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.</p> <p>2.10 On-going checks of quality of the work are undertaken in accordance with instructions and established procedures.</p>
3. Complete the installation of overhead traction configurations	<p>3.1 Work undertaken is checked and tested against design drawings and works schedule for conformance with requirements and anomalies reported in accordance with established procedures.</p> <p>3.2 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.</p> <p>3.3 Tools, <b>equipment</b> and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.4 Relevant work <b>permit(s)</b> are signed off after final inspections and the system is energized, tested and returned to service in accordance with requirements.</p> <p>3.5 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified.</p>

Variable	Range
Overhead traction systems include:	<ul style="list-style-type: none"> <li>• their associated earthen systems</li> <li>• Plant may include elevating work platforms, road rail traction height access equipment or ladder.</li> </ul>
Installation includes but is not limited to:	<ul style="list-style-type: none"> <li>• fitting,</li> <li>• setting up,</li> <li>• putting in place structures,</li> <li>• conductors,</li> <li>• equipment,</li> <li>• systems and</li> <li>• conducting tests for operational soundness</li> </ul>
Types of track configurations	<p>may include:</p> <ul style="list-style-type: none"> <li>• overlaps,</li> <li>• cross-over,</li> <li>• turnouts,</li> <li>• 15-90 degree crossings,</li> <li>• diamond crossings,</li> <li>• Insulated crossings,</li> <li>• train/tram crossing and</li> <li>• tram frogs</li> </ul>

Testing and recording equipment (LV) include:	<ul style="list-style-type: none"> <li>• voltage detectors,</li> <li>• volt meters and insulation resistance testers</li> </ul>
Testing and recording equipment (MV) includes:	<ul style="list-style-type: none"> <li>• voltage detectors and field intensity testers</li> </ul>
Permits may include:	<ul style="list-style-type: none"> <li>• access permits,</li> <li>• permits to work and</li> <li>• other relevant permits and documents by recognized bodies</li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>

<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement occupational health and safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, policies and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• installing overhead traction configurations</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Electrical traction configurations</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III	
Unit Title	Maintain Overhead Traction Configurations
Unit Code	<a href="#">EIS DNI3 22 0612</a>
Unit Descriptor	This unit covers the maintenance and repair of overhead traction configurations, which include overlaps, cross-over, turnouts, crossings and/or train/tram crossing. It includes the repair and/or replacement of “like for like” electrical equipment and associated hardware according to requirements and the undertaking of safe working practices on or about the running line/track, including the correct positioning of road signs, barriers and/or warning devices and the procedure for issuing/accepting electrical permits. It also encompasses the isolation of systems and circuits for safe working according to work plans and the visual inspection and necessary checks to confirm that equipment and associated hardware are in a safe condition to test and/or return to service as well as the undertaking of re-commissioning tests to ensure the integrity of the traction system prior to a return to service and the updating of system data and/or maintenance records.

Elements	Performance Criteria
1. Prepare to maintain overhead traction configurations	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the <b><i>maintenance of overhead traction configurations</i></b> are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>1.4 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>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.</p> <p>1.6 Relevant work <b><i>permits</i></b> are obtained to access and perform work according to requirements and/or established procedures.</p> <p>1.7 Resources including personnel, equipment, tools and</p>

	<p>personal protective equipment required for the job are obtained and confirmed in working order.</p> <p>1.8 Relevant personnel at worksite are confirmed current in CPR, first aid, and other rescue procedures according to requirements.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p> <p>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.</p> <p>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.</p> <p>1.12 Rail/road signs, barriers and warning devices are positioned in accordance with requirements.</p> <p>1.13 Environmental constraints applicable to work are identified and control measures applied.</p>		
<p>2. Carry out the maintenance of overhead traction configurations</p>	<p>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.</p> <p>2.2 Lifting, climbing, working and aloft, and use of power tools/<b>equipment</b>, techniques and practices are safely followed and, currency according to requirements confirmed.</p> <p>2.3 System Installation and circuits are isolated as required, proved safe to work on in accordance with the requirements/permits and established procedures.</p> <p>2.4 Apply essential knowledge and associated skills in the safe maintenance of overhead traction configurations to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.5 Electrical equipment and associated hardware is tested in accordance with requirements and established procedures.</p> <p>2.6 Maintenance, including repair and/or replacement of overhead traction configurations is carried out, in accordance with the work schedule and requirements/established procedures.</p> <p>2.7 Hazard warnings and safety signs are recognized and hazards and assessed OHS risks are reported to the immediate authorized persons for directions according to</p>		
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	<p>established procedures.</p> <p>2.8 Unplanned events during the maintenance of overhead traction configurations are undertaken within the scope of established procedures.</p> <p>2.9 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.</p> <p>2.10 On-going checks of quality of the work are undertaken in accordance with instructions and established procedures.</p>
3. Complete the maintenance of overhead traction configurations	<p>3.1 Work undertaken is checked and tested against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.</p> <p>3.2 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.</p> <p>3.3 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.4 Relevant work permit(s) are signed off after final inspections and re commissioning checks. The system is energized, tested and returned to service in accordance with requirements.</p> <p>3.5 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified.</p>

Variable	Range
This unit shall/may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>the maintenance and pre-commissioning tests of overhead traction configurations according to work plans, encompassing the isolation of systems and circuits for safe working</li> </ul>
Maintenance includes:	<ul style="list-style-type: none"> <li>the carrying out of diagnostics and tests on structures, conductors, equipment, systems as well as the removal, repair and replacement of cables, conductors, and associated hardware and returning such to operational service. It includes the repair and/or replacement of "like for like" electrical equipment and associated hardware</li> </ul>
Types of track configurations that relate to:	<ul style="list-style-type: none"> <li>overhead wiring and may include: <ul style="list-style-type: none"> <li>overlaps,</li> <li>cross-over,</li> <li>turnouts,</li> <li>15 - 90 degree crossings,</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• diamond crossings,</li> <li>• insulated crossings,</li> <li>• train/tram crossing, and</li> <li>• tram frogs</li> </ul>
Overhead traction systems include:	<ul style="list-style-type: none"> <li>• their associated earthen systems</li> <li>• Plant may include: <ul style="list-style-type: none"> <li>• elevating work platforms,</li> <li>• road rail traction height access equipment or ladder</li> </ul> </li> </ul>
Testing and recording equipment (LV) include voltage:	<ul style="list-style-type: none"> <li>• detectors,</li> <li>• volt meters and</li> <li>• insulation resistance testers</li> </ul>
Testing and recording equipment (MV) includes:	<ul style="list-style-type: none"> <li>• voltage detectors and field intensity testers</li> </ul>
Permits may include:	<ul style="list-style-type: none"> <li>• access permits,</li> <li>• permits to work and other relevant permits and documents by recognized bodies</li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices</li> </ul>



	<ul style="list-style-type: none"> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• maintaining overhead traction configurations</li> <li>• Electrical traction configurations</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• maintaining overhead traction configurations</li> <li>• Electrical traction configurations</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III	
Unit Title	Install Overhead Traction Equipment and Components
Unit Code	<a href="#">EIS DNI3 23 0612</a>
Unit Descriptor	This unit covers the installation of the overhead traction electrical equipment and components as well as associated hardware including ancillary equipment. It includes the undertaking of safe working practices on or about the running line/track. It also encompasses the isolation of systems and circuits for safe working according to work plans and the correct positioning of road signs, barriers and or warning devices and the procedure of issuing/accepting electrical permits. It also includes the visual inspection and necessary checks to confirm that equipment, components and associated hardware have been correctly installed according to design and are in a safe condition to test prior to putting to service, the undertaking of pre-commissioning tests as required to ensure the integrity of the traction system prior to putting back into service and the updating of installation data and relevant quality assurance documentation.

Elements	Performance Criteria
1. Prepare for the installation of overhead traction equipment/ components	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the <b>installation of overhead traction</b></p> <p>1.4 <b>Equipment</b>/components are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>1.5 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>1.6 Hazards are identified; OHS risks assessed and control measures are prioritized, implemented and monitored including emergency exits kept clear according to established procedures.</p> <p>1.7 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.</p>

	<p>1.8 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.</p> <p>1.9 Relevant personnel at worksite are confirmed current in CPR, First Aid, and other rescue procedures according to requirements.</p> <p>1.10 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p> <p>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</p> <p>1.12 Rail/road signs, barriers and warning devices are positioned in accordance with requirements.</p> <p>1.13 Environmental constraints applicable to work are identified and control measures applied.</p>
<p>2. Carry out the installation of overhead Traction equipment/components</p>	<p>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.</p> <p>2.2 Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.</p> <p>2.3 System Installation and circuits are isolated as required, proved safe to work on in accordance with the requirements/permits and established procedures.</p> <p>2.4 Apply essential knowledge and associated skills in the safe installation of overhead traction equipment/components to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.5 Electrical components/equipment and associated hardware are positioned, secured and terminated/connected in accordance with requirements and established procedures.</p> <p>2.6 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.</p> <p>2.7 Unplanned events during the installation of overhead traction equipment/components are undertaken within the scope of established procedures.</p> <p>2.8 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.</p>

	2.9 On-going checks of quality of the work are undertaken in accordance with instructions and established procedures.
3. Complete the installation of overhead traction equipment/components	<p>3.1 Work undertaken is checked against design drawings and works schedule for conformance with requirements and anomalies reported in accordance with established procedures.</p> <p>3.2 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.</p> <p>3.3 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.4 Relevant work permit(s) are signed off and, overhead traction equipment/components are commissioned in accordance with requirements.</p> <p>3.5 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified.</p>

Variable	Range
Installation includes but is not limited to:	<ul style="list-style-type: none"> <li>• fitting</li> <li>• setting up and putting in place conductors,</li> <li>• equipment</li> <li>• systems and conducting tests for operational soundness</li> </ul>
Types of traction wire support structures may consist of:	<ul style="list-style-type: none"> <li>• portals</li> <li>• pull-off</li> <li>• drop-pieces</li> <li>• head spans</li> <li>• cross spans and</li> <li>• tramway support networks</li> </ul>
Types of traction components may include:	<ul style="list-style-type: none"> <li>• droppers</li> <li>• bay components</li> <li>• cantilever hardware</li> <li>• portal hardware</li> <li>• steady spans hardware</li> <li>• steady spans</li> <li>• insulators</li> <li>• pull-off</li> <li>• tension regulators</li> <li>• section insulators</li> <li>• neutral sections</li> <li>• tramway frogs</li> <li>• pendulums</li> <li>• crossing pans and ears/hangers</li> </ul>

	<ul style="list-style-type: none"> <li>• booster and auxiliary transformers</li> <li>• air break switches</li> <li>• in-span feeders</li> <li>• isolation switches knuckles (insulated and non-insulated),</li> <li>• cross arms</li> </ul>
Traction system components may consist of:	<ul style="list-style-type: none"> <li>• metalwork</li> <li>• wires</li> <li>• hardware</li> <li>• fittings and</li> <li>• insulators</li> </ul>
Types of conductor may include:	<ul style="list-style-type: none"> <li>• HD</li> <li>• CAD and tin bearing copper</li> <li>• aluminum</li> <li>• steel</li> <li>• aluminum conductor steel reinforced</li> <li>• copper cover steel</li> </ul>
Types of wiring arrangements include:	<ul style="list-style-type: none"> <li>• single wire/tram systems</li> <li>• simple and compound catenaries systems</li> <li>• Plant may include: <ul style="list-style-type: none"> <li>• ladders</li> <li>• elevating work platforms</li> <li>• winches</li> <li>• specialist tension string equipment</li> <li>• cable trailers</li> <li>• work trains</li> <li>• rail mounted overhead wiring equipment/vehicles and</li> <li>• road rail mounted overhead wiring equipment/vehicles</li> </ul> </li> </ul>
Ancillary equipment may include:	<ul style="list-style-type: none"> <li>• transformers</li> <li>• switches, and</li> <li>• surge diverters</li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> </ul>

	<ul style="list-style-type: none"> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Electrical traction principles</li> <li>• Electrical traction protection requirements</li> <li>• Overhead traction equipment and components</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Electrical traction practices</li> <li>• Electrical traction protection requirements</li> <li>• Overhead traction equipment and components</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration/ with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III</b>	
<b>Unit Title</b>	<b>Maintain Overhead Traction Equipment and Components</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI3 24 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the maintenance and repair of the overhead traction electrical equipment and components as well as associated hardware including ancillary equipment. It includes the repair or replacement of “like for like” electrical components/equipment and associated hardware and the undertaking of safe working practices on or about the running line/track. It also encompasses the isolation of systems and circuits for safe working according to work plans and the correct positioning of road signs, barriers and or warning devices and the procedure of issuing/accepting electrical permits. It also includes the visual inspection and necessary checks to confirm that equipment; components and associated hardware are in a safe condition to test and/or return to service, the re-commissioning tests of the electrical equipment, components and associated hardware and the updating of system data/maintenance records.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare to the maintenance of overhead traction equipment/ components	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the maintenance of overhead traction equipment/components are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>1.4 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>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.</p> <p>1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.</p> <p>1.7 Resources including personnel, equipment, tools and</p>

	<p>personal protective equipment required for the job are obtained and confirmed in working order.</p> <p>1.8 Relevant personnel at worksite are confirmed current in CPR, First Aid, and other rescue procedures according to requirements.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p> <p>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.</p> <p>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.</p> <p>1.12 Rail/road signs, barriers and warning devices are positioned in accordance with requirements.</p> <p>1.13 Environmental constraints applicable to work are identified and control measures are applied.</p>		
<p>2. Carry out the maintenance of overhead traction equipment/ components</p>	<p>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.</p> <p>2.2 Lifting, climbing, working aloft, and use of power tools/<i>equipment</i>, techniques and practices are safely followed and, currency according to requirements confirmed.</p> <p>2.3 System Installation and circuits are isolated as required, proved safe to work on in accordance with the requirements/permits and established procedures.</p> <p>2.4 Apply essential knowledge and associated skills in the safe maintenance of overhead traction equipment/ components to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.5 Electrical component/equipment and associated hardware is ascertained as operating within normal operating parameters and in accordance with requirements and established procedures.</p> <p>2.6 <b>Maintenance</b>, including repair and/or replacement of <b>overhead traction equipment</b>/components is carried out, in accordance with the work schedule and requirements/ established procedures.</p> <p>2.7 Hazard warnings and safety signs are recognized and hazards and assessed OHS risks are reported to the</p>		
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	<p>immediate authorized persons for directions according to established procedures.</p> <p>2.8 Unplanned events during the maintenance of overhead traction equipment/components are undertaken within the scope of established procedures.</p> <p>2.9 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.</p> <p>2.10 On-going checks/visual inspection of quality of the work are undertaken in accordance with instructions and established procedures.</p>
3. Complete the maintenance of overhead traction equipment/components	<p>3.1 Work undertaken is checked and or tested against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.</p> <p>3.2 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.</p> <p>3.3 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.4 Relevant work permit(s) are signed off after final inspections and the system is energized, tested and returned to service in accordance with requirements.</p> <p>3.5 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified.</p>

Variable	Range
Maintenance may include the carrying out of diagnostics and tests on:	<ul style="list-style-type: none"> <li>• conductors,</li> <li>• equipment,</li> <li>• systems as well as the removal, repair and replacement of cables, conductors, and associated hardware and returning such to operational service</li> </ul>
Types of traction wire support structures may consist of:	<ul style="list-style-type: none"> <li>• portals</li> <li>• pull-off</li> <li>• drop-pieces</li> <li>• head spans</li> <li>• cross spans and</li> <li>• tramway support networks</li> </ul>
Types of traction components may include:	<ul style="list-style-type: none"> <li>• droppers</li> <li>• bay components</li> <li>• cantilever hardware</li> <li>• portal hardware</li> <li>• steady spans hardware</li> </ul>

	<ul style="list-style-type: none"> <li>• steady spans</li> <li>• insulators</li> <li>• pull-off arms</li> <li>• tension regulators</li> <li>• section insulators</li> <li>• neutral sections</li> <li>• tramway frogs</li> <li>• pendulums</li> <li>• crossing pans</li> <li>• ears/hangers</li> <li>• booster and auxiliary transformers</li> <li>• air break switches</li> <li>• in-span feeders</li> <li>• isolation switches</li> <li>• knuckles (insulated and non-insulated) and</li> <li>• cross arms</li> </ul>
Traction system components may consist of:	<ul style="list-style-type: none"> <li>• metalwork</li> <li>• wires</li> <li>• hardware</li> <li>• fittings and</li> <li>• insulators</li> </ul>
Types of conductor may include:	<ul style="list-style-type: none"> <li>• HD</li> <li>• CAD, and tin bearing copper</li> <li>• aluminum</li> <li>• steel</li> <li>• aluminum conductor steel reinforced and</li> <li>• copper cover steel</li> </ul>
Types of wiring arrangements include:	<ul style="list-style-type: none"> <li>• single wire/tram systems,</li> <li>• simple and compound catenaries systems</li> <li>• Plant may include: <ul style="list-style-type: none"> <li>• ladders</li> <li>• elevating work platforms</li> <li>• winches</li> <li>• specialist tension string equipment,</li> <li>• cable trailers</li> <li>• work trains</li> <li>• rail mounted overhead wiring equipment/vehicles and</li> <li>• road rail mounted overhead wiring equipment/ vehicles</li> </ul> </li> </ul>
Ancillary equipment may include:	<ul style="list-style-type: none"> <li>• transformers</li> <li>• switches, and</li> <li>• surge diverters</li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> </ul>

	<ul style="list-style-type: none"> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards and Identifying hazards</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices and OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• maintaining overhead traction equipment and components</li> <li>• Electrical traction principles</li> <li>• Electrical traction protection requirements</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• maintaining overhead traction equipment and components</li> <li>• Electrical traction practices</li> <li>• Electrical traction protection requirements</li> <li>• Overhead traction equipment and components</li> <li>• safe working practices and applying OHS practices</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>

Methods of Assessment	Competence may be assessed through: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III	
Unit Title	Operate Road Rail Traction Height Access Equipment
Unit Code	<a href="#">EIS DNI3 25 0612</a>
Unit Descriptor	This unit covers the operation and use of road rail traction height access equipment to install and maintain the overhead traction systems. It includes the preoperational inspection, servicing of plant/equipment and the undertaking of safe working practices on or about the running line/track. It also encompasses the isolation of systems and circuits for safe working according to work plans and the correct positioning of road signs, barriers and/or warning devices.

Elements	Performance Criteria
1. Prepare to operate road rail traction height access equipment	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the operation of road rail traction height access equipment are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>1.4 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>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.</p> <p>1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.</p> <p>1.7 Resources including personnel, equipment, tools and personal protective <b>equipment</b> required for the job are obtained and confirmed in working order.</p> <p>1.8 Pre-operational inspection servicing of plant/equipment is carried out as per established procedures.</p> <p>1.9 Relevant personnel at worksite are confirmed current in CPR, First Aid, and other rescue procedures and other related work procedures according to requirements.</p>

	<p>1.10 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p> <p>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.</p> <p>1.12 Personnel participating in the work, including <b>plant</b> operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.</p> <p>1.13 Rail/road signs, barriers and warning devices are positioned in accordance with requirements.</p> <p>1.14 <b>Environmental</b> constraints applicable to work are identified and control measures applied.</p>		
<p>2. Carry out the operation of road rail traction height access equipment</p>	<p>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.</p> <p>2.2 Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.</p> <p>2.3 Apply essential knowledge and associated skills in the safe operation of road rail traction height access equipment to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.4 Road rail traction height access equipment is operated as per requirements and established procedures.</p> <p>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.</p> <p>2.6 Unplanned events during the operation of road rail traction height access equipment are undertaken within the scope of established procedures.</p> <p>2.7 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.</p> <p>2.8 On-going checks of quality of the work are undertaken in accordance with instructions and established procedures.</p>		
<p>3. Complete the operation of road rail traction height access</p>	<p>3.1 Post operational checking and servicing of plant and equipment is carried out for conformance with requirements/established procedures and anomalies reported in accordance with established procedures.</p> <p>3.2 Work site is rehabilitated, cleaned up and made safe in</p>		
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equipment	<p>accordance with established procedures.</p> <p>3.3 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.4 Relevant work permit(s) are signed off and, the road rail traction height access equipment is returned in accordance with established procedures.</p> <p>3.5 Works completion records and reports, are processed and appropriate personnel notified.</p>
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Variable	Range
Plant may include:	<ul style="list-style-type: none"> <li>• elevating work platforms,</li> <li>• winches,</li> <li>• specialist tension string equipment,</li> <li>• cable trailers,</li> <li>• Rail and road mounted overhead vehicles and vehicle mounted cranes. Excluding rail bound overhead wiring consist</li> </ul>
Equipment operation includes:	<ul style="list-style-type: none"> <li>• the horizontal and vertical operation of the work platform,</li> <li>• pre-operational checks, obtaining appropriate relevant track or road authorities,</li> <li>• observing relevant statutory electrical and mechanical clearances, and</li> <li>• communication protocol between relevant personnel</li> </ul>
Operating environment may include:	<ul style="list-style-type: none"> <li>• off-track,</li> <li>• on-track in the vicinity of live and dead traction and distribution equipment,</li> <li>• live line working and within an operational road,</li> <li>• rail or tram traffic environment</li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> </ul>

	<ul style="list-style-type: none"> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• operating road rail traction height access equipment</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• safe working practices and applying OHS practices</li> <li>• Road rail traction height access equipment</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>



Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III	
Unit Title	Perform Rail Traction Switching Operations to a Given Schedule
Unit Code	<a href="#">EIS DNI3 26 0612</a>
Unit Descriptor	This unit covers the operation of circuit breaking and isolation devices associated with energy reticulation systems/networks, which apply to rail systems in field situations according to established procedures. It also encompasses the procedure of; communicating with the Switching Control Officer or Electrical Control Officer, isolating the electrical equipment and the line or work site, as well as proving that the area is de-energized and earthed or rail-connected, the issuing/accepting or holding of electrical permits and the returning of the affected circuits to service.

Elements	Performance Criteria
1. Prepare for rail traction switching operations to a given schedule	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for rail traction switching operations to a given schedule are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>1.4 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>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.</p> <p>1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures. Resources including personnel, <b>equipment</b>, tools and personal protective equipment required for the job are obtained and confirmed in working order.</p> <p>1.7 Relevant personnel at worksite are confirmed current in CPR, first aid, and other rescue procedures and related work procedures according to requirements.</p>

	<p>1.8 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p> <p>1.9 Modifications to the scheduled which may be required after assessing the worksite is communicated to appropriate personnel for formal approval.</p> <p>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. Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.</p> <p>1.11 Safe working, road signs, barriers and warning devices are in place in accordance with requirements.</p>
<p>2. Carry out rail traction switching operations to a given schedule</p>	<p>2.1 OHS principles and practices to reduce incidents and accidents are followed in accordance with requirements and/or established procedures.</p> <p>2.2 Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.</p> <p>2.3 Essential knowledge and associated skills are applied in the safe switching of rail traction operations to ensure completion in an agreed timeframe and, to quality standards.</p> <p>2.4 Communications with Switching Control Officer are established and maintained throughout the isolation operation according to established procedures.</p> <p>2.5 Electrical equipment and associated circuits line/network or work site to be switched is isolated and proved de-energized using appropriate devices and earthed or rail connected where required according to requirements and established procedures.</p> <p>2.6 Rail traction switching to a schedule is carried out, in accordance with requirements/established procedures.</p> <p>2.7 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.</p> <p>2.8 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.</p> <p>2.9 On-going checks of quality of the work are undertaken in accordance with instructions and established</p>

	procedures.
3. Complete the rail traction switching operations to a given schedule	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.</p> <p>3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.</p> <p>3.3 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.</p> <p>3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.5 Relevant work permit(s) are signed off, safety devices are removed, and the system is made ready to be re-energized and returned to service in accordance with requirements/established procedures.</p> <p>3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel and authority notified.</p>

Variable	Range
This unit may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>the switching of circuit breaking and isolation devices associated with energy reticulation systems/networks, which applies to rail systems in field situations</li> </ul>
Equipment may include:	<ul style="list-style-type: none"> <li>circuit breakers,</li> <li>isolators,</li> <li>links,</li> <li>fuses,</li> <li>field switches,</li> <li>air-break switches,</li> <li>gas switches,</li> <li>Low Voltage switches,</li> <li>combined rail isolating switches,</li> <li>siding switches,</li> <li>earthen/ rail connect equipment,</li> <li>test equipment,</li> <li>Medium voltage gloves,</li> <li>Medium voltage mats,</li> <li>operating rods/sticks,</li> <li>aerial switches and motor driven switches,</li> <li>voltage detectors</li> </ul>
Constants and variables included in this unit:	<ul style="list-style-type: none"> <li>Appropriate and relevant persons (see Personnel)</li> <li>Appropriate authorities</li> <li>Appropriate work platform</li> </ul>

	<ul style="list-style-type: none"> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• performing rail traction switching operations to a given schedule</li> <li>• Power line distribution installation</li> <li>• Power line installation safety</li> <li>• Switchgear installation</li> <li>• Low voltage switching principles</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• performing rail traction switching operations to a given schedule</li> </ul>

	<ul style="list-style-type: none"> <li>• Power line distribution installation</li> <li>• Power line installation safety</li> <li>• Switchgear installation</li> <li>• Low voltage switching practices</li> </ul>
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: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III</b>	
<b>Unit Title</b>	<b>Install and Maintain Network Infrastructure LV &amp; MV Underground Cables</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI3 27 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the installation and maintenance of de-energized low and medium voltage underground cables and covers the laying of cables as well as the jointing, terminating, repair and replacement of cables. It could include direct laying of cables in trenches, on racks, in troughs and/or in conduit or ducts and also includes the isolation of systems and circuits, the procedure of issuing/accepting electrical access permits, the undertaking of pre-commissioning and/or re-commissioning tests and the updating of system data/maintenance records.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare for the laying, installation and maintenance of underground cables	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the laying, installing and maintenance of LV and MV underground cables are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>1.4 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>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.</p> <p>1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.</p> <p>1.7 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.</p> <p>1.8 Relevant personnel at work site are confirmed current in First Aid and other related work procedures according to requirements.</p> <p>1.9 Liaison and communication issues with other/authorized</p>

	<p>1.10 Personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p> <p>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.</p> <p>1.12 Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.</p> <p>1.13 Road signs, barriers and warning devices are positioned in accordance with requirements.</p>
<p>2. Carry out the laying, installation and maintenance of LV and MV underground cables</p>	<p>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.</p> <p>2.2 Lifting, climbing, working in confined spaces and working aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.</p> <p>2.3 System Installation and circuits are isolated as required, proved safe to work on in accordance with the requirements/permits and established procedures.</p> <p>2.4 Essential knowledge and associated skills are applied for the safe installation and maintenance of LV and MV underground cables to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.5 Electrical cables are laid in accordance with the work schedule and requirements/established procedures.</p> <p>2.6 De-energized LV and MV underground cables are installed according to the work schedule and requirements/established procedures.</p> <p>2.7 Maintenance, including repair and/or replacement of de-energized LV and MV underground cables is carried out, in accordance with the work schedule and requirements/established procedures.</p> <p>2.8 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.</p> <p>2.9 Unplanned events in the laying, installing and carrying out the maintenance of LV and MV underground cables are undertaken within the scope of established procedures.</p>

	<p>2.10 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.</p> <p>2.11 On-going checks of quality of the work are undertaken in accordance with instructions and established procedures.</p>
3. Complete the laying, installation and maintenance of LV and MV underground cables	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.</p> <p>3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.</p> <p>3.3 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.</p> <p>3.4 Tools, <b>equipment</b> and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.5 Relevant work permit(s) are signed off and LV and MV underground cables are returned to service in accordance with requirements</p> <p>3.6 Works completion <b>records</b>, reports, drawings and/or documentation and information are finalized and processed and appropriate personnel notified.</p>

Variable	Range
This unit shall/may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>the installation and maintenance of de-energized low and medium voltage underground polymeric cables and covers the laying, jointing, terminating, repair and replacement of cables used in systems and circuits and the issuing/accepting of relevant permits</li> <li>the laying of ducts and/or conduit for electrical cables</li> </ul>
The unit includes:	<ul style="list-style-type: none"> <li>the laying of cables direct in trenches, on racks, in troughs and /or in conduit or ducts</li> <li>cable pulling methods, pulling tensions, minimum bending radii, reduction of frictional forces, use of supporting plant (eg dynamometers, rigging, winches, etc), working on FRC, PVC, A/C ducted systems and the cutting and sealing of cables</li> </ul>
Test and recording equipment	<p>May include:</p> <ul style="list-style-type: none"> <li>voltage detectors, tong ammeters,</li> <li>cable identification equipment, and insulation resistance testers</li> </ul>
Jointing and terminating materials	<p>May include:</p> <ul style="list-style-type: none"> <li>compound and resin filled boxes,</li> <li>polymeric tape materials,</li> </ul>
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	<ul style="list-style-type: none"> <li>• polymeric heat shrink materials,</li> <li>• “slip-on” molded components and pre-stretched polymeric materials,</li> <li>• compression, welded and mechanical connectors</li> </ul>
<p>Jointing and terminating equipment and locations</p>	<p>May include:</p> <ul style="list-style-type: none"> <li>• links,</li> <li>• fuses,</li> <li>• disconnect boxes,</li> <li>• ring main units,</li> <li>• distribution fuse boxes,</li> <li>• pad mount and ground transformers,</li> <li>• chamber substations,</li> <li>• LV and MV switchboards,</li> <li>• pillars/turrets,</li> <li>• bus bar/termination boxes,</li> <li>• street lighting control points and</li> <li>• street lighting columns</li> </ul>
<p>The following constants and variables included in this unit:</p>	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Work clearance systems</li> </ul>

<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• laying, installing and maintaining LV and MV underground cables</li> <li>• Alternating current circuit principles</li> <li>• Magnetism</li> <li>• Electromagnetic principles</li> <li>• Stores procedures</li> <li>• Substations, power transformers and reactors fundamentals</li> <li>• Fundamentals of jointing LV and MV polymeric cables.</li> <li>• LV and MV polymeric cable jointing principles</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• safe working practices and applying OHS practices</li> <li>• laying, installing and maintaining LV and MV underground cables</li> <li>• Alternating current circuit practices</li> <li>• Electromagnetic practices</li> <li>• Transmission, distribution and rail power systems</li> <li>• Underground cable installation</li> <li>• LV and MV polymeric cable jointing practices</li> <li>• Underground cable construction</li> <li>• Power line safety practices</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III</b>	
<b>Unit Title</b>	<b>Inspect, Maintain and Restore Energized LV Overhead Distribution Network Infrastructure</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI3 28 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the inspection of overhead structures such as poles and/or other structures other than towers and the maintenance of overhead energized low voltage conductors and cables. It includes the conducting of low voltage switching operations involving the operation of circuit breaking and isolation devices from a given switching schedule and in accordance with enterprise procedures. It covers low voltage distribution systems in field situations but also includes paralleling in accordance with the switching schedule. It also includes inspection of electrical apparatus such as, overhead conductors and or cables, underground and overhead transition points, electrical equipment, such as pole-mounted transformers, switchgear, hardware and or earthen systems. It encompasses the completion of inspection reports and other relevant documentation in accordance with requirements.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare for the inspection, maintenance and restoration of overhead distribution network infrastructure	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the, inspection of overhead structures and electrical apparatus used on poles and/or structures, the maintenance of overhead energized LV conductors and cables and LV switching, are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>1.4 Physical loads and calculations are confirmed according to requirements, using essential knowledge and appropriate skill.</p> <p>1.5 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>1.6 Hazards are identified; OHS risks assessed and control measures are prioritized, implemented and monitored including emergency exits kept clear according to established procedures.</p>

	<p>1.7 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.</p> <p>1.8 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.</p> <p>1.9 Specialist equipment for live working is inspected and confined in working order as per requirements and established procedures.</p> <p>1.10 Relevant personnel at worksite are confirmed current in First Aid, Pole Top Rescue and other related work procedures according to requirements.</p> <p>1.11 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p> <p>1.12 Site is prepared according to the work schedule and to minimize risk and damage to property, commerce, and individuals in accordance with established procedures.</p> <p>1.13 Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.</p> <p>1.14 Traffic management plan is identified and implemented.</p>		
<p>2. Carry out inspection, maintenance and restoration of overhead distribution network infrastructure</p>	<p>2.1 OHS, sustainable energy and environmental principles and practices to reduce the incidents of accidents and minimize waste are monitored and followed in accordance with requirements and/or established procedures.</p> <p>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.</p> <p>2.3 Essential knowledge and associated skills are applied in the safe maintenance and restoration of overhead distribution network infrastructure to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.4 Inspection of overhead structures and electrical apparatus used on poles and/or structures is carried out, in accordance with the work schedule and requirements/established procedures.</p> <p>2.5 Maintenance, including repair and/or replacement of poles and/or structures is carried out, in accordance with the work schedule and requirements/established procedures.</p>		
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	<p>2.6 Communications with Switching Control Officer are established and maintained throughout the isolation operation according to established procedures.</p> <p>2.7 Electrical equipment and associated circuits line/network or work site to be switched including paralleling is isolated and proved de-energized using appropriate devices and earthed where required according to requirements and established procedures.</p> <p>2.8 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.</p> <p>2.9 Unplanned events during the inspection, maintenance or switching procedures are undertaken within the scope of established procedures.</p> <p>2.10 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.</p> <p>2.11 On-going checks of quality of the work are undertaken in accordance with instructions and established procedures.</p>
<p>3. Complete the inspection, maintenance and restoration of overhead distribution network infrastructure</p>	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.</p> <p>3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.</p> <p>3.3 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.</p> <p>3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage or disposed of in accordance with established procedures.</p> <p>3.5 Relevant work permit(s) are signed off and, overhead structures and electrical apparatus used on poles and/or structures are returned to service in accordance with requirements.</p> <p>3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified.</p>

<b>Variable</b>	<b>Range</b>
This unit may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>the inspection,</li> <li>maintenance and</li> <li>restoration of overhead distribution network infrastructure</li> </ul>
Inspection may be carried out	<ul style="list-style-type: none"> <li>on foot, and/or</li> <li>by conventional ground-based vehicle, or from the air</li> <li>Aircraft may be helicopters or fixed-wing types.</li> </ul>
Inspection techniques include:	<ul style="list-style-type: none"> <li>use of X-ray and infrared camera</li> </ul>
Items to be inspected	<ul style="list-style-type: none"> <li>May include:</li> <li>overhead poles and or</li> <li>structures, but not towers</li> </ul>
Types of electrical apparatus to be inspected include:	<ul style="list-style-type: none"> <li>overhead conductors and cables,</li> <li>overhead transition points and,</li> <li>electrical equipment such as pole-mounted transformers and air-break switches,</li> <li>hardware, such as insulators, surge arrestors and cross-arms and or earthen systems</li> </ul>
The maintenance of overhead energized low voltage conductors and cables must take into account:	<ul style="list-style-type: none"> <li>the potential hazards,</li> <li>the calculation of physical loads, including an understanding of the effects of traffic loads and de-rating of circuits</li> </ul>
Maintenance may include:	<ul style="list-style-type: none"> <li>the removal, repair and replacement of cables, conductors and associated hardware</li> </ul>
Structures include:	<ul style="list-style-type: none"> <li>poles, and columns</li> </ul>
Work methods require:	<ul style="list-style-type: none"> <li>the use of insulating gloves and specialized live working equipment and tools</li> </ul>
Work may be performed:	<ul style="list-style-type: none"> <li>from elevating work platform, ladder, portable pole platform, or the ground</li> </ul>
Testing and recording devices include:	<ul style="list-style-type: none"> <li>voltage detectors</li> <li>tong ammeters</li> <li>polarity testers</li> <li>recording meters and phase sequence indicators</li> </ul>
Specialized live working equipment includes:	<ul style="list-style-type: none"> <li>insulating mats and sleeves,</li> <li>insulating gloves,</li> <li>temporary bridges/hoppers,</li> <li>insulated cable tensioning devices and</li> <li>ladder/pole shrouds and</li> <li>equipment potential bonding</li> </ul>
Low voltage switching operation	<ul style="list-style-type: none"> <li>May involve:</li> <li>the operation of circuit breaking and isolation devices from a given switching schedule as it relates to low voltage</li> </ul>

	distribution systems in field situations but also includes paralleling with the switching schedule
Operating circuit isolation devices associated with energy reticulation systems/networks is confined to:	<ul style="list-style-type: none"> <li>• low voltage systems in field situations which performed in accordance with a switching schedule and established procedures</li> </ul>
Switchgear may include:	<ul style="list-style-type: none"> <li>• Low Voltage fuses,</li> <li>• Low Voltage links and</li> <li>• bridges</li> </ul>
Specialist tools and devices	<p>May include:</p> <ul style="list-style-type: none"> <li>• Low Voltage detectors,</li> <li>• Low Voltage polarity testers Low Voltage phase rotation indicators</li> </ul>
Switching programs/ schedule refers to:	<ul style="list-style-type: none"> <li>• structure,</li> <li>• switch or equipment number,</li> <li>• locations,</li> <li>• Low Voltage distributor,</li> <li>• spur or feeder,</li> <li>• outage times,</li> <li>• work order/plan</li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation and MSDS</li> <li>• Notification</li> <li>• OHS practices and OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Work clearance systems</li> </ul>

<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, policies and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• inspecting, maintenance and restoration of overhead distribution network infrastructure</li> <li>• Poles and structures inspection principles</li> <li>• Power line inspection principles</li> <li>• Low voltage – energized working practices for substations</li> <li>• Power line safety practices</li> <li>• Switching installation</li> <li>• Low voltage switching principles</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• safe working practices and applying OHS practices</li> <li>• inspecting, maintenance and restoration of overhead distribution network infrastructure</li> <li>• Poles and structures inspection practices</li> <li>• Power line inspection practices</li> <li>• Low voltage – energized working practices for substations</li> <li>• Power line safety practices</li> <li>• Switching installation</li> <li>• Low voltage switching practices</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>



<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III</b>	
<b>Unit Title</b>	<b>Install and Maintain Network Infrastructure Electrical Equipment</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI3 29 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the installation and maintenance of electrical equipment, such as fuse switches, drops out switches, sectionalizers, links, surge arrestors, gas filled and or oil filled switches, which are relevant to the transmission, distribution and rail networks. It includes the termination/ connection of the equipment in accordance to enterprise requirements; the repair and/or replacement of “like for like” electrical equipment and associated hardware, and may include sampling of insulating oils. It also encompasses the identification of faults, the relevant pre-commissioning tests involving the equipment/ system and the interpretation of these tests against agreed specifications. It excludes the energisation of the equipment maintained in a highly complex, interdependent and interconnected electricity supply Network system, where the effects of unintended consequences on the system are high risk and appropriate personnel effect energisation.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare for the installation and maintenance of network infrastructure electrical equipment	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the installation and or maintenance of network infrastructure electrical equipment are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>1.4 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>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.</p> <p>1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.</p>

	<p>1.7 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.</p> <p>1.8 Relevant personnel at worksite are confirmed current in First Aid, Pole Top Rescue and other related work procedures according to requirements.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p> <p>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.</p> <p>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.</p> <p>1.12 Road signs, barriers and warning devices are positioned in accordance with requirements.</p>		
<p>2. Carry out installation and maintenance of network infrastructure electrical equipment</p>	<p>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.</p> <p>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.</p> <p>2.3 Apply essential knowledge and associated skills in the safe installation of network infrastructure electrical equipment to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.4 Electrical equipment and associated hardware is positioned, secured and terminated/connected in accordance with requirements and established procedures.</p> <p>2.5 Maintenance, including repair and/or replacement of network infrastructure electrical equipment is carried out, in accordance with the work schedule and requirements/established procedures.</p> <p>2.6 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.</p> <p>2.7 Unplanned events in the installation of electrical equipment (network infrastructure) are undertaken within</p>		
<p>Page 145 of 316</p>	<p>Ministry of Education Copyright</p>	<p>Power Distribution Network Infrastructure/System Installation and Maintenance Ethiopian Occupational Standard</p>	<p>Version 1 June 2012</p>

	<p>the scope of established procedures.</p> <p>2.8 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.</p> <p>2.9 On-going checks of quality of the work are undertaken in accordance with instructions and established procedures.</p>
3. Complete the installation and maintenance of network infrastructure electrical equipment	<p>3.1 Work undertaken is checked/ tested against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.</p> <p>3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.</p> <p>3.3 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.</p> <p>3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.5 Relevant work permit(s) are signed off and, electrical equipment (network infrastructure) are returned to service in accordance with requirements.</p> <p>3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified.</p>

Variable	Range
This unit shall/may be demonstrated in relation to: the	<ul style="list-style-type: none"> <li>installation, termination/connection and maintenance of overhead electrical equipment relevant to the transmission, distribution and rail networks, and</li> <li>includes pre-commissioning</li> </ul>
Maintenance	<p>May include:</p> <ul style="list-style-type: none"> <li>the removal, repair and replacement of electrical equipment encompassing “like for like” and associated hardware as well as the termination and/or connection of this equipment according to requirements and may include sampling of insulating oils</li> <li>also encompass the identification of faults;</li> <li>The pre-commissioning tests involving the equipment/system and the interpretation of these tests against agreed specifications.</li> <li>excludes the energisation of the equipment maintained in a highly complex, interdependent and interconnected electricity supply Network system, where the effects of unintended consequences on the system are high risk and appropriate personnel effect energisation</li> </ul>

Electrical equipment and associated hardware	<p>May include:</p> <ul style="list-style-type: none"> <li>• relevant transmission or distribution line work/network</li> <li>• switchgear (e.g. re closers, sectionalizes, drop-out fuses, disconnections, isolators, air break switches, gas filled switches, links, fuses, fuse switches and circuit breakers)</li> <li>• transformers (e.g. pad mount, pole-mounted and mobile)</li> <li>• reactors</li> <li>• fault indicators</li> <li>• regulators</li> <li>• street lighting control points</li> <li>• capacitors</li> <li>• cables</li> <li>• underground/overhead cable terminations</li> <li>• relays (simple)</li> <li>• mobile generators and surge arrestors</li> <li>• support brackets and the like</li> </ul>
This unit does not include:	<ul style="list-style-type: none"> <li>• the energisation of equipment in a highly complex, interdependent and interconnected electricity supply</li> <li>• Network system, where the effects of unintended consequences on the system are high risk and appropriate personnel effect energisation</li> </ul>
Test and recording equipment includes:	<ul style="list-style-type: none"> <li>• voltage detectors</li> <li>• phasing equipment</li> <li>• tong ammeters</li> <li>• voltmeters</li> <li>• recording meters and insulation resistance testers used for the purposes as intended and according to requirements, and does not include use of such in energizing installed equipment in a highly complex, interdependent and interconnected electricity supply Network system, where the effects of unintended consequences on the system are high risk</li> </ul>
Equipment	<p>May include:</p> <ul style="list-style-type: none"> <li>• Pump</li> <li>• filter press</li> <li>• hoses, pipes</li> <li>• soil kits</li> <li>• sample bottles</li> <li>• storage vessels, etc.</li> </ul>

### Evidence Guide

Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace</li> <li>• procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> </ul>
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	<ul style="list-style-type: none"> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Alternating current principles – power</li> <li>• Electromagnetic principles</li> <li>• Engineering applications of mathematical principles</li> <li>• Engineering applications of mechanical principles</li> <li>• Engineering applications of material properties.</li> <li>• Filtering and sampling oil and the environment</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• safe working practices and applying OHS practices</li> <li>• Basic rigging techniques</li> <li>• Stores procedures</li> <li>• Filtering and sampling of insulating oil</li> <li>• Generation power systems</li> <li>• Transmission, distribution and rail power systems</li> <li>• Substations, power transformers and reactors</li> <li>• Power line safety practices</li> <li>• Switchgear installation</li> </ul>
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	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III	
Unit Title	Apply Quality Control
Unit Code	<a href="#">EIS DNI3 30 0612</a>
Unit Descriptor	This unit of competence covers the knowledge, attitudes and skills required in applying quality control in the work operation.

Elements	Performance Criteria
1. Establish quality standards	1.1 Quality standard procedures in work processes and operations are developed and agreed upon. 1.2 Quality standard procedures are documented in accordance with the organization policy 1.3 Standard procedures are introduced to organizational staff / personnel 1.4 Standard procedures are revised / updated when necessary
2. Assess quality of service delivered	2.1 Services delivered are <b>checked</b> against organization <b>quality standards</b> and specifications 2.2 Service delivered are evaluated using the appropriate evaluation <b>parameters</b> 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 <b>quality standards</b> 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

Variable	Range
Quality check	<ul style="list-style-type: none"> <li>• Check against specifications</li> <li>• Visual inspection</li> <li>• Physical inspection</li> </ul>
Quality standards	<p>May include but not limited to:</p> <ul style="list-style-type: none"> <li>• materials</li> <li>• output/performance (workmanship)</li> <li>• maintenance process</li> </ul>
Quality parameters	<ul style="list-style-type: none"> <li>• standard design/specifications</li> <li>• material specification</li> <li>• work performance and / or work reliability</li> </ul>

Evidence Guide	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• checked completed work continuously against organization standard</li> <li>• identified and isolated faulty or poor service</li> <li>• checked service delivered against organization standards</li> <li>• identified and applied corrective actions on the causes of identified faults or error</li> <li>• recorded basic information regarding quality performance</li> <li>• investigated causes of deviations of services against standard</li> <li>• recommended suitable preventive actions</li> </ul>
Underpinning Knowledge	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Relevant quality standards, policies and procedures</li> <li>• Characteristics of services</li> <li>• Safety environment aspects of service processes</li> <li>• Relevant evaluation techniques and quality checking procedures</li> <li>• Workplace procedures and reporting procedures</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Interpret work instructions, specifications and standards appropriate to the required work or service</li> <li>• Carry out relevant performance evaluation</li> <li>• Maintain accurate work records within procedures</li> <li>• Meet work specifications and requirements</li> <li>• Communicate effectively within defined workplace procedures</li> </ul>
Resource Implications	<p>Access to relevant workplace or appropriately simulated environment and materials relevant to the activity/ task</p>
Methods of Assessment	<p>Competence may be accessed through:</p> <ul style="list-style-type: none"> <li>• Interview/ Written Test</li> <li>• Observation/ Demonstration with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the workplace or in a simulated workplace setting</p>

Occupational Standard: Power Distribution Network Infrastructure/ System Installation and Maintenance Level III	
Unit Title	Lead Workplace Communication
Unit Code	<a href="#">EIS DNI3 31 0612</a>
Unit Descriptor	This unit of competence covers the skills required to exercise effective communication skills among staff and stakeholders to support the delivery of services within the industry

Elements	Performance Criteria
1. Identify relationship with in the organization internally and externally	<p>1.1 Develop, review and revise personal skills in communication as an ongoing priority to address organization standards</p> <p>1.2 Exercise caution in communicating personal information by oral and written means to ensure confidentiality of staff and stakeholders and staff matters</p> <p>1.3 Routinely apply workplace protocols and procedures in all workplace communication to support accuracy and understanding of information provided and received</p> <p>1.4 Recognize individual and cultural differences and make any adjustments needed to facilitate the achievement of identified outcomes</p> <p>1.5 Conduct interpersonal communication with team and client in a manner that enhances a staff and stakeholders centre within organization standards</p> <p>1.6 Take appropriate measures to resolve conflict and interpersonal differences in the workplace</p>
2. Exercise effective communication techniques within work environment and follow routine instructions	<p>2.1 <b>Special needs</b> of staff and stakeholders are identified and responded</p> <p>2.2 All <b>communication</b> with staff and stakeholders are ensured to reflect an understanding and respect for <b>individual differences</b> and needs</p> <p>2.3 Ensure communication is clear and relevant to situation, context and activities undertaken</p> <p>2.4 Seek advice about <b>communication</b> difficulties with staff and stakeholders or client from supervisor or other <b>appropriate person</b> and implement as required</p> <p>2.5 Adjust own style to incorporate advice that addresses performance issues to maintain the agreed standard of effective <b>communication</b></p> <p>2.6 Ensure work place instructions are interpreted correctly and carried out within agreed timeframes</p> <p>2.7 Seek clarification of work instructions, <b>tools and equipment</b> when required to ensure understanding</p>



	2.8 Refer any difficulties in carrying out instructions to supervisor or appropriate person to ensure required work outcomes
3. Identify and provide effective response to staff and stakeholders enquiries	3.1 Evaluate practice to maintain a high standard of staff and stakeholders service 3.2 Identify and acknowledge enquirer's expectations 3.3 Discuss any unresolved concerns or issues with enquirers 3.4 Give feedback for staff and stakeholders according to workplace guidelines and ethics

Variable	Range
Communication	May include but not limited to: <ul style="list-style-type: none"> <li>• Appropriate language</li> <li>• communication aids</li> <li>• modes of communication</li> <li>• questioning</li> <li>• clarifying</li> <li>• advising, providing appropriate and accurate information</li> <li>• honesty and integrity</li> </ul>
Special needs	May include but not limited to: <ul style="list-style-type: none"> <li>• Disability</li> <li>• Communication difficulties</li> <li>• Language difficulties</li> </ul>
Tools and equipment	May include but not limited to: <ul style="list-style-type: none"> <li>• Telephone</li> <li>• Fax</li> <li>• Computer</li> </ul>
Individual differences :	May include but not limited to: <ul style="list-style-type: none"> <li>• Developmental</li> <li>• Cultural</li> <li>• Physical</li> <li>• Emotional</li> <li>• Behavioral</li> <li>• Intellectual</li> </ul>

Evidence Guide	
Critical Aspects of Competence	Demonstrates skills and knowledge in: <ul style="list-style-type: none"> <li>• Demonstrate compliance with accepted Drafting Standard</li> <li>• Apply conventional graphic quality</li> <li>• Demonstrate precision in dimensioning and accuracy in description</li> <li>• Demonstrate consistent style of presentation</li> </ul>

	<ul style="list-style-type: none"> <li>• Demonstrate ability in systematic filing and cataloguing</li> <li>• Demonstrate efficient use of space</li> <li>• Easy access to technical documents in soft copy or hard copy</li> <li>• specified essential knowledge as well as skills as specified in elements and performance criteria of the unit of competence</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Principles of computer aided drafting (Auto CAD, Terra model, Eagle point)</li> <li>• Techniques and sequence of design &amp; drawing process</li> <li>• Principles of drafting standards</li> <li>• Techniques of technical report writing</li> <li>• Techniques of filing system</li> <li>• Procedures of submittal requirements</li> <li>• Basic management</li> <li>• Effective communication strategies</li> <li>• Principles and practices of services provided</li> <li>• Organization policies, procedures and guidelines</li> <li>• Legal and ethical issues relating to practitioner — staff and stakeholders relations</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Apply computer aided drafting</li> <li>• Verify technical data and documents</li> <li>• managing</li> <li>• Check technical documents</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview/Written Test</li> <li>• Observation/Demonstration with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III	
Unit Title	Lead Small Teams
Unit Code	<a href="#">EIS DNI3 32 0612</a>
Unit Descriptor	This unit of competence covers the skills, knowledge and attitudes required to determine individual and team development needs and facilitate the development of the work group.

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

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

Variable	Range
Learning and development needs	<ul style="list-style-type: none"> <li>• Coaching, mentoring and/or supervision</li> <li>• Formal/informal learning program</li> <li>• Internal/external training provision</li> <li>• Work experience/exchange/opportunities</li> <li>• Personal study</li> <li>• Career planning/development</li> <li>• Performance appraisals</li> <li>• Workplace skills assessment</li> <li>• Recognition of prior learning</li> </ul>
Organizational requirements	<ul style="list-style-type: none"> <li>• Quality assurance and/or procedures manuals</li> <li>• Goals, objectives, plans, systems and processes</li> <li>• Legal and organizational policy/guidelines and requirements</li> <li>• Safety policies, procedures and programs</li> <li>• Confidentiality and security requirements</li> <li>• Business and performance plans</li> <li>• Ethical standards</li> <li>• Quality and continuous improvement processes and standards</li> </ul>
Feedback on performance	<ul style="list-style-type: none"> <li>• Formal/informal performance appraisals</li> <li>• Obtaining feedback from supervisors and colleagues</li> <li>• Obtaining feedback from clients</li> <li>• Personal and reflective behavior strategies</li> <li>• Routine and organizational methods for monitoring service delivery</li> </ul>
Learning delivery methods	<ul style="list-style-type: none"> <li>• On the job coaching or mentoring</li> <li>• Problem solving</li> <li>• Presentation/demonstration</li> <li>• Formal course participation</li> </ul>

	<ul style="list-style-type: none"> <li>• Work experience</li> <li>• Involvement in professional networks</li> <li>• Conference and seminar attendance</li> <li>• Induction</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Identified and implemented learning opportunities for others</li> <li>• Gave and received feedback constructively</li> <li>• Facilitated participation of individuals in the work of the team</li> <li>• Negotiated learning plans to improve the effectiveness of learning</li> <li>• Prepared learning plans to match skill needs</li> <li>• Accessed and designated learning opportunities</li> </ul>
Underpinning Knowledge and Attitude	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Coaching and mentoring principles</li> <li>• Understanding how to work effectively with team members who have diverse work styles, aspirations, cultures and perspective</li> <li>• Understanding how to facilitate team development and improvement</li> <li>• Understanding methods and techniques for eliciting and interpreting feedback</li> <li>• Understanding methods for identifying and prioritizing personal development opportunities and options</li> <li>• Knowledge of career paths and competence standards in the industry</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Ability to read and understand a variety of texts, prepare general information and documents according to target audience; spell with accuracy; use grammar and punctuation effective relationships and conflict management</li> <li>• Communication skills including receiving feedback and reporting, maintaining effective relationships and conflict management</li> <li>• Planning skills to organize required resources and equipment to meet learning needs</li> <li>• Coaching and mentoring skills to provide support to colleagues</li> <li>• Reporting skills to organize information; assess information for relevance and accuracy; identify and elaborate on learning outcomes</li> <li>• Facilitation skills to conduct small group training sessions</li> <li>• Ability to relate to people from a range of social, cultural, physical and mental backgrounds</li> </ul>

Resource Implications	Access to relevant workplace or appropriately simulated environment where assessment can take place.
Methods of Assessment	Competence may be assessed through: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III	
Unit Title	Improve Business Practice
Unit Code	<a href="#">EIS DNI3 33 0612</a>
Unit Descriptor	This unit of competence covers the skills, knowledge and attitudes required in promoting, improving and growing business operations.

Elements	Performance Criteria
1. Diagnose the business	1.1 <b>Data required</b> for diagnosis is determined and acquired 1.2 <b>Competitive advantage</b> of the business is determined from the data 1.3 <b>SWOT analysis</b> of the data is undertaken
2. Benchmark the business	2.1 Sources of relevant benchmarking data are identified 2.2 <b>Key indicators</b> 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 plans to improve business performance	3.1 A consolidated list of required improvements is developed 3.2 Cost-benefit ratios for required improvements are determined 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 <b>Organizational structures</b> are checked to ensure they are suitable
4. Develop marketing and promotional plans	4.1 The practice vision statement is reviewed 4.2 Practice <b>objectives</b> are developed/reviewed 4.3 Target markets are identified/refined 4.4 <b>Market research data</b> is obtained 4.5 <b>Competitor analysis</b> is obtained 4.6 <b>Market position</b> is developed/reviewed 4.7 Practice <b>brand</b> is developed 4.8 <b>Benefits</b> of practice/practice products/services are identified

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

Variable	Range
Data required includes:	<ul style="list-style-type: none"> <li>• organization capability</li> <li>• appropriate business structure</li> <li>• level of client service which can be provided</li> <li>• internal policies, procedures and practices</li> <li>• staff levels, capabilities and structure</li> <li>• market, market definition</li> <li>• market changes/market segmentation</li> <li>• market consolidation/fragmentation</li> <li>• revenue and revenue growth rate</li> <li>• level of commercial activity</li> <li>• expected revenue levels, short and long term</li> <li>• break even data</li> <li>• pricing policy</li> <li>• revenue assumptions</li> <li>• business environment</li> <li>• economic conditions</li> <li>• social factors</li> <li>• demographic factors</li> <li>• technological impacts</li> <li>• political/legislative/regulative impacts</li> <li>• competitors, competitor pricing and response to pricing</li> <li>• competitor marketing/branding</li> <li>• competitor products</li> </ul>
Competitive advantage includes:	<ul style="list-style-type: none"> <li>• services/products</li> <li>• fees</li> <li>• location</li> <li>• timeframe</li> </ul>
Objectives	<ul style="list-style-type: none"> <li>• Specific</li> </ul>



should be 'SMART' , that	<ul style="list-style-type: none"> <li>• Measurable</li> <li>• Achievable</li> <li>• Realistic</li> <li>• Time defined</li> </ul>
Market research data includes:	<ul style="list-style-type: none"> <li>• data about existing clients</li> <li>• data about possible new clients</li> <li>• data from internal sources</li> <li>• data from external sources such as: <ul style="list-style-type: none"> <li>• trade associations/journals</li> <li>• Yellow Pages small business surveys</li> <li>• libraries</li> <li>• Internet</li> <li>• Chamber of Commerce</li> <li>• client surveys</li> <li>• industry reports</li> <li>• secondary market research</li> <li>• primary market research such as: <ul style="list-style-type: none"> <li>• telephone surveys</li> <li>• personal interviews</li> <li>• mail surveys</li> </ul> </li> </ul> </li> </ul>
Competitor analysis	<ul style="list-style-type: none"> <li>• competitor offerings</li> <li>• competitor promotion strategies and activities</li> <li>• competitor profile in the market place</li> </ul>
SWOT analysis includes:	<ul style="list-style-type: none"> <li>• internal strengths such as staff capability, recognized quality</li> <li>• internal weaknesses such as poor morale, under-capitalization, poor technology</li> <li>• external opportunities such as changing market and economic conditions</li> <li>• external threats such as industry fee structures, strategic alliances, competitor marketing</li> </ul>
Key indicators may include:	<ul style="list-style-type: none"> <li>• salary cost and staffing</li> <li>• personnel productivity (particularly of principals)</li> <li>• profitability</li> <li>• fee structure</li> <li>• client base</li> <li>• size staff/principal</li> <li>• overhead/overhead control</li> </ul>
Organizational structures include:	<ul style="list-style-type: none"> <li>• Legal structure (partnership, Limited Liability Company, etc.)</li> <li>• organizational structure/hierarchy</li> <li>• reward schemes</li> </ul>
Market position should include data on:	<ul style="list-style-type: none"> <li>• product</li> <li>• the good or service provided</li> <li>• product mix</li> <li>• the core product - what is bought</li> <li>• the tangible product - what is perceived</li> <li>• the augmented product - total package of consumer</li> </ul>

	<ul style="list-style-type: none"> <li>• features/benefits</li> <li>• product differentiation from competitive products</li> <li>• new/changed products</li> <li>• Price and pricing strategies (cost plus, supply/demand, ability to pay, etc.)</li> <li>• Pricing objectives (profit, market penetration, etc.)</li> <li>• cost components</li> <li>• market position</li> <li>• distribution strategies</li> <li>• marketing channels</li> <li>• promotion</li> <li>• promotional strategies</li> <li>• target audience</li> <li>• communication</li> <li>• promotion budget</li> </ul>
Practice brand may include:	<ul style="list-style-type: none"> <li>• practice image</li> <li>• practice logo/letter head/signage</li> <li>• phone answering protocol</li> <li>• facility decor</li> <li>• slogans</li> <li>• templates for communication/invoicing</li> <li>• style guide</li> <li>• writing style</li> <li>• AIDA (attention, interest, desire, action)</li> </ul>
Benefits may include:	<ul style="list-style-type: none"> <li>• features as perceived by the client</li> <li>• benefits as perceived by the client</li> </ul>
Promotion tools include:	<ul style="list-style-type: none"> <li>• networking and referrals</li> <li>• seminars</li> <li>• advertising</li> <li>• press releases</li> <li>• publicity and sponsorship</li> <li>• brochures</li> <li>• newsletters (print and/or electronic)</li> <li>• websites</li> <li>• direct mail</li> <li>• telemarketing/cold calling</li> </ul>
Yield per existing client may be increased by:	<ul style="list-style-type: none"> <li>• raising charge out rates/fees</li> <li>• packaging fees</li> <li>• reduce discounts</li> <li>• sell</li> <li>• more services to existing clients</li> </ul>

### Evidence Guide

Critical Aspects of Competence	<p>The candidate must be able to demonstrate:</p> <ul style="list-style-type: none"> <li>• ability to identify the key indicators of business performance</li> <li>• ability to identify the key market data for the business</li> <li>• knowledge of a wide range of available information sources</li> </ul>
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	<ul style="list-style-type: none"> <li>• ability to acquire information not readily available within a business</li> <li>• ability to analyze data and determine areas of improvement</li> <li>• ability to negotiate required improvements to ensure implementation</li> <li>• ability to evaluate systems against practice requirements</li> <li>• and form recommendations and/or make recommendations</li> <li>• ability to assess the accuracy and relevance of information</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• data analysis</li> <li>• communication skills</li> <li>• computer skills to manipulate data and present information</li> <li>• planning skills and negotiation skills</li> <li>• problem solving</li> <li>• marketing principles</li> <li>• ability to acquire and interpret relevant data</li> <li>• current product and marketing mix</li> <li>• sources of relevant benchmarking data</li> <li>• use of market intelligence</li> <li>• development and implementation strategies of promotion and growth plans</li> </ul>
Underpinning Skills	<p>Demonstrate skills on:</p> <ul style="list-style-type: none"> <li>• data analysis and manipulation</li> <li>• ability to acquire and interpret required data</li> <li>• current practice systems and structures</li> <li>• methods of selecting relevant key benchmarking indicators</li> </ul>
Underpinning Skills	<ul style="list-style-type: none"> <li>• communication skills</li> <li>• working and consulting with others when developing plans for the business</li> <li>• negotiation skills and problem solving</li> <li>• using computers to manipulate, present and distribute information</li> <li>• planning skills</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• interview / written test</li> <li>• observation / demonstration</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting</p>

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level III	
Unit Title	Maintain Quality System and Continuous Improvement Processes (Kaizen)
Unit Code	<a href="#">EIS DNI3 34 1012</a>
Unit Descriptor	This unit of competence covers the skills and knowledge required to prevent process improvements in their own work from slipping back to former practices or digressing to less efficient practices. It covers responsibility for the day- to-day operation of the work/functional area and ensuring that quality system requirements are met and that continuous improvements are initiated and institutionalized.

Elements	Performance Criteria
1. Develop and maintain quality framework within work area	1.1 Distribute and explain information about the enterprise's quality system to personnel 1.2 Encourage personnel to participate in improvement processes and to assume responsibility and authority 1.3 Allocate responsibilities for quality within work area in accordance with quality system 1.4 Provide <b>coaching and mentoring</b> to ensure that personnel are able to meet their responsibilities and quality requirements
2. Maintain quality documentation	2.1 Identify required quality documentation, including records of improvement plans and initiatives 2.2 Prepare and maintain quality documentation and keep accurate data records 2.3 Maintain document control system for work area 2.4 Contribute to the development and revision of quality manuals and work instructions for the work area 2.5 Develop and implement inspection and test plans for quality controlled products
3. Facilitate the application of standardized procedures	3.1 Ensure all required procedures are accessible by relevant personnel 3.2 Assist personnel to access relevant procedures, as required 3.3 Facilitate the resolution of conflicts arising from job 3.4 Facilitate the completion of required work in accordance with standard procedures and practices

<p>4. Provide training in quality systems and improvement processes</p>	<p>4.1 Analyze roles, duties and current competency of relevant personnel</p> <p>4.2 Identify training needs in relation to quality system and <b>continuous improvement processes (kaizen)</b></p> <p>4.3 Identify opportunities for skills development and/or training programs to meet needs</p> <p>4.4 Initiate and monitor training and skills development programs</p> <p>4.5 Maintain accurate training record</p>		
<p>5. Monitor and review performance</p>	<p>5.1 Review performance outcomes to identify ways in which planning and operations could be improved</p> <p>5.2 Use the organization's systems and <b>technology</b> to monitor and review progress and to identify ways in which planning and operations could be improved</p> <p>5.3 Enhance <b>customer service</b> through the use of quality improvement techniques and processes</p> <p>5.4 Adjust plans and communicate these to personnel involved in their development and implementation</p>		
<p>6. Build continuous improvement process</p>	<p>6.1 Organize and facilitate improvement team</p> <p>6.2 Encourage work group members to routinely monitor <b>key process indicators</b></p> <p>6.3 Build capacity in the work group to critically review the relevant parts of the value chain</p> <p>6.4 Assist work group members to formalize improvement suggestions</p> <p>6.5 Facilitate relevant resources and assist work group members to develop implementation plans</p> <p>6.6 Monitor implementation of improvement plans taking appropriate actions to assist implementation where required.</p>		
<p>7. Facilitate the identification of improvement opportunities</p>	<p>7.1 Analyze the job completion process</p> <p>7.2 Ask relevant questions of job incumbent</p> <p>7.3 Encourage job incumbents to conceive and suggest improvements</p> <p>7.4 Facilitate the trying out of improvements, as appropriate</p>		
<p>8. Evaluate relevant components of quality system</p>	<p>8.1 Undertake regular audits of components of the quality system that relate to the work area</p> <p>8.2 Implement improvements in the quality system in accordance with own level of responsibility and workplace procedures</p> <p>8.3 Facilitate the updating of standard procedures and</p>		
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	practices 8.4 Ensure the capability of the work team aligns with the requirements of the procedure
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Variable	Range
Coaching and mentoring	May refer to: <ul style="list-style-type: none"> <li>• providing assistance with problem-solving</li> <li>• providing feedback, support and encouragement</li> <li>• teaching another member of the team, usually focusing on a specific work task or skill</li> </ul>
Continuous improvement processes may include:	May include: <ul style="list-style-type: none"> <li>• cyclical audits and reviews of workplace, team and individual performance</li> <li>• evaluations and monitoring of effectiveness</li> <li>• implementation of quality systems, such as International Standardization for Organization (ISO)</li> <li>• modifications and improvements to systems, processes, services and products</li> <li>• policies and procedures which allow the organization to systematically review and improve the quality of its products, services and procedures</li> <li>• seeking and considering feedback from a range of stakeholders</li> <li>• Kaizen</li> <li>• Enterprise-specific improvement systems</li> </ul>
Technology	May include: <ul style="list-style-type: none"> <li>• computerized systems and software such as databases, project management and word processing</li> <li>• telecommunications devices</li> <li>• any other technology used to carry out work roles and responsibilities</li> </ul>
Customer service	May be: <ul style="list-style-type: none"> <li>• internal or external</li> <li>• to existing, new or potential clients</li> </ul>
Key process indicators	Key process indicators may include: <ul style="list-style-type: none"> <li>• statistical process control data/charts</li> <li>• orders</li> <li>• lost time, injury and other OHS records</li> <li>• equipment reliability charts, etc.</li> </ul>
Continuous improvement tools	May include: <ul style="list-style-type: none"> <li>• statistics</li> <li>• cause and effect diagrams</li> <li>• fishbone diagram</li> <li>• Pareto diagrams</li> <li>• run charts</li> </ul>

	<ul style="list-style-type: none"> <li>• X bar R charts</li> <li>• PDCA</li> <li>• Sigma techniques</li> <li>• balanced scorecards</li> <li>• benchmarking</li> <li>• performance measurement</li> <li>• upstream and downstream customers</li> <li>• internal and external customers immediate and/or final</li> </ul>
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<b>Evidence Guide</b>	
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Critical Aspects of Competence	<p>Evidence of the following is essential:</p> <ul style="list-style-type: none"> <li>• taking active steps to implement, monitor and adjust plans, processes and procedures to improve performance</li> <li>• supporting others to implement the continuous improvement system/processes, and to identify and report opportunities for further improvement</li> <li>• knowledge of principles and techniques associated with continuous improvement systems and processes</li> <li>• assist others to follow standard procedures and practices</li> <li>• assist others make improvement suggestions</li> <li>• standardize and sustain improvements</li> </ul> <p>Assessors should ensure that candidates can:</p> <ul style="list-style-type: none"> <li>• implement and monitor defined quality system</li> <li>• requirements and initiate continuous improvements within the work area</li> <li>• apply effective problem identification and problem solving techniques</li> <li>• strengthen customer service through a focus on continuous improvement</li> <li>• implement, monitor and evaluate quality systems in the work area</li> <li>• initiate quality processes to enhance the quality of performance of individuals and teams in the work area</li> <li>• gain commitment of individuals/teams to quality principles and practices</li> <li>• implement effective communication strategies</li> <li>• encourage ideas and feedback from team members when developing and refining techniques and processes</li> <li>• analyze training needs and implement training programs</li> <li>• prepare and maintain quality and audit documentation</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• principles and techniques associated with: <ul style="list-style-type: none"> <li>– benchmarking</li> <li>– best practice</li> <li>– change management</li> <li>– continuous improvement systems and processes</li> <li>– quality systems</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• range of procedures available and their application to different jobs</li> <li>• applicability of takt time and muda to jobs</li> <li>• identification and possible causes of variability in jobs</li> <li>• continuous improvement process for organization</li> <li>• questioning techniques</li> <li>• methods of conceiving improvements</li> <li>• suggestion and try out procedures</li> <li>• relevant OHS</li> <li>• quality measurement tools for use in continuous improvement processes</li> <li>• established communication channels and protocols</li> <li>• communication/reporting protocols</li> <li>• continuous improvement principles and process</li> <li>• enterprise business goals and key performance indicators</li> <li>• enterprise information systems management</li> <li>• enterprise organizational structure, delegations and responsibilities</li> <li>• policy and procedure development processes</li> <li>• relevant health, safety and environment requirements</li> <li>• relevant national and international quality standards and protocols</li> <li>• standard operating procedures (SOPs) for the technical work performed in work area</li> <li>• enterprise quality system</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• coach and mentor team members</li> <li>• gain the commitment of individuals and teams to continuously improve</li> <li>• innovate or design better ways of performing work</li> <li>• communicate with relevant people</li> <li>• prioritize and plan tasks related to encouraging and improving use of standardized procedures</li> <li>• negotiate with others to resolve conflicts and gain commitment to standardized procedures</li> <li>• facilitate other employees in improvement activities</li> <li>• implement and monitor defined quality system requirements</li> <li>• initiate continuous improvements within the work area</li> <li>• apply effective problem identification and problem solving techniques</li> <li>• strengthen customer service through a focus on continuous improvement</li> <li>• implement, monitor and evaluate quality systems</li> <li>• implement effective communication strategies</li> <li>• encourage ideas and feedback from team members when developing and refining techniques and processes</li> <li>• analyze training needs and implementing training programs</li> <li>• prepare and maintain quality and audit documentation</li> </ul>



Resources Implication	<p>Access may be required to:</p> <ul style="list-style-type: none"> <li>• workplace procedures and plans relevant to work area</li> <li>• specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the candidate</li> <li>• documentation and information in relation to production, waste, overheads and hazard control/management</li> <li>• enterprise quality manual and procedures</li> <li>• quality control data/records</li> </ul>
Methods of Assessment	<p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> <li>• demonstration in the workplace</li> <li>• suitable simulation</li> <li>• oral or written questioning to assess knowledge of procedures and contingency management; principles and techniques associated with change management</li> <li>• review of the audit process and outcomes generated by the candidates</li> </ul> <p>Those aspects of competence dealing with improvement processes could be assessed by the use of suitable simulations and/or a pilot plant and/or a range of case studies and scenarios.</p> <p>In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those aspects of competence which are difficult to assess directly.</p>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated workplace setting / environment.</p>

# NTQF Level IV

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<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Operate Plant and Equipment Near Live Electrical Conductors/ Apparatus</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 01 0612</u></a>
<b>Unit Descriptor</b>	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 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.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare to operate plant and equipment near energized and exposed electrical conductors/ apparatus	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection.</p> <p>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.</p> <p>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.</p> <p>1.4 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>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.</p> <p>1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.</p> <p>1.7 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.</p> <p>1.8 Relevant personnel at worksite are confirmed current in First</p>
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	<p>Aid, Pole Top Rescue and other related work procedures according to requirements.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p> <p>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.</p> <p>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.</p> <p>1.12 Road signs, barriers and warning devices are positioned in accordance with requirements.</p>		
<p>2. Carry out the operation of plant and equipment near energized and exposed electrical conductors/apparatus</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>2.4 Plant and equipment are safely operated near energized and exposed electrical conductors/apparatus according to requirements and established procedures.</p> <p>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.</p> <p>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.</p> <p>2.7 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.</p> <p>2.8 Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.</p>		
<p>3. Complete the operation</p>	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in</p>		
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of plant and equipment near energized and exposed electrical conductors/ apparatus	<p>accordance with established procedures.</p> <p>3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.</p> <p>3.3 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.</p> <p>3.4 <b>Tools, equipment</b> and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.5 Relevant work permit(s) are signed off and, <b>plant and equipment</b> are checked, returned to service/stored appropriately, in accordance with requirements and established procedures.</p> <p>3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified.</p>
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Variable	Range
This unit may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>• the operation of plant and equipment near live electrical conductors and/or apparatus</li> </ul>
Support plant may include:	<ul style="list-style-type: none"> <li>• elevating work platform</li> <li>• back hoes</li> <li>• earth drilling rigs</li> <li>• trench excavators</li> <li>• heavy vehicles</li> <li>• concrete cutters</li> <li>• compressors</li> <li>• portable generators</li> <li>• welders</li> <li>• crimper-cutters</li> <li>• pumps</li> <li>• chain-saws</li> <li>• jack-hammers</li> <li>• post hole diggers</li> <li>• sand-blasters, drills</li> <li>• self-loading vehicle</li> </ul>
Equipment may include:	<ul style="list-style-type: none"> <li>• hand operated ratchet and friction grip winches</li> <li>• chain pullers and block and tackle</li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> </ul>

	<ul style="list-style-type: none"> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices.</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>			
<b>Critical Aspects of Competence</b>	Assessment requires evidence that the candidate: <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>		
<b>Underpinning Knowledge and Attitudes</b>	<ul style="list-style-type: none"> <li>• Basic electrical principles</li> <li>• Magnetism and Electromagnetic principles</li> <li>• Electro technology science and materials</li> <li>• Hand tools and Power tools</li> <li>• Occupational Health and Safety principles</li> <li>• Engineering applications of mathematical principles</li> <li>• Engineering applications of mechanical principles</li> <li>• Engineering applications of material properties</li> <li>• Elevating work platform operational principles</li> <li>• Hydraulic and pneumatic portable equipment</li> <li>• Enterprise vehicles</li> <li>• Chain saw principles</li> <li>• Environmental fundamentals</li> <li>• Enterprise specific - policy and procedure instructions</li> <li>• Enterprise specific - technical drawings and documents</li> </ul>		
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Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• use hand tools</li> <li>• use power tools</li> <li>• apply occupational health and safety practices</li> <li>• apply electrical safe working practice</li> <li>• operate enterprise vehicles</li> <li>• apply chain saw practices</li> <li>• generate power systems</li> <li>• perform material handling and the environment</li> <li>• enterprise specific - OHS instructions</li> </ul>
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	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV	
Unit Title	Implement and Monitor the Organizational OHS Policies, Procedures and Programs
Unit Code	<a href="#">EIS DNI4 02 0612</a>
Unit Descriptor	This unit 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
1. Prepare/Plan to implement and monitor the organizational OHS policies, procedures and programs	<p>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.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 <b>Hazards</b> are identified, <b>OHS risks</b> assessed and control measures are prioritized, implemented and monitored including emergency exits kept clear, to ensure safe systems of <b>work</b> are followed and according to established <b>procedures</b>.</p> <p>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.</p> <p>1.5 Risk control measures are identified, prioritized, implemented and evaluated against the work schedule.</p> <p>1.6 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.</p> <p>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.</p> <p>1.8 Clients/Customers are provided with alternative methods within the scope, acceptable cost and requirements.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are</p>



	<p>resolved and activities coordinated to carry out work.</p> <p>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.</p> <p>1.11 Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities authorized and coordinated where applicable in accordance with established procedures.</p> <p>1.12 Positioning of road signs, barriers and warning devices is planned in accordance with traffic control management requirements and established procedures.</p>
<p>2. Carry out the implementation and monitoring of the organizational OHS policies, procedures and programs</p>	<p>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.</p> <p>2. 2 First Aid, Pole Top Rescue and other related work procedures are performed according to requirements and/or established procedures.</p> <p>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.</p> <p>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.</p> <p>2. 5 Remedial actions are taken to overcome any shortfalls encountered in the work schedule according to requirements and/or established procedures.</p> <p>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.</p> <p>2. 7 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.</p> <p>2. 8 Solutions to non-routine problems are identified and</p>

	<p>implemented using acquired essential knowledge and associated skills according to requirements.</p> <p>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.</p>
3. Complete the implementation and monitoring of the organizational OHS policies, procedures and programs	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures.</p> <p>3.2 Accidents, incidents and/or injuries are reported in accordance with requirements/established procedures.</p> <p>3.3 Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures.</p> <p>3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>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.</p> <p>3.6 Works completion records, reports, as installed /modified drawing(s) and/or documentation and information are confirmed, processed and appropriate personnel notified.</p>

Variable	Range
In accordance with all relevant OHS legislation, particularly:	<ul style="list-style-type: none"> <li>• general duty of care</li> <li>• requirements for maintenance and confidentiality of records of occupational injury and disease</li> <li>• provision of information and training</li> <li>• regulations and codes of practice relating to hazards present in work area</li> <li>• health and safety representatives and OHS committees</li> <li>• issue resolution</li> </ul>
Hazardous events include:	<ul style="list-style-type: none"> <li>• accidents, fire and emergencies such as chemical spills or bomb scares</li> </ul>
Procedures for dealing with them include:	<ul style="list-style-type: none"> <li>• evacuation, chemical containment and first aid</li> <li>• procedures</li> </ul>
In accordance with workplace procedures for:	<ul style="list-style-type: none"> <li>• risk assessment and management; inspection</li> <li>• housekeeping; participative arrangements , either general or specific to OHS training and assessment</li> <li>• specific hazard policies and procedures</li> <li>• OHS information</li> <li>• OHS record keeping</li> </ul>

	<ul style="list-style-type: none"> <li>• maintenance of plant and equipment</li> <li>• purchasing of supplies and equipment and</li> <li>• counseling/disciplinary processes</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• implementing and monitoring the organizational OHS policies, procedures and programs</li> <li>• Enterprise specific - policies and procedure instructions</li> <li>• Enterprise specific - OHS instructions</li> <li>• Enterprise specific - technical drawings and documents</li> </ul>
Underpinning Skills	<p>Demonstrates skills of:</p> <ul style="list-style-type: none"> <li>• Power line safety - implementation and monitoring</li> <li>• Power line safety practices</li> <li>• Power line installation safety</li> </ul>
Resources Implication	<p>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:</p> <ul style="list-style-type: none"> <li>• a range of emergencies and hazardous events (may be gathered through simulations),</li> <li>• document on current OHS Acts, regulations and enterprise OHS policies and procedures</li> <li>• personal protective equipment (PPE)</li> </ul>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>

<b>Occupational Standard: Power Distribution Network Infrastructure/ System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Implement and Monitor Environmental and sustainable energy Management Policies and Procedures</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 03 0612</u></a>
<b>Unit Descriptor</b>	This unit specifies the outcomes for the collection, interpretation and application of environmental management information, identification of environmental impacts and assessment of risks and establishment of best practice procedures for implementation of the management plans to ensure compliance. It also consists of monitoring during the implementing of, environmental and sustainable energy polices and plans and, development of modifications as part of the review process.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare/plan to implement and monitor environmental and sustainable energy management policies and procedures	<p>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.</p> <p>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.</p> <p>1.3 Relevant requirements and established procedures for the work are to all personnel and identified for all work sites.</p> <p>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.</p> <p>1.5 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.</p> <p>1.6 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.</p> <p>1.7 Clients/Customers are provided with possible solutions and/or options within the scope, acceptable cost and requirements.</p> <p>1.8 Liaison and communication issues with other/authorized</p>

	<p>personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work.</p> <p>1.9 Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities authorized and coordinated where applicable in accordance with established procedures.</p> <p>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.</p> <p>1.11 Positioning of road signs, barriers and warning devices is planned in accordance with requirements, traffic control management requirements and established procedures.</p>
<p>2. Carry out the implementation and monitoring of environmental and sustainable energy management policies and procedures</p>	<p>2. 1 OHS and sustainable energy principles and practices to reduce <b>the incidents of accidents</b> and minimize waste are implemented and monitored and implemented in accordance with requirements and/or established procedures.</p> <p>2. 2 First Aid, Pole Top Rescue and other related work procedures are performed according to requirements and/or established procedures.</p> <p>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.</p> <p>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.</p> <p>2. 5 Remedial actions are taken to overcome any shortfalls encountered in the work schedule according to requirements and/or established procedures.</p> <p>2. 6 Implementation and monitoring of <b>environmental</b> and sustainable energy management policies and procedures are carried out, in accordance with the work schedule and requirements and/or established procedures.</p> <p>2. 7 Essential knowledge and associated skills in the safe implementation and monitoring of <b>environmental and sustainable energy management policies and procedures</b> is applied to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2. 8 Solutions to non-routine problems are identified and</p>

	<p>implemented using acquired essential knowledge and associated skills according to requirements.</p> <p>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.</p>
<p>3. Complete the implementation and monitoring of environmental and sustainable energy management policies and procedures</p>	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures.</p> <p>3.2 Accidents, incidents and/or injuries are reported and followed up in accordance with requirements/established procedures.</p> <p>3.3 Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures.</p> <p>3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>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.</p> <p>3.6 Works completion records, reports, as installed /modified drawing(s) and/or documentation and information are confirmed, processed and appropriate personnel notified.</p>

Variable	Range
<p>Environmental legislation may include:</p>	<ul style="list-style-type: none"> <li>• relevant federal legislation</li> <li>• relevant state/territory legislation</li> <li>• relevant local government by-laws</li> <li>• relevant government or quasi government policies and regulations</li> <li>• relevant community planning and development agreements (e.g. Land care agreements)</li> </ul>
<p>Incidents of environmental impact may include:</p>	<ul style="list-style-type: none"> <li>• emissions to air</li> <li>• releases to/of water</li> <li>• releases to land; disposal of waste</li> <li>• contamination of land</li> <li>• impact on communities</li> <li>• destruction of habitat</li> <li>• use of energy sources</li> <li>• waste generation processes and technologies; extraction of water</li> <li>• changes to water temperature</li> </ul>

	<ul style="list-style-type: none"> <li>• changes to water salinity</li> <li>• regulation of water flow</li> <li>• land use; and may involve the implementation of emergency responses</li> </ul>
Environmental management documentation may include:	<ul style="list-style-type: none"> <li>• information on applicable environmental laws or other requirements</li> <li>• complaint records</li> <li>• training records</li> <li>• process information</li> <li>• process operational log books</li> <li>• inspection, maintenance and calibration records</li> <li>• relevant contractor and supplier information</li> <li>• incident reports</li> <li>• information on emergency preparedness and response</li> </ul>

<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• implementing and monitoring environmental and sustainable energy management policies and procedures</li> <li>• Environmental fundamentals</li> <li>• Enterprise specific - sustainable energy principles</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Power line environmental impact - implementation and monitoring</li> <li>• Power line sustainable energy management – implementation and monitoring</li> <li>• Enterprise specific - policies and procedure</li> <li>• instructions</li> <li>• Enterprise specific - OHS instructions</li> </ul>
Resources Implication	<p>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 below ground, in limited spaces, with different structural/construction types and method and in a variety of environments</p>
Assessment Methods	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration/ Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Install and Maintain Traction Network Wiring System</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 04 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the installation and maintenance of overhead traction wiring systems to ensure their proper installation, in particular the correct registration of the contact wire with respect to the current collectors. It includes the undertaking of safe working practices on or about the running line/track and the preparation needed for stringing and profiling including the isolation of systems and circuits for safe working according to work plans, the diagnosis of faults and the modification and re-adjustment to appropriate standards. It may also encompass the correct positioning of road signs, barriers and or warning devices, and the procedure of issuing/accepting electrical permits. It also includes the visual and other necessary checks to confirm that equipment and associated hardware have been correctly installed according to design and are in a safe condition to undertake pre-commissioning tests prior to, putting into service, and updating of, installation and maintenance data such as as-built drawings and relevant quality assurance documentation.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare/plan to install and maintain traction network wiring systems	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analyzed and confirmed, if necessary, by site inspection.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the installation and maintenance of traction network wiring systems are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>1.4 Work is prioritized and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>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.</p> <p>1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established</p>



	<p>procedures.</p> <p>1.7 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.</p> <p>1.8 Relevant personnel at worksite are confirmed current in CPR, first aid, and other rescue procedures and related work procedures according to requirements.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved to carry out work where necessary.</p> <p>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.</p> <p>1.11 Personnel participating in the work, including <b>plant operators and contractors</b>, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.</p> <p>1.12 Rail/Road signs, barriers and warning devices are positioned in accordance with requirements.</p> <p>1.13 Environmental constraints applicable to work are identified and control measures applied</p>		
<p>2. Carry out the installation and maintenance of traction network wiring systems</p>	<p>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.</p> <p>2.2 Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.</p> <p>2.3 System Installation and circuits are isolated as required, proved safe to work on in accordance with the requirements/permits and established procedure</p> <p>2.4 Apply essential knowledge and associated skills in the safe installation and maintenance of traction network wiring systems to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.5 Overhead traction wiring systems, including cables, fittings, <b>traction conductors and associated equipment</b> are installed according to design and work schedule requirements and established procedures.</p> <p>2.6 <b>Maintenance</b>, including repair and/or replacement of overhead traction wiring systems, including the modification and re-adjustment of overhead traction conductors is carried out, in accordance with the work</p>		
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	<p>schedule and requirements/established procedures.</p> <p>2.7 Profiling is completed according to established procedures.</p> <p>2.8 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.</p> <p>2.9 Unplanned events in the installation and maintenance of traction network wiring systems are undertaken within the scope of established procedures.</p> <p>2.10 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.</p> <p>2.11 Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.</p>
3. Complete the installation and maintenance of traction network wiring systems	<p>3.1 Work undertaken is checked against design drawings and works schedule for conformance with requirements and anomalies reported in accordance with established procedures.</p> <p>3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.</p> <p>3.3 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.</p> <p>3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.5 Relevant work permit(s) are signed off and, the overhead traction network wiring system is returned to service in accordance with requirements.</p> <p>3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalized and processed and appropriate personnel notified.</p>

Variable	Range
This unit may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>the installation and maintenance of traction network wiring systems as it relates to the correct registration of the contact wire with respect to the current collectors</li> </ul>
Types of conductor may include:	<ul style="list-style-type: none"> <li>HD</li> <li>CAD</li> <li>tin bearing and magnesium copper</li> <li>aluminums</li> <li>steel</li> <li>aluminum conductor steel reinforced (ACSR)</li> <li>insulated screened and unscreened cable and</li> <li>pilot and control cables</li> </ul>

Materials and equipment may include:	<ul style="list-style-type: none"> <li>• porcelain</li> <li>• glass</li> <li>• ceramic</li> <li>• fiber glass and composite insulators</li> <li>• steel</li> <li>• brass</li> <li>• stainless steel</li> <li>• neoprene</li> <li>• copper</li> <li>• cast and galvanized fittings</li> <li>• drums</li> <li>• pulleys</li> <li>• hooks,</li> <li>• yoke plate</li> <li>• line grips</li> <li>• tensioning devices</li> <li>• ropes</li> <li>• slings</li> <li>• hydraulic/manual crimping and cutting tools</li> <li>• specialized tools and dynamometers</li> <li>• Conductors and support wires include droppers wire</li> <li>• catenaries wire</li> <li>• contact/trolley wire</li> <li>• earth wire</li> <li>• feeder wire</li> <li>• drape/potential jumper wire</li> <li>• stay wire</li> <li>• cross-span</li> <li>• networks and</li> <li>• head span wire</li> </ul>
Associated equipment to conductors may include:	<ul style="list-style-type: none"> <li>• registration arms</li> <li>• midpoint anchors</li> <li>• section insulators</li> <li>• neutral sections</li> <li>• supports</li> <li>• cantilevers</li> <li>• portals</li> <li>• drop verticals</li> <li>• surge diverters and tensioning devices</li> </ul>
Maintenance may include:	<ul style="list-style-type: none"> <li>• the removal</li> <li>• repair and replacement of cables</li> <li>• conductors and associated hardware</li> </ul>
Conductors and support wires include:	<ul style="list-style-type: none"> <li>• droppers wire</li> <li>• catenaries wire</li> <li>• contact/trolley wire</li> <li>• earth wire</li> <li>• feeder wire</li> <li>• drape/potential jumper wire</li> <li>• stay wire</li> <li>• cross-span</li> <li>• networks and head span wire</li> </ul>

<p>Associated equipment to conductors may include:</p>	<ul style="list-style-type: none"> <li>• registration arms</li> <li>• midpoint anchors</li> <li>• section insulators</li> <li>• neutral sections</li> <li>• supports</li> <li>• cantilevers</li> <li>• portals</li> <li>• drop verticals</li> <li>• Surge diverters and tensioning devices</li> </ul> <p>Plant may include ladders</p> <ul style="list-style-type: none"> <li>• elevating work platform</li> <li>• winches and capstans</li> <li>• Specialist tensioning stringing equipment</li> <li>• cable trailers and drum stands</li> <li>• rail and road rail mounted overhead wiring vehicles</li> </ul> <p>Installing tension regulators encompasses:</p> <ul style="list-style-type: none"> <li>• fitting</li> <li>• positioning and securing weight chains and pulley systems</li> </ul> <p>Permits may include:</p> <ul style="list-style-type: none"> <li>• access permits</li> <li>• permits to work and or other relevant permits and documents by recognized bodies</li> <li>• Profiling encompasses sag, tension, encumbrances, offsets, cants and registration which involves horizontal and vertical calibration of the contact wire or trolley wire to a design height and stagger in reference to the running rail</li> <li>• current collectors may include pantographs and tram trolley poles</li> </ul>		
<p>The following constants and variables included in this unit:</p>	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> </ul>		
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	<ul style="list-style-type: none"> <li>• Legislation</li> <li>• MSDS</li> <li>• OHS practices and OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Electrical traction principles</li> <li>• Electrical traction protection requirements</li> <li>• Electrical overhead wiring traction systems</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• safe working practices and applying OHS practices</li> <li>• Electrical traction</li> <li>• Electrical traction protection requirements</li> <li>• Electrical overhead wiring traction systems</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV	
Unit Title	Analyze and Appraise Fault and Outage Data
Unit Code	<a href="#">EIS DNI4 05 0612</a>
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	Performance Criteria
1. Plan and coordinate for the analysis and appraisal of fault and outage data	<p>1.1 OHS practices/procedures and Environmental and sustainable energy procedures, which may influence the analysis and <b>appraisal of fault and outage data</b>, are reviewed and determined.</p> <p>1.2 Purpose of the analysis/appraisal is established and expected outcomes of the work are confirmed with the appropriate personnel.</p> <p>1.3 Organizational established procedures on policies and specifications for the design are obtained or established with the appropriate personnel.</p> <p>1.4 Equipment/tools and personal protective equipment are selected and coordinated based on specified requirements and established procedures</p> <p>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</p> <p>1.6 Risk control measures are identified, prioritized and evaluated against the work schedule</p> <p>1.7 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures</p> <p>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</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land-owners are resolved and activities coordinated to carry out work</p> <p>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</p>
2. Carry out and coordinate the	2.1 Personnel participating in the work, including plant operators and contractors, are fully briefed and respective

<p>analysis and appraisal of fault and outage data</p>	<p>responsibilities coordinated and authorized where applicable in accordance with established procedures</p> <p>2.2 Positioning of road signs, barriers and warning devices is planned in accordance with requirements2.3 Circuit/system modeling is used to evaluate alternative proposals as per established procedures.</p> <p>2.3 Circuit/system modeling is used to evaluate alternative proposals as per established procedures.</p> <p>2.4 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</p> <p>2.5 Analysis \ Appraisal decisions are made on the basis of safety and effective outcomes according to requirements and/or established procedures</p> <p>2.6 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</p> <p>2.7 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</p> <p>2.8 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.</p>
<p>3. Complete and coordinate the analysis and appraisal of fault and outage data</p>	<p>3.1 Solutions to non-routine problems are identified and implemented using acquired essential knowledge and associated skills according to requirements</p> <p>3.2 Quality of work is monitored against personal performance agreement and/or established organizational and professional standards.</p> <p>3.3 Final inspections of the analysis/appraisal are undertaken to ensure they comply with all requirements and include all specifications and documentations needed to complete the design brief.</p> <p>3.4 Appropriate personnel are notified of completion and reports and/or completion documents are finalized .</p>

Variable	Range
<p>This unit shall/may be demonstrated in relation to the analysis and appraisal of fault and outage data and may include the following:</p>	<ul style="list-style-type: none"> <li>• Relevant protection systems,</li> <li>• both MV and LV (fuses and circuit breakers);</li> <li>• distribution feeders/networks (overhead and underground);</li> <li>• substations and transformers;</li> <li>• MV switchgear;</li> <li>• LV switchgear.</li> </ul>
<p>The following constants and variables included in this unit:</p>	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform.</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration.</li> <li>• Documenting detail work events, record keeping and or storage of information.</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation.</li> <li>• Environmental management documentation.</li> <li>• Established procedures.</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification.</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and / or permits to work</li> <li>• Personnel.</li> <li>• Quality assurance systems.</li> <li>• Requirements.</li> <li>• Safe design principles</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>



<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• implement occupational health and safety workplace procedures and practices including the use of risk control measures</li> <li>• apply sustainable energy principles and practices</li> <li>• conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Occupational Health and Safety principles</li> <li>• Occupational health and safety , enterprise responsibilities</li> <li>• MV principles</li> <li>• Power line safety - implementation and monitoring</li> <li>• Electrical equipment - protection and control schemes</li> <li>• Safe design principles</li> <li>• Switchgear installation</li> <li>• Low voltage switching principles</li> <li>• Medium Voltage switching principles</li> <li>• Medium Voltage fault switching principles</li> <li>• Medium Voltage distribution transformer principles</li> <li>• Medium Voltage SWER system</li> <li>• Feeder automation system</li> <li>• Analysis network event records</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Apply occupational health and safety principles</li> <li>• Apply MV practices</li> <li>• Implement and monitor power line safety</li> <li>• Electrical equipment - protection and control schemes</li> <li>• Safe design practices</li> <li>• Switchgear installation</li> <li>• Low voltage switching practices</li> <li>• Medium Voltage switching practices</li> <li>• Medium Voltage fault switching practices</li> <li>• Medium Voltage distribution transformer practices</li> <li>• Medium Voltage SWER system</li> <li>• Feeder automation system</li> <li>• Analysis network event records</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV	
Unit Title	Maintain Oil and Gas Filled Specialized Underground Cables
Unit Code	<a href="#">EIS DNI4 06 0612</a>
Unit Descriptor	This unit covers the maintenance and repair of oil and gas filled specialized underground cables. It includes testing, diagnosing faults, repairing and replacing the specialized cables. It also encompasses the processes for preliminary pressure control and leak repair, as well as working under induced voltages, cable identification and cable freezing.

Elements	Performance Criteria
1. Prepare/Plan to maintain oil and gas filled specialized underground cables	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and <b>material lists</b>, are obtained, analyzed, if necessary, by site inspection and the extent of the preparation of the work determined for planning and coordination.</p> <p>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.</p> <p>1.3 Risk control measures are identified, prioritized and evaluated against the work schedule.</p> <p>1.4 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>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.</p> <p>1.6 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.</p> <p>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.</p> <p>1.8 Clients/Customers are provided with possible solutions and/or options within the scope, acceptable cost and requirements.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work.</p>

	<p>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.</p> <p>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.</p> <p>1.12 Positioning of road signs, barriers and warning devices is planned in accordance with requirements.</p>
<p>2. Carry out maintenance of oil and gas filled specialized underground cables</p>	<p>2.1 OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimize waste are monitored and implemented in accordance with requirements and/or established procedures.</p> <p>2.2 First aid, rescue and other related work procedures are performed according to requirements and/or established procedures.</p> <p>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.</p> <p>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.</p> <p>2.5 Remedial actions are taken to overcome any shortfalls encountered in the work schedule according to requirements and/or established procedures.</p> <p>2.6 Maintenance of oil and gas filled specialized underground <b>cables</b> is carried out, in accordance with the work schedule and requirements and/or established procedures.</p> <p>2.7 Essential knowledge and associated skills in the safe maintenance of oil and gas filled specialized underground cables is applied to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.8 Solutions to non-routine problems are identified and implemented using acquired essential knowledge and associated skills according to requirements.</p> <p>2.9 Ongoing checks of quality of the work are undertaken in accordance with requirements and established standard procedures.</p>
<p>3. Complete maintenance of oil and gas filled</p>	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures.</p>

specialized underground cables	<p>3.2 Accidents and/or injuries are reported and followed up in accordance with requirements/established procedures.</p> <p>3.3 Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures.</p> <p>3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.5 Relevant work permit(s) are signed off and, underground cables are returned to service and advised to client/customer in accordance with requirements.</p> <p>3.6 Works completion records, reports, as installed /modified drawing(s) and/or documentation and information are confirmed, processed and appropriate personnel notified.</p>
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Variable	Range
This unit may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>• the maintenance and repair of oil and gas filled specialized underground cables</li> </ul>
Cable type includes:	<ul style="list-style-type: none"> <li>• Pressurized oil filled and gas filled cables 33kV and above.</li> <li>• Testing and recording equipment may include:               <ul style="list-style-type: none"> <li>• voltage detectors,</li> <li>• cable identification equipment,</li> <li>• insulation resistance testers</li> </ul> </li> </ul>
Jointing and terminating materials:	<ul style="list-style-type: none"> <li>• compound and resin filled boxes</li> <li>• paper tape/roll materials</li> <li>• polymeric tape materials</li> <li>• heat shrink materials</li> <li>• “slip on” molded components</li> <li>• molten solders and gas/oil piping and fittings</li> <li>• compression, mechanical, solder lugs and ferrules and welded connections</li> <li>• This unit also encompasses the preparation for cable freezing and preliminary pressure control and leak repair activities.</li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> </ul>

	<ul style="list-style-type: none"> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards and Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Authorization and Notification</li> <li>• OHS practices and OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Maintaining oil and gas filled specialized underground cables</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Maintaining oil and gas filled specialized underground cables</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV	
Unit Title	Install and Maintain Polymeric Specialized Underground Cables
Unit Code	<a href="#">EIS DNI4 07 0612</a>
Unit Descriptor	This unit covers the installation, maintenance and repair of polymeric specialized underground cables including XLPE and EPR above 33kV. It includes jointing and terminating, as well as working under induced voltages and undertaking the relevant tests required for jointing. It also encompasses the preparation of the cable jointing bay, the preparation of cables and phasing out, cable identification and spiking, the treatment/handling of, but not jointing fiber optical cables.

Elements	Performance Criteria
1. Prepare/Plan to install and maintain polymeric specialized underground cables	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and <b>material</b> lists, are obtained, analyzed , if necessary, by site inspection and the extent of the preparation of the work determined for planning and coordination.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>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.</p> <p>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.</p> <p>1.5 Risk control measures are identified, prioritized and evaluated against the work schedule.</p> <p>1.6 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.</p> <p>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.</p>
2. Carry out installation and maintenance	<p>2.1 OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimize waste are monitored and implemented in accordance with requirements and/or established procedures.</p>

of polymeric specialized underground cables	<p>2.2 First aid, rescue and other related work procedures are performed according to requirements and/or established procedures.</p> <p>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.</p> <p>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.</p> <p>2.5 Remedial actions are taken to overcome any shortfalls encountered in the work schedule according to requirements and/or established procedures.</p>
3. Complete the installation and maintenance of polymeric specialized underground cables	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures.</p> <p>3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures.</p> <p>3.3 Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures.</p> <p>3.4 Tools, <b>equipment</b> and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.5 Relevant work permit(s) are signed off and, underground cables are returned to service and advised to client/customer in accordance with requirements.</p> <p>3.6 Works completion records, reports, as installed /modified drawing(s) and/or documentation and information are confirmed, processed and appropriate personnel notified.</p>

Variable	Range
This unit shall/may be demonstrated in relation to:	<p>Polymeric specialized underground cables including XLPE and EPR above 33kV, and covers:</p> <ul style="list-style-type: none"> <li>• the installation,</li> <li>• jointing, terminating,</li> <li>• repair and replacement of cables used in systems and circuits and</li> <li>• the issuing/accepting of relevant permits.</li> </ul> <p>It also encompasses:</p> <ul style="list-style-type: none"> <li>• preparation of the cable jointing bay,</li> <li>• preparation of cables and phasing out,</li> </ul>

	<ul style="list-style-type: none"> <li>• treatment/handling, but not jointing of fiber optical cables</li> </ul> <p>Also cable identification and spiking are included.</p>
Test and recording equipment includes:	<ul style="list-style-type: none"> <li>• voltage detectors,</li> <li>• cable identification equipment,</li> <li>• cable spiking equipment and</li> <li>• insulation resistance testers</li> </ul>
Jointing and terminating materials include:	<ul style="list-style-type: none"> <li>• compound and resin filled boxes,</li> <li>• polymeric tape materials,</li> <li>• polymeric heat shrink materials,</li> <li>• "slip-on" molded components and pre-stretched polymeric materials,</li> <li>• welded,</li> <li>• compression and</li> <li>• Mechanical connectors.</li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices and OHS issues</li> <li>• Permits and/or permits to work</li> <li>• personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>



<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Underground cable installation</li> <li>• Underground cable construction</li> <li>• Polymeric specialized underground cables</li> <li>• principles</li> <li>• Jointing and terminating specialized polymeric underground cables</li> <li>• Installing and maintaining specialized polymeric underground cables</li> <li>• Enterprises specific - policies and procedure</li> <li>• instructions</li> <li>• Enterprises specific - OHS instructions</li> <li>• Enterprises specific - technical drawing and documents</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• safe working practices and applying OHS practices</li> <li>• Underground cable installation</li> <li>• Underground cable construction</li> <li>• Polymeric specialized underground cables practices</li> <li>• Jointing and terminating specialized polymeric underground cables</li> <li>• Installing and maintaining specialized polymeric underground ca</li> <li>• Enterprises specific - policies and procedure instructions</li> <li>• Enterprises specific - OHS instructions</li> <li>• Enterprises specific - technical drawing and documents</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Install and Maintain Oil and Gas Pressure System for Specialized Underground Cables</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 08 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the installation, maintenance and repair of oil and gas pressure systems for specialized underground cables. It includes the undertaking of pressure control activities, the installation of gauges, oil tanks and gas cubicles. It also includes the knowledge of oil route profiles as well as the operation of pressure equipment for jointing works, and the repairing and replacing of pressure systems. It also encompasses the procedures associated with performing, accessory impregnation, oil flow testing, the processes for oil degasification and performing leak location of pressure systems.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare/Plan to install and maintain oil and gas pressure systems for specialized underground cables	<p>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.</p> <p>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.</p> <p>1.3 Risk control measures are identified, prioritized and evaluated against the work schedule.</p> <p>1.4 Relevant requirements and established procedures for the work are to all personnel and identified for all work sites.</p> <p>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.</p> <p>1.6 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.</p> <p>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.</p> <p>1.8 Clients/Customers are provided with possible solutions</p>

	<p>and/or options within the scope, acceptable cost and requirements.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work.</p> <p>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.</p> <p>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.</p> <p>1.12 Positioning of road signs, barriers and warning devices is planned and coordinated in accordance with requirements.</p>		
<p>2. Carry out installation and maintenance of oil and gas pressure systems for specialized underground cables</p>	<p>2.1 OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimize waste are monitored and implemented in accordance with requirements and/or established procedures.</p> <p>2.2 First Aid, Rescue and other related work procedures are performed according to requirements and/or established procedures.</p> <p>2.3 Lifting, climbing, working in confined spaces and aloft, and use of power <b>tools/equipment</b>, techniques and practices are safely exercised according to requirements.</p> <p>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.</p> <p>2.5 Remedial actions are taken to overcome any shortfalls encountered in the work schedule according to requirements and/or established procedures.</p> <p>2.6 Installation and/or maintenance of <b>oil and gas</b> pressure systems for specialized underground cables is carried out, in accordance with the work schedule and requirements and/or established procedures.</p> <p>2.7 Essential knowledge and associated skills in the safe installation and/or maintenance of oil and gas pressure systems for specialized underground cables is applied to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.8 Solutions to non-routine problems are identified and implemented using acquired essential knowledge and</p>		
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	<p>associated skills according to requirements.</p> <p>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.</p>
3. Complete the installation and maintenance of oil and gas pressure systems for specialized underground cables	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures.</p> <p>3.2 Accidents and/or injuries are reported and followed up in accordance with requirements/established procedures.</p> <p>3.3 Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures.</p> <p>3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.5 Relevant work permit(s) are signed off and, <b>underground cables</b> are returned to service and advised to client/customer in accordance with requirements.</p>

Variable	Range
Installation and maintenance of oil and gas pressure systems for specialized underground cables.	<ul style="list-style-type: none"> <li>• It covers the installation of pressure control cubicles, pressure lines, oil and gas tanks/cylinders and flow control equipment</li> <li>• Maintenance of pressure systems including routine maintenance activities and equipment testing.</li> <li>• Leak location activities including cable freezing and flow rate comparison tests.</li> <li>• It also encompasses the processing of cable oil and basic testing and sampling of oil.</li> </ul>
Oil processing and control equipment	<p>May include:</p> <ul style="list-style-type: none"> <li>• oil de-gasification units</li> <li>• oil trays and pumps</li> <li>• vacuum pumps</li> <li>• accessory impregnation equipment</li> <li>• RGP meters and equipment</li> <li>• manometers, vacuum meters</li> <li>• flow boards</li> <li>• oil sampling flasks and extraction plant</li> <li>• liquid nitrogen cylinders and associated cable freezing equipment</li> <li>• oil pressure tanks</li> <li>• oil piping</li> </ul>

	<ul style="list-style-type: none"> <li>• fittings and valves</li> <li>• oil control cubicles</li> </ul>
Gas processing and control equipment	<p>May include:</p> <ul style="list-style-type: none"> <li>• Dry nitrogen cylinders,</li> <li>• gas piping, fittings and valves,</li> <li>• pressure meters and transducers,</li> <li>• gas control cubicles</li> </ul>
The following constants and variables included in the Range Statement of this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification.</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>

### Evidence Guide

Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation,</li> </ul>
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	regulations, polices and workplace procedures
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: <ul style="list-style-type: none"> <li>• Underground cable installation</li> <li>• Underground cable construction</li> </ul>
	<ul style="list-style-type: none"> <li>• Jointing and terminating oil and gas filled specialized cable</li> <li>• Installing oil and gas filled specialized underground cables</li> <li>• Maintaining oil and gas filled specialized underground cables</li> <li>• Install and maintain oil and gas Pressurized systems</li> <li>• Oil and gas filled specialized underground cable principles</li> <li>• Enterprises specific - policies and procedure instructions</li> <li>• Enterprises specific - OHS instructions</li> <li>• Enterprises specific - technical drawing and documents</li> </ul>
Underpinning Skills	Demonstrates skills to: <ul style="list-style-type: none"> <li>• safe working practices and applying ohs practices</li> <li>• underground cable installation</li> <li>• underground cable construction</li> <li>• jointing and terminating oil and gas filled specialized cable</li> <li>• installing oil and gas filled specialized underground cables</li> <li>• maintaining oil and gas filled specialized underground cables</li> <li>• install and maintain oil and gas pressurized systems</li> </ul>
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: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Maintain Energized Medium Voltage Distribution Overhead Electrical Apparatus (Operating Rod and Glove)</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 09 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the maintenance of energized Medium Voltage distribution overhead electrical apparatus using Medium Voltage live line glove and barrier method 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 working documents.

<b>Elements</b>	<b>Performance Criteria</b>
1. Plan to maintain energized high voltage distribution overhead electrical apparatus (glove and barrier)	<p>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.</p> <p>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.</p> <p>1.3 Risk control measures are identified, prioritized and evaluated against the work schedule.</p> <p>1.4 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>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.</p> <p>1.6 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.</p> <p>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.</p>

	<p>1.8 Clients/Customers are provided with possible solutions and/or options within the scope, acceptable cost and requirements.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work.</p> <p>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.</p> <p>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.</p> <p>1.12 Positioning of road signs, barriers and warning devices is planned and coordinated in accordance with requirements.</p>		
<p>2. Carry out maintenance of energized Medium Voltage distribution overhead electrical apparatus (glove and barrier)</p>	<p>2.1 OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimize waste are monitored and implemented in accordance with requirements and/or established procedures.</p> <p>2.2 First Aid, Rescue and other related work procedures are performed according to requirements and/or established procedures.</p> <p>2.3 Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely exercised according to requirements and including the use of Medium Voltage live line sticks.</p> <p>2.4 Auto-reclose devices associated with the circuits being worked on have been rendered inoperative and necessary work documentation acquired in accordance with enterprise requirements.</p> <p>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.</p> <p>2.6 Remedial actions are taken to overcome any shortfalls encountered in the work schedule according to requirements and/or established procedures.</p> <p>2.7 <b>Maintenance</b> of energized medium voltage distribution overhead electrical apparatus is carried out, in accordance with the work schedule and requirements and/or established procedures.</p> <p>2.8 Essential knowledge and associated skills in the safe maintenance of energized Medium Voltage distribution</p>		
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	<p>overhead electrical apparatus is applied to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.9 Solutions to non-routine problems are identified and implemented using acquired essential knowledge and associated skills according to requirements.</p> <p>2.10 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.</p>
3. Complete the maintenance of energized high voltage distribution overhead electrical apparatus (glove and barrier)	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures.</p> <p>3.2 Accidents and/or injuries are reported and followed up in accordance with requirements/established procedures.</p> <p>3.3 Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures.</p> <p>3.4 Tools, <b>equipment</b> and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.5 Relevant work permit(s) are signed off and, energized Medium Voltage apparatus is returned to service and advised to client/customer in accordance with requirements.</p> <p>3.6 <b>Works</b> completion records, reports, as installed /modified drawing(s) and/or documentation and information are confirmed, processed and appropriate personnel notified.</p>

Variable	Range
This unit may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>the maintenance of energized MV distribution overhead electrical apparatus</li> </ul>
Types of conductor may include:	<ul style="list-style-type: none"> <li>bare aluminum;</li> <li>steel cored aluminum,</li> <li>steel and copper conductors and</li> <li>insulated unscreened conductor (IUC) systems</li> </ul>
Appropriate work platform Maintenance work	<p>May include :</p> <ul style="list-style-type: none"> <li>the replacement and repair or installation of structures, associated hardware and conductors, and the installation, repair, replacement or connection of bridges/bonding connections.</li> </ul>

	<ul style="list-style-type: none"> <li>• the repair/replacement/installation of electrical equipment and associated components whose current carrying parts are exposed, e.g. air break switches, Medium Voltage links or disconnects and expulsion drop-out fuses.</li> <li>• Pole mounted re closers, transformers, sectionalizes, lightning arresters and medium voltage cables</li> <li>• The commissioning of medium voltage electrical apparatus Distribution structures may be wood, steel, concrete or composite</li> <li>• Conductor voltage will not exceed 33kV</li> <li>• Work may be performed from elevating work platform, ladder, portable pole platform or insulated scaffold and may include the use of a gin pole</li> </ul>		
<p>Testing and recording equipment includes:</p>	<ul style="list-style-type: none"> <li>• phasing sticks,</li> <li>• fault indicators,</li> <li>• voltage detectors,</li> <li>• leakage detectors insulation testers and</li> <li>• test equipment for live-line tools</li> </ul>		
<p>The following constants and variables included in the Range Statement of this unit:</p>	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices and OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>		
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, policies and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Live line working up to 33kV with glove and barrier</li> <li>• Working on live lines to 33kV with glove and barrier/ hotstick combined</li> <li>• Plant, equipment and tools used for MV live line work</li> <li>• MV principles</li> <li>• Power line safety practices</li> <li>• Medium Voltage switching principles</li> <li>• Medium Voltage fault switching principles</li> <li>• Medium Voltage distribution transformer principles</li> <li>• Medium Voltage SWER system</li> <li>• Feeder automation system.</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• safe working practices and applying OHS practices</li> <li>• live line working up to 33kV with glove and barrier</li> <li>• working on live lines to 33kV with glove and barrier/hotstick combined</li> <li>• plant, equipment and tools used for MV live line work</li> <li>• power line safety practices</li> <li>• medium voltage distribution transformer</li> <li>• medium voltage SWER system</li> <li>• feeder automation system</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration/ with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>

Occupational Standard: Power Distribution Network Infrastructure/ System Installation and Maintenance Level IV	
Unit Title	Design Customer Substations
Unit Code	<a href="#">EIS DNI4 10 0612</a>
Unit Descriptor	This competence standard unit covers the design of basic primary and secondary plant within a customer substation. Such designs will usually include relay-operated MV switchgear, distribution transformers LV switchgear, including customer distribution boards. The design may include minor civil engineering aspects and must conform to relevant standards, safety regulations, environmental standards and customer requirements taking into account costs as an important criterion.

Elements	Performance Criteria
1. Plan and coordinate for the design of customer substations	<p>1.1 OHS practices/procedures and Environmental and sustainable energy procedures, which may influence the design of <b>customer substations</b>, are reviewed and determined.</p> <p>1.2 Purpose of the design is established and expected outcomes of the work are confirmed with the appropriate personnel.</p> <p>1.3 Organizational established procedures on policies and specifications for the design are obtained or established with the appropriate personnel.</p> <p>1.4 Equipment/tools and personal protective equipment are selected and coordinated based on specified requirements and established procedures</p> <p>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</p> <p>1.6 Risk control measures are identified, prioritized and evaluated against the work schedule</p> <p>1.7 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures</p> <p>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</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land-owners are resolved and activities coordinated to carry out work</p>

	<p>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</p>
<p>2. Carry out and coordinate the design of customer substations</p>	<p>2.1 Circuit/system modeling is used to evaluate alternative proposals as per established procedures.</p> <p>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</p> <p>2.3 Substation design decisions are made on the basis of safety and effective outcomes according to requirements and/or established procedures</p> <p>2.4 Mathematical models of the customer substation are used to analyze the effectiveness of the finished project as per requirements and established procedures</p> <p>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</p> <p>2.6 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.</p> <p>2.7 Solutions to non-routine problems are identified and implemented using acquired essential knowledge and associated skills according to requirements</p> <p>2.8 Quality of work is monitored against personal performance agreement and/or established organizational and professional standards.</p>
<p>3. Complete and coordinate the design of customer substations</p>	<p>3.1 Final inspections of the design are undertaken to ensure they comply with all requirements and include all specifications and documentations needed to complete the design brief.</p> <p>3.2 Appropriate personnel are notified of completion and reports and/or completion documents are finalized .</p> <p>3.3 Reports and/or completion documents are submitted to relevant personnel/organizations for approval and, where applicable, statutory or regulatory approval</p> <p>3.4 Approved copies of design documents are issued and records updated according to established procedures.</p>

Variable	Range
This unit shall/may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>• the design of customer substations,</li> <li>• transformers,</li> <li>• MV switchgear,</li> <li>• LV switchgear,</li> <li>• relevant protection systems,</li> <li>• (fuses and circuit breakers),</li> <li>• civil works,</li> <li>• customer distribution boards</li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform.</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration.</li> <li>• Documenting detail work events, record keeping and or storage of information.</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy Procedures</li> <li>• Environmental legislation.</li> <li>• Environmental management documentation.</li> <li>• Established procedures.</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification.</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and / or permits to work</li> <li>• Personnel.</li> <li>• Quality assurance systems.</li> <li>• Requirements.</li> <li>• Safe design principles</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>

<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Occupational Health and Safety principles</li> <li>• Electrical safe working practice</li> <li>• Occupational health and safety principles -enterprise responsibilities</li> <li>• Generation power systems</li> <li>• Substations, power transformers and reactors.</li> <li>• Metering installations.</li> <li>• Safe design principles</li> <li>• Switchgear installation</li> <li>• Medium Voltage distribution transformer principles</li> <li>• Feeder automation system</li> <li>• Distribution substation minor upgrade layout principles</li> <li>• Distribution transformer fundamentals</li> <li>• Distribution transformer operation</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• safe working practices and applying OHS practice</li> <li>• Electrical safe working practice</li> <li>• Occupational health and safety principles -enterprise responsibilities</li> <li>• Generation power systems</li> <li>• Substations, power transformers and reactors.</li> <li>• Metering installations.</li> <li>• Switchgear installation</li> <li>• Feeder automation system</li> <li>• Distribution transformer fundamentals</li> <li>• Distribution transformer operation</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Draft and Layout an Overhead and Ground Distribution Extension</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 11 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the planning and layout of one or two pole minor overhead distribution 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.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare/plan to draft and layout an overhead distribution extension	<p>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.</p> <p>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.</p> <p>1.3 Risk control measures are identified, prioritized and evaluated against the work schedule.</p> <p>1.4 Relevant requirements and established procedures for the work are to all personnel and identified for all work sites.</p> <p>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.</p> <p>1.6 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.</p> <p>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.</p> <p>1.8 Clients/Customers are provided with possible solutions and /or options within the scope, acceptable cost and requirements.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are</p>



	<p>resolved and activities coordinated to carry out work.</p> <p>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.</p> <p>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.</p> <p>1.12 Positioning of road signs, barriers and warning devices is planned in accordance with requirements.</p>
<p>2. Carry out drafting and layout of an overhead distribution extension</p>	<p>2.1 OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimize waste are monitored and implemented in accordance with requirements and/or established procedures.</p> <p>2.2 First Aid, Pole Top Rescue and other related work procedures are performed according to requirements and/or established procedures.</p> <p>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.</p> <p>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.</p> <p>2.5 Remedial actions are taken to overcome any shortfalls encountered in the work schedule according to requirements and/or established procedures.</p> <p>2.6 The drafting and layout of an overhead distribution extension is carried out, in accordance with the work schedule and requirements and/or established procedures.</p> <p>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.</p> <p>2.8 Solutions to non-routine problems are identified and implemented using acquired essential knowledge and associated skills according to requirements.</p> <p>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</p>

<p>3. Complete drafting and layout of an overhead distribution extension</p>	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures.</p> <p>3.2 Accidents and/or injuries are reported and followed up in accordance with requirements/established procedures.</p> <p>3.3 Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures.</p> <p>3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>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.</p> <p>3.6 Works completion records, reports, as installed /modified drawing(s) and/or documentation and information are confirmed, processed and appropriate personnel notified.</p>
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Variable	Range
<p>This unit shall/may be demonstrated in relation to:</p>	<ul style="list-style-type: none"> <li>• undertaking a draft and layout of an overhead distribution extension pole, including wood, concrete, steel and composite),</li> <li>• associated hardware,</li> <li>• Including conductors (bare wire and aerial bundle cable),</li> <li>• Cross arms, insulators</li> <li>• ACR</li> <li>• regulator</li> <li>• earthen</li> <li>• air break switches, gas switches,</li> <li>• capacitor units and transformers</li> <li>• links and fuses</li> <li>• sectionalizes</li> <li>• lead arrestors</li> <li>• MV switchgear and LV switchgear</li> <li>• control boxes</li> <li>• communications equipment</li> <li>• lanterns and signage</li> <li>• supervisory cable and cable TV</li> <li>• substations,</li> <li>• relevant protection systems and associated civil works</li> </ul>
<p>The following constants and variables included in this unit:</p>	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> </ul>

	<ul style="list-style-type: none"> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Safe design principles</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
<b>Critical Aspects of Competence</b>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
<b>Underpinning Knowledge and Attitudes</b>	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Power line distribution installation</li> <li>• Power line installation safety</li> <li>• Pole and hardware installation</li> <li>• Distribution overhead line component fundamentals</li> <li>• Enterprise specific – switching diagrams</li> <li>• Interpretation of power distribution network drawings and documentation</li> <li>• Overhead distribution extension layout principles</li> </ul>

	<ul style="list-style-type: none"> <li>• Surveying techniques</li> <li>• Introduction to computer software (Power line ) and CAD</li> </ul>
Underpinning Skill	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• safe working practices and applying OHS practices</li> <li>• Power line distribution installation</li> <li>• Power line installation safety</li> <li>• Pole and hardware installation</li> <li>• Distribution overhead line component fundamentals</li> <li>• Enterprise specific – switching diagrams</li> <li>• Interpretation of power distribution network drawings and documentation</li> <li>• Overhead distribution extension</li> <li>• Surveying techniques</li> </ul>
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	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Draft and Layout a Street Lighting System</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 12 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the planning and layout of street lighting systems. It includes the conduction of site inspections to confirm and or modify a street lighting system layout, estimation of costs and resources for the works order and the pegging out of the poles/underground cables according to the work order and to optimize visibility and minimize traffic hazards. It also encompasses the provision of advice on conditions of supply and permits and the communication and coordination needed to be undertaken with the relevant authorities and clients.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare/plan to draft and layout a street lighting system	<p>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.</p> <p>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.</p> <p>1.3 Risk control measures are identified, prioritized and evaluated against the work schedule.</p> <p>1.4 Relevant requirements and established procedures for the work are to all personnel and identified for all work sites.</p> <p>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.</p> <p>1.6 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.</p> <p>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.</p> <p>1.8 Clients/Customers are provided with possible solutions and/or options within the scope, acceptable cost and requirements.</p>

	<p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work.</p> <p>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.</p> <p>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.</p> <p>1.12 Positioning of road signs, barriers and warning devices is planned in accordance with requirements.</p>
<p>2. Carry out the drafting and layout of a street lighting system</p>	<p>2.1 OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimize waste are monitored and implemented in accordance with requirements and/or established procedures.</p> <p>2.2 First aid, pole top rescue and other related work procedures are performed according to requirements and/or established procedures.</p> <p>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.</p> <p>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.</p> <p>2.5 Remedial actions are taken to overcome any shortfalls encountered in the work schedule according to requirements and/or established procedures.</p> <p>2.6 The drafting and layout of a street lighting system are carried out, in accordance with the work schedule and requirements and/or established procedures.</p> <p>2.7 Essential knowledge and associated skills in the safe drafting and layout of a street lighting system is applied to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.8 Solutions to non-routine problems are identified and implemented using acquired essential knowledge and associated skills according to requirements.</p>
<p>3. Complete drafting and layout of street lighting system</p>	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures.</p>

	<p>3.2 Accidents and/or injuries are reported and followed up in accordance with requirements/established procedures.</p> <p>3.3 Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures.</p> <p>3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.5 Relevant work permit(s) are signed off and are returned to service and advised to client/customer in accordance with requirements.</p> <p>3.6 Works completion records, reports, as installed /modified drawing(s) and/or documentation and information are confirmed, processed and appropriate personnel notified.</p>
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Variable	Range
This unit shall/may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>• the draft and layout of a street lighting systems pole (including wood, concrete, steel and composite) associated hardware including: <ul style="list-style-type: none"> <li>• conductors (underground, bare wire and aerial bundle cable)</li> <li>• LV Switchgear</li> <li>• lanterns</li> <li>• lamps</li> <li>• brackets</li> <li>• signage</li> <li>• supervisory cable</li> <li>• cable TV</li> <li>• Substations</li> </ul> </li> <li>• relevant protection systems and associated civil works.</li> </ul>
The following constants and variables included in the Range Statement of this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> </ul>

	<ul style="list-style-type: none"> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification.</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Safe design principles</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Power line distribution installation</li> <li>• Power line installation safety</li> <li>• Pole and hardware installation</li> <li>• Installation and maintenance of public lighting and associated equipment</li> <li>• Distribution overhead line component Fundamentals</li> <li>• Enterprise specific – switching diagrams</li> <li>• Interpretation of power distribution network drawings and documentation</li> <li>• Overhead distribution extension layout principles</li> <li>• Surveying Techniques</li> <li>• Introduction to Computer Software (Power line ) and</li> <li>• CAD</li> <li>• Principles of lighting design</li> <li>• Principles in drafting street lighting system</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Power line distribution installation</li> <li>• Power line installation safety</li> <li>• Pole and hardware installation</li> <li>• Installation and maintenance of public lighting and associated equipment</li> </ul>



	<ul style="list-style-type: none"> <li>• Distribution overhead line component Fundamentals</li> <li>• Enterprise specific – switching diagrams</li> <li>• Interpretation of power distribution network drawings and documentation</li> <li>• Overhead distribution extension layout principles</li> <li>• Surveying Techniques</li> <li>• Introduction to Computer Software (Power line) and CAD</li> <li>• Principles of lighting design</li> <li>• Principles in drafting street lighting system</li> </ul>
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: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Draft and Layout Distribution Substation Minor Upgrade</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 13 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the drafting and laying out of minor LV distribution upgrades, including the estimating of the costs and/or resources for the work to be undertaken. It also encompasses on-the-job design, surveying techniques, the pegging and or marking out of the trench position, the pit/pillar position and the cable position according to the work order and enterprise requirements.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare/plan to draft and layout a distribution substation upgrade	<p>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.</p> <p>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.</p> <p>1.3 Risk control measures are identified, prioritized and evaluated against the work schedule.</p> <p>1.4 Relevant requirements and established procedures for the work are to all personnel and identified for all work sites.</p> <p>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.</p> <p>1.6 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.</p> <p>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.</p> <p>1.8 Clients/Customers are provided with possible solutions and/or options within the scope, acceptable cost and requirements.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are</p>

	<p>resolved and activities coordinated to carry out work.</p> <p>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.</p> <p>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.</p> <p>1.12 Positioning of road signs, barriers and warning devices is planned in accordance with requirements.</p>
<p>2. Carry out the drafting and layout of a distribution substation upgrade</p>	<p>2.1 OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimize waste are monitored and implemented in accordance with requirements and/or established procedures.</p> <p>2.2 First aid, pole top rescue and other related work procedures are performed according to requirements and/or established procedures.</p> <p>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.</p> <p>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.</p> <p>2.5 Remedial actions are taken to overcome any shortfalls encountered in the work schedule according to requirements and/or established procedures.</p> <p>2.6 Drafting and layout of a distribution substation upgrade is carried out, in accordance with the work schedule and requirements and/or established procedures.</p> <p>2.7 Essential knowledge and associated skills in the safe drafting and layout of a distribution substation upgrade is applied to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.8 Solutions to non-routine problems are identified and implemented using acquired essential knowledge and associated skills according to requirements.</p> <p>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.</p>

<p>3. Complete the drafting and layout of a distribution substation upgrade</p>	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures.</p> <p>3.2 Accidents and/or injuries are reported and followed up in accordance with requirements/established procedures.</p> <p>3.3 Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures.</p> <p>3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.5 Relevant work permit(s) are signed off and, substation equipment, apparatus, wiring and instrumentation are returned to service and advised to client/customer in accordance with requirements.</p> <p>3.6 Works completion records, reports, as installed /modified drawing(s) and/or documentation and information are confirmed, processed and appropriate personnel notified.</p>
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Variable	Range
<p>This unit shall/may be demonstrated in relation to:</p>	<ul style="list-style-type: none"> <li>• the draft and layout of a minor distribution substation upgrade transformers,</li> <li>• cables,</li> <li>• Surge Div,</li> <li>• MV Switchgear,</li> <li>• LV Switchgear,</li> <li>• links,</li> <li>• relays,</li> <li>• power supply,</li> <li>• signage,</li> <li>• Bus bars,</li> <li>• relevant protection systems including fuses and circuit breakers and associated civil works</li> </ul>
<p>The following constants and variables included in this unit:</p>	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> </ul>

	<ul style="list-style-type: none"> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Safe design principles</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Power line distribution installation</li> <li>• Power line installation safety</li> <li>• Underground cable installation</li> <li>• Underground cable construction</li> <li>• Enterprise specific – switching diagrams</li> <li>• Interpretation of power distribution network drawings and documentation</li> <li>• Surveying techniques</li> <li>• Introduction to computer software (Power line ) and CAD</li> <li>• Underground mains layout principles</li> <li>• Distribution substation minor upgrade layout principles</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Power line distribution installation</li> <li>• Power line installation safety</li> <li>• Underground cable installation</li> <li>• Underground cable construction</li> </ul>

	<ul style="list-style-type: none"> <li>• Enterprise specific – switching diagrams</li> <li>• Introduction to computer software (Power line ) and CAD</li> <li>• Underground mains layout practices</li> <li>• Distribution substation minor upgrade layout practices</li> </ul>
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: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Develop LV Switching Schedule and Program</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 14 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the preparation of a basic switching schedule for LV network. 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 design parameters.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare/plan to develop LV switching schedules	<p>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.</p> <p>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.</p> <p>1.3 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>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.</p> <p>1.5 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.</p> <p>1.6 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</p> <p>1.7 Clients/Customers are provided with possible solutions and/or options within the scope, acceptable cost and requirements.</p> <p>1.8 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.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work.</p>

<p>2. Carry out the development of LV switching schedules</p>	<p>2.1 OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimize waste are monitored and implemented in accordance with requirements and/or established procedures.</p> <p>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.</p> <p>2.3 Remedial actions are taken to overcome any shortfalls encountered in the work schedule according to requirements and/or established procedures.</p> <p>2.4 <b>Development of LV switching schedules</b> is carried out, in accordance with the work schedule and requirements and/or established procedures.</p> <p>2.5 Essential knowledge and associated skills in the safe development of LV switching schedules is applied to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.6 Solutions to non-routine problems are identified and implemented using acquired essential knowledge and associated skills according to requirements.</p> <p>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.</p>
<p>3. Complete development of LV switching schedules</p>	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures.</p> <p>3.2 Relevant work permit(s) are signed off and, plant is returned to service and advised to client/customer in accordance with requirements.</p> <p>3.3 Accidents and/or injuries are reported and followed up in accordance with requirements/established procedures.</p> <p>3.4 Works completion records, reports, as installed /modified drawing(s) and/or documentation and information are confirmed, processed and appropriate personnel notified.</p>

Variable	Range
This unit may be demonstrated in relation to the	May include: <ul style="list-style-type: none"> <li>• system diagram,</li> <li>• system plant data and</li> </ul>



development of a LV switching schedule	<ul style="list-style-type: none"> <li>• loading evaluation of network components</li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>

<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Electrical equipment - MV and LV Power line</li> <li>• Power line safety practices</li> <li>• Switchgear installation</li> <li>• Low voltage switching principles</li> <li>• System switching operations and authorization procedures - LV</li> <li>• Low voltage overhead and substation switching principles</li> <li>• Low voltage switching instruction preparation</li> </ul>

	<ul style="list-style-type: none"> <li>• Enterprises specific - polices and procedure Instructions</li> <li>• Enterprises specific - OHS instructions</li> <li>• Enterprises specific - technical drawing and documents</li> <li>• Enterprise specific - specialized tools</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Electrical equipment - MV and LV Power line</li> <li>• Power line safety practices</li> <li>• Switchgear installation</li> <li>• Low voltage switching principles</li> <li>• System switching operations and authorization procedures - LV</li> <li>• Low voltage overhead and substation switching principles</li> <li>• Low voltage switching instruction preparation</li> <li>• Enterprises specific - polices and procedure Instructions</li> <li>• Enterprises specific - OHS instructions</li> <li>• Enterprises specific - technical drawing and documents</li> <li>• Enterprise specific - specialized tools</li> </ul>
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	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Contribute to Coordinated MV Live Line Work</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 15 0612</u></a>
<b>Unit Descriptor</b>	<p>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 Medium Voltage (MV) live line work.</p> <p>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.</p>

<b>Elements</b>	<b>Performance Criteria</b>
1. Plan to contribute to a coordinated Medium Voltage Live Line work team.	<p>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.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all team members and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the working on MV live lines are obtained and confirmed for the purposes of the work to be performed and discussed among all team members.</p> <p>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.</p> <p>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.</p> <p>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 established procedures.</p> <p>1.7 Resources including personnel, equipment, tools and</p>

	<p>personal protective equipment required for the job are identified, scheduled and coordinated and confirmed in a safe and technical working order.</p> <p>1.8 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.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work.</p> <p>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.</p> <p>1.11 All team members to be engaged in the work discuss and agree, without ambiguity, on their respective roles, and possible role changes during the course of work.</p> <p>1.12 Positioning of road signs, barriers and warning devices is planned and coordinated in accordance with requirements.</p>		
<p>2. Carry out the contribution to coordinated Medium Voltage Live Line work.</p>	<p>2.1 OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimize waste are monitored and implemented in accordance with requirements and/or established procedures. In particular, established live line working procedures are strictly adhered to.</p> <p>2.2 First Aid, rescue and other related work procedures are performed according to requirements and/or established procedures</p> <p>2.3 Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices, where applicable are safely exercised according to requirements.</p> <p>2.4 Live line permits and other provisions for live line work are in place as required, in accordance with the requirements and established procedures.</p> <p>2.5 Essential knowledge and associated skills in the safe <b>contribution to coordinated Medium Voltage Live Line work</b> is applied to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.6 Work is undertaken on MV Live Line in a team environment work according to the work schedule and requirements/ established procedures.</p> <p>2.7 Work is shared among all team members in a</p>		
<p>Page 235 of 316</p>	<p>Ministry of Education Copyright</p>	<p>Power Distribution Network Infrastructure/System Installation and Maintenance Ethiopian Occupational Standard</p>	<p>Version 1 June 2012</p>

	<p>coordinated manner as discussed and agreed during pre-work briefing.</p> <p>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.</p> <p>2.9 Unplanned events in the maintenance of MV Live Line work are discussed among all team members and appropriate action undertaken accordingly.</p> <p>2.10 Solutions to non-routine problems are identified and implemented using acquired essential knowledge and associated skills according to requirements.</p> <p>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.</p>
3. Complete the contribution to coordinated Medium Voltage Live Line work.	<p>3.1 Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures.</p> <p>3.2 Accidents and/or injuries are reported and followed up in accordance with requirements/established procedures.</p> <p>3.3 Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures.</p> <p>3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.5 Relevant work permit(s) are signed off and, Medium Voltage Live Line work is returned to service and advised to client/customer in accordance with requirements.</p> <p>3.6 Works completion records, reports, as installed/modified drawing(s) and/or documentation and information are confirmed, processed and appropriate personnel notified.</p> <p>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.</p>

Variable	Range
This unit shall/may be demonstrated	<ul style="list-style-type: none"> <li>• hot stick</li> <li>• gloves and barrier, or bare hand technical details utilizing</li> </ul>

<p>in relation to contributing to coordinated medium voltage live line work. This is a common unit for all developed live line working techniques such as:</p>	<p>these live line techniques are covered in other respective units of competence for live line work</p> <ul style="list-style-type: none"> <li>• MV live line work may include the maintenance of energized MV electrical apparatus, conductors and cables.</li> </ul> <p>Work may be undertaken:</p> <ul style="list-style-type: none"> <li>• on ladders, insulated elevating work platforms or through the use of a work platform secured to a helicopter</li> </ul> <p>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.</p>
<p>The following constants and variables included in the Range Statement of this unit:</p>	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>

<b>Evidence Guide</b>	
<p>Critical Aspects of Competence</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> </ul>

	<ul style="list-style-type: none"> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Occupational Health and Safety principles</li> <li>• Electrical safe working practice</li> <li>• Power line safety practices</li> <li>• Statutory and safety considerations</li> <li>• Fundamentals for working safely near live electrical apparatus</li> <li>• Enterprise Specific - policy and procedures instructions</li> <li>• Enterprise Specific - OHS Instructions</li> <li>• Enterprise specific - specialized tools</li> <li>• Enterprise Specific - team work Medium Voltage live line</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Electrical safe working practice</li> <li>• Power line safety practices</li> <li>• Statutory and safety considerations</li> <li>• Fundamentals for working safely near live electrical apparatus</li> <li>• Enterprise Specific - policy and procedures instructions</li> <li>• Enterprise Specific - OHS Instructions</li> <li>• Enterprise specific - specialized tools</li> <li>• Enterprise Specific - team work Medium Voltage live line</li> </ul>
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	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Maintain Distribution Field Devices</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 16 0612</u></a>
<b>Unit Descriptor</b>	This unit 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.

<b>Elements</b>	<b>Performance Criteria</b>
1. Plan for the maintenance of distribution field devices	<p>1.1 Work schedules including drawings, plans, requirements procedures and material lists are acquired, analyzed and the extent of work determined.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>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.</p> <p>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.</p> <p>1.5 Risk control measures are identified, prioritized, implemented and evaluated against the work schedule.</p> <p>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.</p> <p>1.7 Liaison issues with other personnel and/or authorities are resolved and activities coordinated to facilitate the work.</p> <p>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.</p> <p>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.</p>
2. Carry out the	2.1 OHS and sustainable energy principles and practices to



<p>maintenance of distribution network field devices</p>	<p>reduce the incidence of accidents and minimize waste are implemented and monitored in accordance with established procedures.</p> <p>2.2 CPR, Rescue from live electrical apparatus and other related safety procedures are in place according to requirements and established procedures.</p> <p>2.3 Safe working documentation is acquired and requirements completed in accordance with established procedures.</p> <p>2.4 Lifting, use of power tools/equipment techniques and practices are safely exercised in accordance with established procedures.</p> <p>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.</p> <p>2.6 Essential knowledge and associated skills for the safe maintenance of distribution field devices is applied to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>2.7 Maintenance, including testing of distribution field devices is undertaken according to requirements and established procedures.</p> <p>2.8 Unplanned events or conditions are responded to in accordance with established procedures.</p>
<p>3. Complete the maintenance of distribution network field devices</p>	<p>3.1 Functional checks of distribution field devices are completed and all work checked against the requirements to ensure compliance.</p> <p>3.2 Anomalies between the work schedule requirements and measured performance are reported and solutions identified in accordance with established procedures.</p> <p>3.3 Safe working documentation is surrendered and transformer made ready for service.</p> <p>3.4 Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures.</p> <p>3.5 Tools, equipment and any surplus resources and materials are cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.6 Approved copies of the maintenance of distribution network field devices documents are issues and records are updated in accordance with established procedures.</p>

Variable	Range
This unit shall/may be demonstrated in relation to the maintenance of distribution field devices:	<ul style="list-style-type: none"> <li>• Automatic circuit re closers (ACRs),</li> <li>• gas switches,</li> <li>• secondary injection tests,</li> <li>• primary injection tests,</li> <li>• TMR radio's, SCADA,</li> <li>• remote control,</li> <li>• over current,</li> <li>• earth fault,</li> <li>• sensitive earth fault,</li> <li>• inverse time curves,</li> <li>• definite time curves,</li> <li>• tripping,</li> <li>• reclose,</li> <li>• DC supplies</li> <li>• AC supplies,</li> <li>• alarms</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: <ul style="list-style-type: none"> <li>• Occupational Health and Safety principles</li> <li>• Electrical safe working practice</li> <li>• Statutory and safety considerations</li> <li>• Electrical equipment - protection and control schemes</li> <li>• Discrete protection schemes - isolation and tagging procedures</li> <li>• Protection devices - maintenance and commission principles</li> <li>• Manufacturers requirements</li> <li>• Disposal procedures for insulating materials</li> </ul>

	<ul style="list-style-type: none"> <li>• Visual inspection procedures - substations</li> <li>• Surge relay operation and maintenance - substations</li> <li>• Analyze and interpret results and measurements - substations</li> <li>• Voltage regulation scheme principles – substations</li> <li>• Use of test equipment on a discrete protection scheme - substations</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Electrical safe working practice</li> <li>• Statutory and safety considerations</li> <li>• Electrical equipment - protection and control schemes</li> <li>• Discrete protection schemes - isolation and tagging procedures</li> <li>• Protection devices - maintenance and commission practices</li> <li>• Manufacturers requirements</li> <li>• Disposal procedures for insulating materials</li> <li>• Visual inspection procedures - substations</li> <li>• Surge relay operation and maintenance - substations</li> <li>• Analyze and interpret results and measurements - substations</li> <li>• Voltage regulation scheme principles – substations</li> <li>• Use of test equipment on a discrete protection scheme - substations</li> </ul>
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	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

<b>Occupational Standard: Power Distribution Network Infrastructure/ System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Commission Distribution Field Devices</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 17 0612</u></a>
<b>Unit Descriptor</b>	This unit 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.

<b>Elements</b>	<b>Performance Criteria</b>
1. Plan for the commissioning of distribution field devices	<p>3.1 Work schedules including drawings, plans, requirements procedures and material lists are acquired, analyzed and the extent of work determined.</p> <p>3.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>3.3 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.</p> <p>3.4 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.</p> <p>3.5 Resources including personnel, equipment, tools and personal protective equipment required for the job are identified, acquired and confirmed in safe/technical working order.</p> <p>3.6 Liaison issues with other personnel and/or authorities are resolved and activities coordinated to facilitate the work.</p> <p>3.7 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.</p> <p>3.8 Work site is prepared according to the work schedule and to minimize risk and damage to property and personnel in accordance with established procedures.</p>
2. Carry out the commissioning	2.1 OHS and sustainable energy principles and practices to reduce the incidence of accidents and minimize waste

<p>of distribution network field devices</p>	<p>are implemented and monitored in accordance with established procedures.</p> <p>2.2 CPR, Rescue from live electrical apparatus and other related safety procedures are in place according to requirements and established procedures.</p> <p>2.3 Safe working documentation is acquired and requirements completed in accordance with established procedures.</p> <p>2.4 Lifting, use of power tools/equipment techniques and practices are safely exercised in accordance with established procedures.</p> <p>2.5 Hazard warnings and safety signs are recognized and hazards and assessed OHS risks are monitored and preventive action taken and/or appropriate authorities consulted where necessary in accordance with established procedures.</p> <p>2.6 Commissioning, including testing of distribution field devices is undertaken according to requirements and established procedures.</p> <p>2.7 Data is analyzed and compared with compliance specifications to ensure completion of the maintenance work is within an agreed timeframe and according to requirements.</p> <p>2.8 Unplanned events or conditions are responded to in accordance with established procedures.</p>
<p>3. Complete the commissioning of distribution network field devices</p>	<p>3.1 Functional checks of distribution field devices are completed and all work checked against the requirements to ensure compliance.</p> <p>3.2 Anomalies between the work schedule requirements and measured performance are reported and solutions identified in accordance with established procedures.</p> <p>3.3 Safe working documentation is surrendered and transformer made ready for service.</p> <p>3.4 Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures.</p> <p>3.5 Tools, equipment and any surplus resources and materials are cleaned, checked and returned to storage in accordance with established procedures.</p> <p>3.6 Documents and records related to the distribution field devices are updated in accordance with established procedures.</p>

Variable	Range
This unit shall/may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>• the commissioning of distribution field devices</li> <li>• Automatic circuit re closers (ACRs)</li> <li>• gas switches</li> <li>• secondary injection tests</li> <li>• primary injection tests</li> <li>• TMR radio's</li> <li>• SCADA</li> <li>• remote control</li> <li>• Over current</li> <li>• earth fault</li> <li>• sensitive earth fault</li> <li>• inverse time curves</li> <li>• definite time curves</li> <li>• tripping and reclose</li> <li>• DC and AC supplies</li> <li>• alarms</li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage</li> <li>• of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards and Identifying hazards</li> <li>• Inspect</li> <li>• Legislation and MSDS</li> <li>• Notification</li> <li>• OHS practices and OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>

<b>Evidence Guide</b>			
Critical Aspects of Competence	Assessment requires evidence that the candidate: <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>		
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: <ul style="list-style-type: none"> <li>• Occupational Health and Safety principles</li> <li>• Statutory and safety considerations</li> <li>• Electrical equipment - protection and control schemes</li> <li>• Discrete protection schemes - isolation and tagging procedures</li> <li>• Protection devices - maintenance and commission principles</li> <li>• Manufacturers' requirements</li> <li>• Disposal procedures for insulating materials</li> <li>• Visual inspection procedures -substations</li> <li>• Surge relay operation and maintenance - substations</li> <li>• Analyze and interpret results and measurements - substations</li> <li>• Commissioning of distribution protection and control systems - substations</li> <li>• Voltage regulation scheme principles - substations</li> <li>• Use of test equipment on a discrete protection scheme - substations</li> </ul>		
Underpinning Skills	Demonstrates skills to: <ul style="list-style-type: none"> <li>• Occupational Health and Safety practices</li> <li>• Electrical safe working practice</li> <li>• Statutory and safety considerations</li> <li>• Electrical equipment - protection and control schemes</li> <li>• Discrete protection schemes - isolation and tagging procedures</li> <li>• Protection devices - maintenance and commission</li> <li>• Manufacturers' requirements</li> <li>• Disposal procedures for insulating materials</li> <li>• Visual inspection procedures -substations</li> <li>• Surge relay operation and maintenance - substations</li> <li>• Analyze and interpret results and measurements - substations</li> <li>• Commissioning of distribution protection and control systems – substations</li> <li>• Voltage regulation scheme principles - substations</li> <li>• Use of test equipment on a discrete protection scheme - substations</li> </ul>		
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to		
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	information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.



<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Respond to Technical Enquiries and Requests</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 18 0612</u></a>
<b>Unit Descriptor</b>	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.

<b>Elements</b>	<b>Performance Criteria</b>
1. Prepare to respond to technical enquiries and requests	<p>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.</p> <p>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.</p> <p>1.3 OHS policies and procedures to be followed for the work to be performed are received and confirmed.</p> <p>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.</p> <p>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.</p> <p>1.6 Scope of responsibility and process of relevant work permit(s) issue is identified, received and confirmed according to requirements and established procedures.</p> <p>1.7 Relevant responsibility associated with First 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.</p> <p>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.</p> <p>1.9 Workplace and the work schedule is confirmed according</p>

	<p>to given instructions for a quality outcome and to minimize risk and damage to property, commerce, stock and individuals in accordance and established procedures.</p> <p>1.10 Electricity infrastructure assets, related voltages and requirements, where applicable, for working safely near live electrical apparatus as non-electrical worker are identified.</p> <p>1.11 Safe approach distances including any zones thereof that may apply, as defined in industry guidelines, requirements and/or established procedures for the intended work are confirmed.</p>
<p>2. Carry out responses to technical enquiries and requests</p>	<p>2.1 OHS principles and practices to reduce the incidents of accidents are identified in accordance with given instructions, requirements and/or established procedures.</p> <p>2.2 Enquiries and/or requests are responded to according to requirements and established procedures, and in a timely manner.</p> <p>2.3 Working safely and complying with all safety requirements for responding to technical enquiries and requests are followed in accordance with given instructions and established outlines / procedures.</p> <p>2.4 Processes for monitoring and reporting/referring hazards and OHS risks to the immediate authorized personnel for directions according to established procedures are followed.</p> <p>2.5 Non-routine events are referred to the immediate authorized personnel for directions according to established procedures.</p> <p>2.6 Apply essential knowledge and associated skills in the application of responding to technical enquiries and requests to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> <p>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.</p>
<p>3. Complete responses to technical enquiries and requests</p>	<p>3.1 <b>Work</b> schedule and anomalies for completion and checking of the work are reported to authorized personnel in accordance with established procedures.</p> <p>3.2 Processes for reporting to authorized personnel accidents and/or incidents are confirmed in accordance</p>

	<p>with established procedures.</p> <p>3.3 Requirements for returning work permit(s) and/or access Authorization permits, where applicable, are confirmed.</p> <p>3.4 Appropriate personnel are notified of work completion according to established procedures.</p> <p>3.5 Works completion records, report forms/data sheets are completed accurately in accordance with given instructions and established procedures</p>
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Variable	Range
This unit shall/may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>• safe working so defined by relevant regulatory agencies/bodies,</li> <li>• local government legislation,</li> <li>• Industry bi-partite body – guidelines/codes of practices or other related requirements for responding to technical enquires and requests</li> </ul>
Work functions may include:	<ul style="list-style-type: none"> <li>• the application of knowledge of electricity supply industry (ESI) transmission, distribution or rail/tram network requirements,</li> <li>• 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</li> <li>• 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. Knowledge and identification of key equipment used in industry.</li> <li>• Questioning (customer information gathering techniques) including observance of equipment, identification of anomalies from the norm and reporting of information.</li> <li>• Recognition of normal and abnormal industry situations may include: <ul style="list-style-type: none"> <li>• equipment</li> <li>• performance indicators</li> <li>• anomalies report</li> <li>• knowledge of critical system/network failures/anomalies and knowledge of key processes and</li> <li>• systems used in the industry e.g. maps, drawings etc., and safety and environment processes and practices used in the industry</li> </ul> </li> </ul> <p>Note: Examples performance indicators are - SAIDI - System Average Interruption Duration Index, SAIFI - System Average</p>

	<p>Interruption Frequency Index, MAIFI – Momentary Average Interruption Frequency Index, CAIDI - Customer Average Interruption Duration Index</p> <p>Enquiries may be internal or with customers</p>
<p>The following constants and variables included in this unit:</p>	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons</li> <li>• Appropriate authorities</li> <li>• Assessing risk</li> <li>• Authorization</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Established procedures.</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Legislation</li> <li>• Internal and external customers</li> <li>• Notification.</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Work clearance systems.</li> </ul>

<b>Evidence Guide</b>	
<p>Critical Aspects of Competence</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
<p>Underpinning Knowledge and Attitudes</p>	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Occupational Health and Safety principles</li> <li>• Engineering applications of material properties.</li> <li>• Generation power systems</li> <li>• Transmission, distribution and rail power systems</li> <li>• Fundamentals for working safely near live electrical apparatus</li> <li>• Environmental fundamentals</li> <li>• Material handling and the environment</li> <li>• Enterprise specific - policy and procedure instructions</li> <li>• Enterprise specific - OHS instructions</li> <li>• Enterprise specific - technical drawings and documents</li> <li>• Technical enquiries and requests</li> </ul>
<p>Underpinning Skills</p>	<p>. Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Occupational Health and Safety practices</li> <li>• Engineering applications of material properties.</li> <li>• Generation power systems</li> <li>• Transmission, distribution and rail power systems</li> </ul>

	<ul style="list-style-type: none"> <li>• Fundamentals for working safely near live electrical apparatus</li> <li>• Material handling and the environment</li> <li>• Enterprise specific - policy and procedure instructions</li> <li>• Enterprise specific - OHS instructions</li> <li>• Technical enquiries and requests</li> </ul>
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: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

<b>Occupational Standard: Power Distribution Network Infrastructure/ System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Design Overhead Distribution System Installation</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 19 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the technical design of overhead distribution and sub transmission networks to relevant standards, including electrical clearances, electrical and mechanical loadings, earthing, environmental considerations, minor civil aspects and the handling of waterway, railway and other crossings. It also includes the necessary established procedures to ensure the line design conforms to specific organizational technical standards, operational and system planning requirements and incorporates the principles of safe design.

<b>Elements</b>	<b>Performance Criteria</b>
1. Plan and coordinate the safe design of overhead distribution systems	<p>1.1 OHS practices/procedures and Environmental and sustainable energy procedures, which may influence the design of overhead distribution systems, are reviewed and determined.</p> <p>1.2 Purpose of the design is established and expected outcomes of the work are confirmed with the appropriate personnel.</p> <p>1.3 Organizational established procedures, policies and specifications for the design are obtained or established with the appropriate personnel.</p> <p>1.4 Equipment/tools and personal protective equipment are selected and coordinated based on specified requirements and established procedures.</p> <p>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.</p> <p>1.6 Risk control measures are identified, prioritized and evaluated against the work schedule.</p> <p>1.7 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures</p> <p>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.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work.</p>

	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.
2. Carry out and coordinate the safe design of overhead distribution systems	<p>2.1 Circuit/system modeling is used to evaluate alternative proposals as per established procedures.</p> <p>2.2 OHS and sustainable energy principles, functionality and practices to avoid accidents and minimize waste are incorporated into the project in accordance with requirements and/or established procedures.</p> <p>2.3 System design decisions are made on the basis of safety and effective outcomes according to requirements and/or established procedures.</p> <p>2.4 Mathematical models of the distribution system are used to analyze the effectiveness of the finished project as per requirements and established procedures.</p> <p>2.5 Technical advice is given regarding 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.</p> <p>2.6 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.</p> <p>2.7 Solutions to non-routine problems are identified and implemented using acquired essential knowledge and associated skills according to requirements.</p> <p>2.8 Quality of work is monitored against personal performance agreement and/or established organizational and professional standards.</p>
3. Complete and coordinate the safe design of overhead distribution systems	<p>3.1 Final inspections of the design are undertaken to ensure they comply with all requirements and include all specifications and documentation needed to complete the design brief.</p> <p>3.2 Appropriate personnel are notified of completion and reports and/or completion documents are finalized .</p> <p>3.3 Reports and/or completion documents are submitted to relevant personnel/organizations for approval and, where applicable, statutory or regulatory approval.</p> <p>3.4 Approved copies of design documents are issued and records are updated in accordance with established procedures.</p>

Variable	Range		
<p>This unit shall/may be demonstrated in relation to :</p>	<ul style="list-style-type: none"> <li>• Pole (including wood, concrete, steel and composite) associated hardware including conductors (bare wire and covered )</li> <li>• Cross arms</li> <li>• insulators</li> <li>• stays</li> <li>• ACR</li> <li>• regulator</li> <li>• earthing</li> <li>• air break switches</li> <li>• gas switches</li> <li>• capacitor units</li> <li>• transformers</li> <li>• links</li> <li>• fuses</li> <li>• sectionalizes</li> <li>• surge arrestors</li> <li>• MV switchgear</li> <li>• LV switchgear</li> <li>• control boxes</li> <li>• communications equipment</li> <li>• luminaires/lanterns</li> <li>• signage</li> <li>• supervisory cable</li> <li>• cable TV</li> <li>• substations</li> <li>• relevant protection systems and associated civil works</li> </ul> <p>May include:</p> <ul style="list-style-type: none"> <li>• computer based drafting and design technologies</li> </ul>		
<p>The following constants and variables included in this unit:</p>	<ul style="list-style-type: none"> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards and Identifying hazards</li> </ul>		
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	<ul style="list-style-type: none"> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices and OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Safe design principles</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Occupational Health and Safety principles</li> <li>• Occupational Health and Safety principles -enterprise responsibilities</li> <li>• Engineering applications of mathematical principles</li> <li>• Engineering applications of mechanical principles</li> <li>• Engineering applications of material properties</li> <li>• Transmission, distribution and rail power systems</li> <li>• Power line distribution installation</li> <li>• Pole and hardware installation</li> <li>• Metering installations</li> <li>• Distribution overhead line component fundamentals</li> <li>• Power line safety implementation and monitoring</li> <li>• Statutory and safety considerations</li> <li>• Safe design principles</li> <li>• Medium Voltage SWER system</li> <li>• Environmental fundamentals</li> <li>• Power line environmental impact – implementation and monitoring</li> <li>• Interpretation of power distribution network drawings and documentation</li> <li>• Overhead distribution extension layout principles</li> <li>• Power system layouts</li> <li>• AC transmission system components</li> <li>• AC transmission line electrical parameters</li> <li>• AC transmission line equivalent circuit calculations</li> </ul>
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	<ul style="list-style-type: none"> <li>• Design distribution systems</li> <li>• Design characteristics of overhead and underground conductors and cables, poles and structures</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Electrical safe working practice</li> <li>• Occupational Health and Safety principles -enterprise responsibilities</li> <li>• Transmission, distribution and rail power systems</li> <li>• Power line distribution installation</li> <li>• Pole and hardware installation</li> <li>• Metering installations</li> <li>• Power line safety practices</li> <li>• Power line safety implementation and monitoring</li> <li>• Statutory and safety considerations</li> <li>• Safe design practices</li> <li>• Medium Voltage SWER system</li> <li>• Environmental fundamentals</li> <li>• Power line environmental impact – implementation and monitoring</li> <li>• Overhead distribution extension layout practices</li> <li>• Power system layouts</li> <li>• AC transmission system components</li> <li>• AC transmission line electrical parameters</li> <li>• Design distribution systems</li> <li>• Design characteristics of overhead and underground conductors and cables, poles and structures</li> </ul>
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	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

<b>Occupational standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Design Distribution Substations</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 20 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the technical design of distribution substations to relevant standards and specifications, including earthing, location of substation relevant to load, customer and environmental needs and minor civil aspects. It also includes the necessary established procedures to ensure the substation design conforms to specific organizational technical standards operational and system planning requirements and encompasses.

<b>Elements</b>	<b>Performance Criteria</b>
1. Plan and coordinate for the design of distribution substations	<p>1.1 OHS practices/procedures and environmental and sustainable energy procedures, which may influence the design of distribution substations, are reviewed and determined.</p> <p>1.2 Purpose of the design is established and expected outcomes of the work are confirmed with the appropriate personnel.</p> <p>1.3 Organizational established procedures on polices and specifications for the design are obtained or established with the appropriate personnel.</p> <p>1.4 Equipment/tools and personal protective equipment are selected and coordinated based on specified requirements and established procedures.</p> <p>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.</p> <p>1.6 Risk control measures are identified, prioritized and evaluated against the work schedule.</p> <p>1.7 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.</p> <p>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.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work.</p> <p>1.10 Site is prepared according to the work schedule and to minimize risk and damage to property, commerce, and</p>

	individuals in accordance with established procedures.
2. Carry out and coordinate the design of distribution substations	<p>2.1 Circuit/system modeling is used to evaluate alternative proposals as per established procedures.</p> <p>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.</p> <p>2.3 System design decisions are made on the basis of safety and effective outcomes according to requirements and/or established procedures.</p> <p>2.4 Mathematical models of the distribution system are used to analyze the effectiveness of the finish project as per requirements and established procedures.</p> <p>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.</p> <p>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.</p> <p>2.7 Solutions to non-routine problems are identified and implemented using acquired essential knowledge and associated skills according to requirements.</p> <p>2.8 Quality of work is monitored against personal performance agreement and/or established organizational and professional standards.</p>
3. Complete and coordinate the design of distribution substations	<p>3.1 Final inspections of the design are undertaken to ensure they comply with all requirements and include all specifications and documentations needed to complete the design brief.</p> <p>3.2 Appropriate personnel are notified of completion and reports and/or completion documents are finalized .</p> <p>3.3 Reports and/or completion documents are submitted to relevant personnel/organizations for approval and, where applicable, statutory or regulatory approval.</p> <p>3.4 Approved copies of design documents are issued and records are updated in accordance with established procedures.</p>

Variable	Range
This unit shall/may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>• the design of distribution substations</li> <li>• transformers</li> <li>• cables</li> <li>• Surge Div</li> <li>• MV Switchgear</li> <li>• LV Switchgear</li> <li>• links</li> <li>• relays</li> <li>• power supply</li> <li>• signage</li> <li>• bus bars</li> <li>• relevant protection systems including fuses and circuit breakers and associated civil works</li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices and OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Safe design principles</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>

<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement occupational health and safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Occupational Health and Safety principles</li> <li>• Electrical safe working practice</li> <li>• Occupational Health and Safety , enterprise responsibilities</li> <li>• Engineering applications of mathematical principles</li> <li>• Engineering applications of mechanical principles</li> <li>• Engineering applications of material properties</li> <li>• Generation power systems</li> <li>• Substations, power transformers and reactors</li> <li>• Metering installations</li> <li>• Statutory and safety considerations</li> <li>• Safe design principles</li> <li>• Switchgear installation</li> <li>• Medium Voltage distribution transformer principles</li> <li>• Feeder automation system</li> <li>• Environmental fundamentals</li> <li>• Distribution substation minor upgrade layout principles</li> <li>• Distribution transformer fundamentals</li> <li>• Distribution transformer operation</li> <li>• Distribution earthing system</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Electrical safe working practice</li> <li>• Occupational Health and Safety , enterprise responsibilities</li> <li>• Engineering applications of material properties</li> <li>• Generation power systems</li> <li>• Substations, power transformers and reactors</li> <li>• Metering installations</li> <li>• Statutory and safety considerations</li> <li>• Switchgear installation</li> <li>• Medium Voltage distribution transformer principles</li> <li>• Feeder automation system</li> <li>• Environmental fundamentals</li> <li>• Distribution substation minor upgrade layout</li> <li>• Distribution transformer fundamentals</li> <li>• Distribution transformer operation</li> <li>• Distribution earthing system</li> </ul>

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: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Design Public Lighting System Installation</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 21 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the technical design of public lighting systems. This includes pedestrian and traffic route lighting standards utilizing appropriate software to generate design conformance. These activities should be undertaken with minimal supervision and technical support.

<b>Elements</b>	<b>Performance Criteria</b>
1. Plan and coordinate for the design of public lighting systems	<p>1.1 OHS practices/procedures and Environmental and sustainable Energy procedures which may influence the design of public lighting systems are reviewed and determined.</p> <p>1.2 Purpose of the design is established and expected outcomes of the work are confirmed with the appropriate personnel.</p> <p>1.3 Organizational established procedures on polices and specifications for the design are obtained or established with the appropriate personnel.</p> <p>1.4 Equipment/tools and personal protective equipment are selected and coordinated based on specified requirements and established procedures.</p> <p>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.</p> <p>1.6 Risk control measures are identified, prioritized and evaluated against the work schedule.</p> <p>1.7 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.</p> <p>1.8 Resources including personal, equipment, tools and personnel protective equipment required for the job are identified, scheduled and coordinated and confirmed in a safe and technical working order.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work.</p> <p>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.</p> <p>1.11 Personnel participating in the work, including plant</p>



	<p>operators and contractors, are fully briefed and respective responsibilities coordinated and authorized where applicable in accordance with established procedures.</p>
<p>2. Carry out and coordinate the design of public lighting systems</p>	<p>2.1 Circuit/system modeling is used to evaluate alternative proposals as per established procedures.</p> <p>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.</p> <p>2.3 System design decisions are made on the basis of safety and effective outcomes according to requirements and/or established procedures.</p> <p>2.4 Mathematical models of the distribution system are used to analyze the effectiveness of the finish project as per requirements and established procedures.</p> <p>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.</p> <p>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.</p> <p>2.7 Solutions to non-routine problems are identified and implemented using acquired essential knowledge and associated skills according to requirements.</p> <p>2.8 Quality of work is monitored against personal performance agreement and/or established organizational and professional standards.</p>
<p>3. Complete and coordinate the design of public lighting systems</p>	<p>3.1 Final inspections of the design are undertaken to ensure they comply with all requirements and include all specifications and documentations needed to complete the design brief.</p> <p>3.2 Appropriate personnel are notified of completion and reports and/or completion documents are finalized.</p> <p>3.3 Reports and/or completion documents are submitted to relevant personnel/organizations for approval and, where applicable, statutory or regulatory approval.</p> <p>3.4 Approved copies of design documents are issued and records are updated in accordance with established procedures.</p>

Variable	Range
This Competence Standard Unit shall/may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>• the design of public lighting systems pole (including wood, concrete, steel and composite) associated hardware including conductors (underground, bare wire and aerial bundle cable),</li> <li>• LV Switchgear</li> <li>• Lanterns and lamps</li> <li>• brackets</li> <li>• signage</li> <li>• supervisory cable</li> <li>• cable TV</li> <li>• Substations</li> <li>• relevant protection systems and associated civil works</li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards and Identifying hazards</li> <li>• Legislation</li> <li>• MSDS</li> <li>• OHS practices and OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Safe design principles</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>

### Evidence Guide

Critical aspects of Competence	Assessment requires evidence that the candidate: <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> </ul>
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	<ul style="list-style-type: none"> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes.	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Occupational Health and Safety principles</li> <li>• Electrical safe working practice</li> <li>• Occupational Health and Safety , enterprise responsibilities</li> <li>• Engineering applications of mathematical principles</li> <li>• Engineering applications of mechanical principles</li> <li>• Engineering applications of material properties</li> <li>• Transmission, distribution and rail power systems</li> <li>• Installation and maintenance of public lighting and associated equipment</li> <li>• Statutory and safety considerations</li> <li>• Safe design principles</li> <li>• Environmental fundamentals</li> <li>• Principles of lighting design</li> <li>• Principles in drafting street lighting system</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Electrical safe working practice</li> <li>• Occupational Health and Safety , enterprise responsibilities</li> <li>• Engineering applications of material properties</li> <li>• Transmission, distribution and rail power systems</li> <li>• Installation and maintenance of public lighting and associated equipment</li> <li>• Statutory and safety considerations</li> <li>• Lighting design</li> <li>• Drafting street lighting system</li> </ul>
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	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Investigate Quality of Supply Issues</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 22 0612</u></a>
<b>Unit Descriptor</b>	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.

<b>Elements</b>	<b>Performance Criteria</b>
1. Plan and coordinate for the investigation of issues in the quality of supply	<p>1.1 OHS practices/procedures and Environmental and sustainable energy procedures, which may influence the investigation of issues in the quality of supply, are reviewed and determined.</p> <p>1.2 Purpose of the investigation is established and expected outcomes of the work are confirmed with the appropriate personnel.</p> <p>1.3 Organizational established procedures on policies and specifications for the investigation are obtained or established with the appropriate personnel.</p> <p>1.4 Equipment/tools and personal protective equipment are selected and coordinated based on specified requirements and established procedures.</p> <p>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.</p> <p>1.6 Risk control measures are identified, prioritized and evaluated against the work schedule.</p> <p>1.7 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.</p> <p>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.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work.</p> <p>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.</p> <p>1.11 Personnel participating in the work, including plant operators and contractors, are fully briefed and</p>

	<p>respective responsibilities coordinated and authorized where applicable in accordance with established procedures.</p> <p>1.12 Positioning of road signs, barriers and warning devices is planned in accordance with requirements.</p>		
<p>2. Carry out and coordinate the investigation of issues in the quality of supply</p>	<p>2.1 Circuit/system modeling is used to evaluate alternative proposals as per established procedures</p> <p>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.</p> <p>2.3 Investigation decisions are made on the basis of safety and effective outcomes according to requirements and/or established procedures.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>2.7 Solutions to non-routine problems are identified and implemented using acquired essential knowledge and associated skills according to requirements.</p> <p>2.8 Quality of work is monitored against personal performance agreement and/or established organizational and professional standards.</p> <p>2.9 Testing of quality is undertaken according to requirements and established procedures.</p>		
<p>3. Complete and coordinate the investigation of issues in the quality of supply</p>	<p>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.</p> <p>3.2 Appropriate personnel are notified of completion and reports and/or completion documents are finalized .</p> <p>3.3 Reports and/or completion documents are submitted to relevant personnel/organizations for approval and, where applicable, statutory or regulatory approval.</p>		
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	3.4 Approved copies of quality assessment documents are issued and records are updated in accordance with established procedures.
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Variable	Range
This unit shall/may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>the investigation of supply issues distribution feeders/ networks, substations, transformers, MV switchgear, LV switchgear, relevant protection systems, fuses and circuit breakers</li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>Appropriate and relevant persons (see Personnel)</li> <li>Appropriate authorities</li> <li>Appropriate work platform</li> <li>Assessing risk</li> <li>Assessment</li> <li>Authorization</li> <li>Confined space</li> <li>Diagnostic, testing and restoration</li> <li>Documenting detail work events, record keeping and or storage of information</li> <li>Drawings and specifications</li> <li>Emergency</li> <li>Environmental and sustainable energy procedures</li> <li>Environmental legislation</li> <li>Environmental management documentation</li> <li>Established procedures</li> <li>Fall prevention</li> <li>Hazards</li> <li>Identifying hazards</li> <li>Inspect</li> <li>Legislation</li> <li>MSDS</li> <li>Notification</li> <li>OHS practices and OHS issues</li> <li>Permits and/or permits to work</li> <li>Personnel</li> <li>Quality assurance systems</li> <li>Requirements</li> <li>Safe design principles</li> <li>Testing procedures</li> <li>Work clearance systems</li> </ul>

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: <ul style="list-style-type: none"> <li>Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> </ul>

	<ul style="list-style-type: none"> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Occupational Health and Safety principles</li> <li>• Electrical safe working practice</li> <li>• Occupational Health and Safety , enterprise responsibilities</li> <li>• Safe design principles</li> <li>• Test equipment – fundamentals</li> <li>• Test equipment E – field</li> <li>• Quality of supply measures</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Occupational Health and Safety practices</li> <li>• Electrical safe working practice</li> <li>• Occupational Health and Safety , enterprise responsibilities</li> <li>• Safe design practices</li> <li>• Test equipment E – field</li> <li>• Quality of supply measures</li> </ul>
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	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Organize and Implement Line and Easement Surveys</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 23 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the surveying of distribution 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.

<b>Elements</b>	<b>Performance Criteria</b>
1. Plan and coordinate the organization and implementation of line and easement surveys	<p>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.</p> <p>1.2 Purpose of the line and easement surveys is established and expected outcomes of the work are confirmed with the appropriate personnel.</p> <p>1.3 Organizational established procedures on policies and specifications for the design are obtained or established with the appropriate personnel.</p> <p>1.4 Equipment/tools and personnel protective equipment are selected and coordinated based on specified requirements and established procedures.</p> <p>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.</p> <p>1.6 Risk control measures are identified, prioritized and evaluated against the work schedule.</p> <p>1.7 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.</p> <p>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.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work.</p> <p>1.10 Site is prepared according to the work schedule and to minimize risk and damage to property, commerce, and</p>



	<p>individuals in accordance with established procedures.</p> <p>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.</p> <p>1.12 Positioning of road signs, barriers and warning devices is planned in accordance with requirements</p>
2. Carry out and coordinate the organization and implementation of line and easement surveys	<p>2.1 Circuit/system modeling is used to evaluate alternative proposals as per established procedures.</p> <p>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.</p> <p>2.3 Survey design decisions are made on the basis of safety and effective outcomes according to requirements and/or established procedures.</p> <p>2.4 Mathematical models of the distribution system are used to analyze the effectiveness of the finished project as per requirements and established procedures.</p> <p>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.</p> <p>2.6 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.</p> <p>2.7 Solutions to non-routine problems are identified and implemented using acquired essential knowledge and associated skills according to requirements.</p> <p>2.8 Quality of work is monitored against personal performance agreement and/or established organizational and professional standards.</p> <p>2.9 Work teams/groups are arranged/coordinated/evaluated to ensure planned goals are met according to established procedures.</p>
3. Complete and coordinate the organization and implementation of line and easement	<p>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.</p> <p>3.2 Appropriate personnel are notified of completion and reports and/or completion documents are finalized.</p>

surveys	<p>3.3 Reports and/or completion documents are submitted to relevant personnel/organizations for approval and, where applicable, statutory or regulatory approval.</p> <p>3.4 Approved copies of survey documents are issued and records are updated in accordance with established procedures.</p>
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Variable	Range
This unit shall/may be demonstrated in relation to:	<ul style="list-style-type: none"> <li>• the organization and implementation of line</li> <li>• Survey instruments (theodolites, measuring devices, compasses, inclinometer);</li> <li>• Survey software Poles;</li> <li>• conductors – bare wire and aerial bundled cable;</li> <li>• cross arms;</li> <li>• insulators;</li> <li>• substations ;</li> <li>• transformers;</li> <li>• MV switchgear;</li> <li>• LV switchgear</li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage</li> <li>• of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> </ul>

	<ul style="list-style-type: none"> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Safe design principles</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement occupational health and safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Occupational Health and Safety principles</li> <li>• Electrical safe working practice</li> <li>• Occupational Health and Safety principles - enterprise responsibilities</li> <li>• Safe design principles</li> <li>• Surveying techniques</li> <li>• Project management</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Electrical safe working practice</li> <li>• Occupational Health and Safety practices</li> <li>• Surveying techniques</li> <li>• Project management</li> <li>• Safe design practices</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Commission Network Protection and Control System Installation (Interdependent)</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 24 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the commissioning of network protection and control systems in interdependent situations and includes isolation, inspection, monitoring, testing, adjustment, and repair, refurbishment and or overhaul and functional checks. It also includes schemes such as, CB Fail, master controlled Earth Fault, impedance and differential relays inter tripping, blocking, synchronizing, pilot wire, phase comparison, load shedding, voltage control, parallel operation and load rejection. This includes commissioning of discrete and interdependent schemes.

<b>Elements</b>	<b>Performance Criteria</b>
1. Plan for the commissioning of network protection and control systems (interdependent)	<p>1.1 OHS practices/procedures and environmental and sustainable energy procedures, which may influence the commissioning of, network protection and control systems (interdependent) are reviewed and determined.</p> <p>1.2 Purpose of the commissioning of network protection and control systems (interdependent) is established after data is analyzed and expected outcomes of the work are confirmed with the appropriate personnel.</p> <p>1.3 Organizational established procedures on policies and specifications for the commissioning of network protection and control systems (interdependent) are obtained or established with the appropriate personnel.</p> <p>1.4 Testing procedures are discussed with/directed to the appropriate personnel in order to ascertain the project brief.</p> <p>1.5 Testing parameters are established from organizational established procedures on polices and specifications.</p> <p>1.6 Equipment/tools and personal protective equipment is selected based on specified Performance Criteria and established procedures.</p> <p>1.7 Work roles and tasks are allocated according to requirements and individuals' competencies.</p> <p>1.8 Work is prioritized and sequenced for the most efficient/effective outcome, completed within an acceptable timeframe to a quality standard and in accordance with established procedures.</p>

	<p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work.</p> <p>1.10 Risk control measures are identified, prioritized and evaluated against the work schedule.</p> <p>1.11 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.</p>
<p>2. Carry out commissioning of network protection and control systems (interdependent)</p>	<p>2.1 Circuit/system modeling is used to evaluate alternative proposals as per established procedures.</p> <p>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.</p> <p>2.3 <b>Commissioning of network protection and control systems (interdependent)</b> decisions are made on the basis of safety and effective outcomes according to requirements and/or established procedures.</p> <p>2.4 Mathematical and/or engineering models of the schemes are used to analyze the effectiveness of the finished project as per requirements and established procedures.</p> <p>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.</p> <p>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.</p> <p>2.7 Testing of network protection and control systems (interdependent) is undertaken according to requirements and established procedures.</p> <p>2.8 Work teams/groups are arranged/coordinated/evaluated to ensure planned goals are met according to established procedures.</p> <p>2.9 Solutions to non-routine problems are identified and implemented, using acquired essential knowledge and associated skills, according to requirements.</p> <p>2.10 Quality of work is monitored against personal performance agreement and/or established organizational and professional standards.</p> <p>2.11 Strategic plans are developed incorporating organization</p>

	initiatives as per established procedures.
3. Complete commissioning of network protection and control systems (interdependent)	<p>3.1 Final inspections of the network protection and control systems (interdependent) are undertaken to ensure they comply with all requirements and include all specifications and documentations needed to complete the project.</p> <p>3.2 Appropriate personnel are notified of completion and reports and/or completion documents are finalized /commissioned.</p> <p>3.3 Reports and/or completion documents are submitted to relevant personnel/organizations for approval and, where applicable, statutory or regulatory approval.</p> <p>3.4 Approved copies of the commissioning of network protection and control systems (interdependent) documents are issued and records updated in accordance with established procedures.</p>

Variable	Range
This unit shall/may be demonstrated in relation to the commissioning of network protection and control systems (interdependent):	<ul style="list-style-type: none"> <li>• Over current</li> <li>• Frame leakage</li> <li>• Cooling</li> <li>• Bucholz</li> <li>• DC Supplies</li> <li>• Restricted Earth</li> <li>• Sensitive Earth Fault</li> <li>• CB Fail</li> <li>• Reclose</li> <li>• DC Frame leakage</li> <li>• CEL Fail</li> <li>• Under Frequency load shed Instrument Transformers</li> <li>• Trip/Control circuits</li> <li>• Alarms</li> <li>• DC Supplies</li> <li>• CB Fail protection</li> <li>• Master controlled Earth Fault</li> <li>• Inter tripping</li> <li>• Blocking</li> <li>• Synchronizing</li> <li>• Pilot Wire</li> <li>• Phase Comparison</li> <li>• Load Shedding</li> <li>• Voltage control</li> <li>• parallel operation</li> <li>• load rejection</li> <li>• Circuit isolations and restorations</li> <li>• mechanical adjustments</li> </ul>

	<ul style="list-style-type: none"> <li>• calibration and function tests</li> <li>• reporting</li> <li>• signals</li> <li>• thermals</li> <li>• contra phase</li> <li>• backup</li> <li>• reverse current</li> </ul>
The following constants and variables included in this unit	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation and management documentation</li> <li>• Established procedures</li> <li>• Fall prevention, Hazards and Identifying hazards</li> <li>• Legislation</li> <li>• MSDS</li> <li>• OHS practices and OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel and Requirements</li> <li>• Quality assurance systems</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>

<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Occupational Health and Safety principles</li> <li>• Occupational Health and Safety , - enterprise responsibilities</li> <li>• Statutory and safety considerations</li> <li>• Electrical equipment - protection and control schemes</li> </ul>

	<ul style="list-style-type: none"> <li>• Discrete protection schemes - isolation and tagging procedures</li> <li>• Protection devices - maintenance and commissioning principles</li> <li>• Protection devices - manufacturers requirements</li> <li>• Disposal procedures for insulating materials</li> <li>• Visual inspection procedures - substations</li> <li>• Surge relay operation and maintenance - substations</li> <li>• Commissioning of discrete protection devices - substations</li> <li>• Analyze and interpret results and measurements - substations</li> <li>• Static reactive plant principles - substations</li> <li>• Use of test equipment on discrete protection scheme - substation</li> <li>• Discrete protection systems</li> <li>• Interdependent protection systems</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Electrical safe working practices</li> <li>• Occupational Health and Safety , - enterprise responsibilities</li> <li>• Statutory and safety considerations</li> <li>• Electrical equipment - protection and control schemes</li> <li>• Discrete protection schemes - isolation and tagging procedures</li> <li>• Protection devices - maintenance and commissioning</li> <li>• Protection devices - manufacturers requirements</li> <li>• Disposal procedures for insulating materials</li> <li>• Visual inspection procedures - substations</li> <li>• Surge relay operation and maintenance - substations</li> <li>• Commissioning of discrete protection devices - substations</li> <li>• Analyze and interpret results and measurements - substations</li> <li>• Static reactive plant principles - substations</li> <li>• Use of test equipment on discrete protection scheme - substation</li> <li>• Discrete protection systems</li> <li>• Interdependent protection systems</li> </ul>
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	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.



Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV	
Unit Title	Test and Maintain Metering Scheme
Unit Code	<a href="#">EIS DNI4 25 0612</a>
Unit Descriptor	This unit covers the testing of metering schemes and includes isolation, inspection, monitoring, testing, adjustment, and repair, refurbishment and or overhaul and functional checks on schemes including ammeters, voltmeters, watt meters, VAR meters and energy metering. It also includes the understanding of the purpose of the testing so as to prove accuracy and suitability of the metering for the required task.

Elements	Performance Criteria
1. Plan for the testing and maintenance of metering schemes	<p>1.1 OHS practices/procedures and environmental and sustainable energy procedures, which may influence the testing and maintenance of metering schemes, are reviewed and determined.</p> <p>1.2 Purpose of the <b>testing and maintenance of metering schemes</b> is established after data is analyzed and expected outcomes of the work are confirmed with the appropriate personnel.</p> <p>1.3 Organizational established procedures on policies and specifications for the testing and maintenance of metering schemes are obtained or established with the appropriate personnel.</p> <p>1.4 Testing procedures are discussed with/directed to the appropriate personnel in order to ascertain the project brief.</p> <p>1.5 Testing parameters are established from organizational established procedures on policies and specifications.</p> <p>1.6 Equipment/tools and personal protective equipment are selected based on specified Performance Criteria and established procedures.</p> <p>1.7 Work roles and tasks are allocated according to requirements and individuals' competencies.</p> <p>1.8 Work is prioritized and sequenced for the most efficient/effective outcome, completed within an acceptable timeframe to a quality standard and in accordance with established procedures.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work.</p> <p>1.10 Risk control measures are identified, prioritized and evaluated against the work schedule.</p>

	1.11 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.		
2. Carry out the testing and maintenance of metering schemes	<p>2.1 Circuit/system modeling is used to evaluate alternative proposals as per established procedures.</p> <p>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.</p> <p>2.3 Testing and maintenance of metering schemes decisions are made on the basis of safety and effective outcomes according to requirements and/or established procedures.</p> <p>2.4 Mathematical/engineering models of the testing and maintenance of metering schemes are used to analyze the effectiveness of the finished project as per requirements and established procedures.</p> <p>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.</p> <p>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.</p> <p>2.7 Testing and maintenance of metering schemes is undertaken according to requirements and established procedures.</p> <p>2.8 Work teams/groups are arranged/coordinated/evaluated to ensure planned goals are met according to established procedures.</p> <p>2.9 Solutions to non-routine problems are identified and implemented, using acquired essential knowledge and associated skills, according to requirements.</p> <p>2.10 Quality of work is monitored against personal performance agreement and/or established organizational and professional standards.</p> <p>2.11 Strategic plans are developed incorporating organization initiatives as per established procedures.</p>		
3. Complete the testing and maintenance of metering schemes	<p>3.1 Final inspections of the testing and maintenance of metering schemes are undertaken to ensure they comply with all requirements and include all specifications and documentations needed to complete the project.</p> <p>3.2 Appropriate personnel are notified of completion and</p>		
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	<p>reports and/or completion documents are finalized /commissioned.</p> <p>3.3 Reports and/or completion documents are submitted to relevant personnel/organizations for approval and, where applicable, statutory or regulatory approval.</p> <p>3.4 Approved copies of the testing and maintenance of metering schemes documents are issues and records are updated in accordance with established procedures</p>
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Variable	Range
This Competence Standard Unit shall/may be demonstrated in relation to the testing and maintenance of metering schemes:	<ul style="list-style-type: none"> <li>• Isolation,</li> <li>• functional checks,</li> <li>• inspection,</li> <li>• monitoring,</li> <li>• testing,</li> <li>• adjustment, and repair</li> <li>• refurbishment and or overhaul procedures on schemes including : <ul style="list-style-type: none"> <li>• ammeters,</li> <li>• voltmeters,</li> <li>• watt meters,</li> <li>• VAR meters and</li> <li>• energy metering</li> </ul> </li> </ul>
The following constants and variables included in the Range Statement of this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention, Hazards and Identifying hazards</li> <li>• Legislation and MSDS</li> <li>• OHS practices and OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel and Requirements</li> <li>• Quality assurance systems</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>

<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Occupational Health and Safety principles - enterprise responsibilities</li> <li>• Statutory and safety considerations</li> <li>• Visual inspection procedures</li> <li>• Locate and rectify faults in electrical equipment</li> <li>• Metering devices and principles</li> <li>• Test equipment C – metering</li> <li>• Disconnect and reconnect fixed wiring electrical equipment fundamentals</li> <li>• Disconnect and reconnect fixed wiring electrical equipment principles</li> <li>• Harmonics Fault finding and diagnostic techniques</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Electrical safe working practices</li> <li>• Statutory and safety considerations</li> <li>• Visual inspection procedures</li> <li>• Locate and rectify faults in electrical equipment</li> <li>• Metering devices and principles</li> <li>• Test equipment C – metering</li> <li>• Disconnect and reconnect fixed wiring electrical equipment</li> <li>• Harmonics Fault finding and diagnostic techniques</li> </ul>
Resources Implication	<p>Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.</p>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the work place or in a simulated work place setting.</p>

<b>Occupational Standard: Power Distribution Network Infrastructure/ System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Perform Accuracy Checks on Instrument Transformers</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 26 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the task of undertaking accuracy checks on instrument transformers and includes proving their functionality. It also includes current and voltage instrument transformers having various operating principles, which are designed for metering, protection, and monitoring or control usage. It also encompasses tasks associated with the isolation from other secondary circuits, inspection, measurement of excitation curves, measurement of phase and ratio errors and comparison of results with previous historical results and/or published specifications.

<b>Elements</b>	<b>Performance Criteria</b>
1. Plan for accuracy checks on instrument transformers	<p>1.1 OHS practices/procedures and environmental and sustainable energy procedures, which may influence the performance of accuracy checks on instrument transformers, are reviewed and determined.</p> <p>1.2 Purpose of the performance of accuracy checks on instrument transformers is established after data is analyzed and expected outcomes of the work are confirmed with the appropriate personnel.</p> <p>1.3 Organizational established procedures on policies and specifications for the performance of accuracy checks on instrument transformers are obtained or established with the appropriate personnel.</p> <p>1.4 Testing procedures are discussed with/directed to the appropriate personnel in order to ascertain the project brief.</p> <p>1.5 Testing parameters are established from organizational established procedures on polices and specifications.</p> <p>1.6 Equipment/tools and personal protective equipment are selected based on specified Performance Criteria and established procedures.</p> <p>1.7 Work roles and tasks are allocated according to requirements and individuals' competencies.</p> <p>1.8 Work is prioritized and sequenced for the most efficient/ effective outcome, completed within an acceptable timeframe to a quality standard and in accordance with established procedures.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are</p>

	<p>resolved and activities coordinated to carry out work.</p> <p>1.10 Risk control measures are identified, prioritized and evaluated against the work schedule.</p> <p>1.11 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.</p>		
<p>2. Carry out accuracy checks on instrument transformers</p>	<p>2.1 Circuit/system modeling is used to evaluate alternative proposals as per established procedures.</p> <p>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.</p> <p>2.3 Performance of accuracy checks on instrument transformer decisions are made on the basis of safety and effective outcomes according to requirements and/or established procedures.</p> <p>2.4 Mathematical and/or engineering models of the performance of accuracy checks on instrument transformers are used to analyze the effectiveness of the finished project as per requirements and established procedures.</p> <p>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.</p> <p>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.</p> <p>2.7 Accuracy checks on instrument transformers are undertaken according to requirements and established procedures.</p> <p>2.8 Work teams/groups are arranged/coordinated/evaluated to ensure planned goals are met according to established procedures.</p> <p>2.9 Solutions to non-routine problems are identified and implemented, using acquired essential knowledge and associated skills, according to requirements.</p> <p>2.10 Quality of work is monitored against personal performance agreement and/or established organizational and professional standards.</p> <p>2.11 Strategic plans are developed incorporating organization initiatives as per established procedures.</p>		
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<p>3. Complete performance of accuracy checks on instrument transformers</p>	<p>3.1 Final review of test results on instrument transformers are undertaken to ensure they comply with all requirements and include all specifications and documentations needed to complete the project.</p> <p>3.2 Appropriate personnel are notified of completion and reports and/or completion documents are finalized / commissioned.</p> <p>3.3 Reports and/or completion documents are submitted to relevant personnel/organizations for approval and, where applicable, statutory or regulatory approval.</p> <p>3.4 Approved copies of the performance of accuracy checks on instrument transformers documents are issues and records are updated in accordance with established procedures.</p>
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Variable	Range
<p>This unit shall/may be demonstrated in relation to:</p>	<ul style="list-style-type: none"> <li>• the task of undertaking accuracy checks on instrument transformers and</li> <li>• current instrument transformers,</li> <li>• voltage instrument transformers</li> </ul>
<p>Appropriate authorities the following constants and variables included in this unit:</p>	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> </ul>

	<ul style="list-style-type: none"> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>
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<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Occupational Health and Safety principles</li> <li>• Occupational Health and Safety , enterprise responsibilities</li> <li>• Generation power systems</li> <li>• Transmission, distribution and rail power systems</li> <li>• Substations, power transmission and reactors</li> <li>• Coordinating permit access authority procedures</li> <li>• Statutory and safety considerations</li> <li>• System switching operations and authorization procedures - MV</li> <li>• System switching operations and authorization procedures - LV</li> <li>• Instrument transformers</li> <li>• Protection schemes</li> <li>• Generator control systems - EMV</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Electrical safe working practices</li> <li>• Occupational Health and Safety , enterprise responsibilities</li> <li>• Generation power systems</li> <li>• Transmission, distribution and rail power systems</li> <li>• Substations, power transmission and reactors</li> <li>• Coordinating permit access authority procedures</li> <li>• Statutory and safety considerations</li> <li>• System switching operations and authorization procedures - MV</li> <li>• System switching operations and authorization procedures - LV</li> <li>• Instrument transformers</li> <li>• Protection schemes</li> <li>• Generator control systems - EMV</li> </ul>
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 Assessment	Competence may be assessed through: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

<b>Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV</b>	
<b>Unit Title</b>	<b>Design Underground Distribution System Installation</b>
<b>Unit Code</b>	<a href="#"><u>EIS DNI4 27 0612</u></a>
<b>Unit Descriptor</b>	This unit covers the technical design of underground distribution and sub transmission networks to relevant standards, including cable sizing and locations, soil resistivity and heat dissipation, backfill and trenching details, minor civil aspects and dynamic and cyclic ratings. It also includes the necessary established procedures to ensure the line design conforms to specific organizational technical standards, operational and system planning requirements and encompasses.

<b>Elements</b>	<b>Performance Criteria</b>
1. Plan and coordinate for the design of underground distribution systems	<p>1.1 OHS practices/procedures and Environmental and sustainable Energy procedures, which may influence the design of underground distribution systems, are reviewed and determined.</p> <p>1.2 Purpose of the design is established after data is analyzed and expected outcomes of the work are confirmed with the appropriate personnel.</p> <p>1.3 Organizational established procedures or polices and specifications for the design are obtained or established with the appropriate personnel.</p> <p>1.4 Equipment/tools and personal protective equipment are selected and coordinated based on specified requirements and established procedures.</p> <p>1.5 Work is prioritized and sequenced for the most efficient/effective outcome, completed within an acceptable timeframe to a quality standard and in accordance with established procedures.</p> <p>1.6 Risk control measures are identified, prioritized and evaluated against the work schedule.</p> <p>1.7 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.</p> <p>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.</p> <p>1.9 Liaison and communication issues with other/authorized personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work.</p> <p>1.10 Site is prepared according to the work schedule and to minimize risk and damage to property, commerce, and</p>

	individuals in accordance with established procedures.
2. Carry out and coordinate the design of underground distribution systems	<p>2.1 Circuit/system modeling is used to evaluate alternative proposals as per established procedures.</p> <p>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.</p> <p>2.3 System design decisions are made on the basis of safety and effective outcomes according to requirements and/or established procedures.</p> <p>2.4 Mathematical models for the <b>design of the underground distribution system</b> are used to analyze the effectiveness of the finished project as per requirements and established procedures.</p> <p>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.</p> <p>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.</p> <p>2.7 Solutions to non-routine problems are identified and implemented, using acquired essential knowledge and associated skills, according to requirements.</p> <p>2.8 Quality of work is monitored against personal performance agreement and/or established organizational and professional standards.</p>
3. Complete and coordinate the design of underground distribution systems	<p>3.1 Final inspections of the design are undertaken to ensure they comply with all requirements and include all specifications and documentations needed to complete the project.</p> <p>3.2 Appropriate personnel are notified of completion and reports and/or completion documents are finalized /commissioned.</p> <p>3.3 Reports and/or completion documents are submitted to relevant personnel/organizations for approval and, where applicable, statutory or regulatory approval.</p> <p>3.4 Approved copies of design documents are issued and records are updated in accordance with established procedures.</p>

Variable	Range
This unit shall/may be demonstrated in relation to the design of underground distribution systems:	<ul style="list-style-type: none"> <li>• Underground cable</li> <li>• terminations</li> <li>• joints</li> <li>• Substations</li> <li>• mechanical protection</li> <li>• MV Switchgear</li> <li>• LV Switchgear</li> <li>• signage</li> <li>• relevant protection systems</li> <li>• relevant protection systems including:               <ul style="list-style-type: none"> <li>• fuses and circuit breakers and</li> <li>• associated civil works</li> </ul> </li> </ul>
The following constants and variables included in this unit:	<ul style="list-style-type: none"> <li>• Appropriate and relevant persons (see Personnel)</li> <li>• Appropriate authorities</li> <li>• Appropriate work platform</li> <li>• Assessing risk</li> <li>• Assessment</li> <li>• Authorization</li> <li>• Confined space</li> <li>• Diagnostic, testing and restoration</li> <li>• Documenting detail work events, record keeping and or storage of information</li> <li>• Drawings and specifications</li> <li>• Emergency</li> <li>• Environmental and sustainable energy procedures</li> <li>• Environmental legislation</li> <li>• Environmental management documentation</li> <li>• Established procedures</li> <li>• Fall prevention</li> <li>• Hazards</li> <li>• Identifying hazards</li> <li>• Inspect</li> <li>• Legislation</li> <li>• MSDS</li> <li>• Notification</li> <li>• OHS practices</li> <li>• OHS issues</li> <li>• Permits and/or permits to work</li> <li>• Personnel</li> <li>• Quality assurance systems</li> <li>• Requirements</li> <li>• Safe design principles</li> <li>• Testing procedures</li> <li>• Work clearance systems</li> </ul>

<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Implement occupational health and safety workplace procedures and practices including the use of risk control measures</li> <li>• Apply sustainable energy principles and practices</li> <li>• Conduct work observing the relevant legislation, regulations, polices and workplace procedures</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Occupational health and safety principles</li> <li>• Occupational health and safety principles -enterprise responsibilities</li> <li>• Engineering applications of mathematical principles</li> <li>• Engineering applications of mechanical principles</li> <li>• Engineering applications of material properties</li> <li>• Transmission, distribution and rail power systems</li> <li>• Underground cable installation</li> <li>• Underground cable construction</li> <li>• Power line safety practices</li> <li>• Power line safety - implementation and monitoring</li> <li>• Statutory and safety considerations</li> <li>• Safe design principles</li> <li>• Environmental fundamentals</li> <li>• Power line environmental impact – implementation and monitoring</li> <li>• Enterprises specific - technical drawing and documents</li> <li>• Underground mains layout principles</li> <li>• Power system layouts</li> <li>• Design characteristics of overhead and underground conductors and cables, poles and structures</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• Electrical safe working practice</li> <li>• Engineering applications of material properties</li> <li>• Transmission, distribution and rail power systems</li> <li>• Underground cable installation</li> <li>• Underground cable construction</li> <li>• Power line safety practices</li> <li>• Power line safety - implementation and monitoring</li> <li>• Statutory and safety considerations</li> <li>• Environmental fundamentals</li> <li>• Power line environmental impact – implementation and monitoring</li> <li>• Enterprises specific - technical drawing and documents</li> <li>• Underground mains layout practices</li> <li>• Power system layouts</li> <li>• Design characteristics of overhead and underground conductors and cables, poles and structures</li> </ul>

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: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV	
Unit Title	Plan and Organize Work
Unit Code	<a href="#">EIS DNI4 28 0612</a>
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	<p>1.1 <b>Objectives</b> are consistent with and linked to work activities in accordance with organizational aims</p> <p>1.2 Objectives are stated as measurable targets with clear time frames</p> <p>1.3 Support and commitment of team members are reflected in the objectives</p> <p>1.4 Realistic and attainable objectives are identified</p>
2. Plan and schedule work activities	<p>2.1 Tasks/work activities to be completed are identified and prioritized as directed</p> <p>2.2 Tasks/work activities are broken down into steps in accordance with set time frames and achievable components</p> <p>2.3 Task/work activities are assigned to appropriate team or individuals in accordance with agreed functions</p> <p>2.4 <b>Resources</b> are allocated as per requirements of the activity</p> <p>2.5 <b>Schedule of work activities</b> is coordinated with personnel concerned</p>
3. Implement work plans	<p>3.1 <b>Work methods and practices</b> are identified in consultation with personnel concerned</p> <p>3.2 <b>Work plans</b> are implemented in accordance with set time frames, resources and <b>standards</b></p>
4. Monitor work activities	<p>4.1 Work activities are monitored and compared with set objectives</p> <p>4.2 Work performance is monitored</p> <p>4.3 Deviations from work activities are reported and recommendations are coordinated with appropriate personnel and in accordance with set standards</p> <p>4.4 Reporting requirements are complied with in accordance with recommended format</p> <p>4.5 Observe timeliness of report</p>

	4.6 Files are established and maintained in accordance with standard operating procedures
5. Review and evaluate work plans and activities	<p>5.1 Work plans, strategies and implementation are reviewed based on accurate, relevant and current information</p> <p>5.2 Review is based on comprehensive consultation with appropriate personnel on outcomes of work plans and reliable feedback</p> <p>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</p> <p>5.4 Performance appraisal is conducted in accordance with organization rules and regulations</p> <p>5.5 Performance appraisal report is prepared and documented regularly as per organization requirements.</p> <p>5.6 Recommendations are prepared and presented to <b>appropriate personnel/authorities</b></p> <p>5.7 <b>Feedback mechanisms</b> are implemented in line with organization policies</p>

Variable	Range
Objectives	<ul style="list-style-type: none"> <li>• Specific</li> <li>• General</li> </ul>
Resources	<ul style="list-style-type: none"> <li>• Personnel</li> <li>• Equipment and technology</li> <li>• Services</li> <li>• Supplies and materials</li> <li>• Sources for accessing specialist advice</li> <li>• Budget</li> </ul>
Schedule of work activities	<ul style="list-style-type: none"> <li>• Daily</li> <li>• Work-based</li> <li>• Contractual</li> <li>• Regular</li> </ul>
Work methods and practices	<ul style="list-style-type: none"> <li>• Legislated regulations and codes of practice</li> <li>• Industry regulations and codes of practice</li> <li>• Occupational health and safety practices</li> </ul>
Work plans	<ul style="list-style-type: none"> <li>• Daily work plans</li> <li>• Project plans</li> <li>• Program plans</li> <li>• Resource plans</li> <li>• Skills development plans</li> <li>• Management strategies and objectives</li> </ul>
Standards	<ul style="list-style-type: none"> <li>• Performance targets</li> <li>• Performance management and evaluation systems</li> <li>• Occupational standards</li> <li>• Employment contracts</li> <li>• Client contracts</li> <li>• Discipline procedures</li> </ul>



	<ul style="list-style-type: none"> <li>• Workplace assessment guidelines</li> <li>• Internal quality assurance</li> <li>• Internal and external accountability and auditing requirements</li> <li>• Training Regulation Standards</li> <li>• Safety Standards</li> </ul>
Appropriate personnel/ authorities	<ul style="list-style-type: none"> <li>• Appropriate personnel include:</li> <li>• Management</li> <li>• Line Staff</li> </ul>
Feedback mechanisms	<p>Feedback mechanisms include:</p> <ul style="list-style-type: none"> <li>• Verbal feedback</li> <li>• Informal feedback</li> <li>• Formal feedback</li> <li>• Questionnaire</li> <li>• Survey</li> <li>• Group discussion</li> </ul>

<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• set objectives</li> <li>• planned and scheduled work activities</li> <li>• implemented work plans</li> <li>• monitored work activities</li> <li>• reviewed and evaluated work plans and activities</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• Organization's strategic plan, policies rules and regulations, laws and objectives for work unit activities and priorities</li> <li>• Organizations policies, strategic plans, guidelines related to the role of the work unit</li> <li>• Team work and consultation strategies</li> </ul>
Underpinning Skills	<p>Demonstrates skill of:</p> <ul style="list-style-type: none"> <li>• Planning</li> <li>• Leading</li> <li>• Organizing</li> <li>• Coordinating</li> <li>• Communication Skills</li> <li>• Inter-and intra-person/motivation skills</li> <li>• Presentation skills</li> </ul>
Resource Implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> <li>• Workplace or fully equipped location with necessary tools and equipment as well as consumable materials</li> </ul>
Methods of Assessment	<p>Competence may be accessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context for Assessment	<p>Competence may be assessed in the workplace or in simulated workplace setting.</p>

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV	
Unit Title	Migrate to New Technology
Unit Code	<a href="#">EIS DNI4 29 0612</a>
Unit Descriptor	This unit defines the competence required to apply skills and knowledge in using new or upgraded technology. The rationale behind this unit emphasizes the importance of constantly reviewing work processes, skills and techniques in order to ensure that the quality of the entire business process is maintained at the highest level possible through the appropriate application of new technology. To this end, the person is typically engaged in on-going review and research in order to discover and apply new technology or techniques to improve aspects of the organization's activities.

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

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

<b>Evidence Guide</b>	
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	<ul style="list-style-type: none"> <li>• Broad awareness of current technology trends and directions in the industry (e.g. systems/procedures, services, new developments, new protocols)</li> <li>• Knowledge of vendor product directions</li> <li>• Ability to locate appropriate sources of information regarding metal manufacturing and new technologies</li> <li>• Current industry products/services, procedures and techniques with knowledge of general features</li> <li>• Information gathering techniques</li> </ul>
Underpinning Skills	<ul style="list-style-type: none"> <li>• Research skills for identifying broad features of new technologies</li> <li>• Ability to assist in the decision making process</li> <li>• Literacy skills in regard to interpretation of technical manuals</li> <li>• Ability to solve known problems in a variety of situations and locations</li> <li>• Evaluate and apply new technology to assist in solving organizational problems</li> <li>• General analytical skills in relation to known problems</li> </ul>
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: <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Demonstration/ Observation with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the workplace or in a simulated workplace setting.

Occupational Standard: Power Distribution Network Infrastructure/ System Installation and Maintenance Level IV	
Unit Title	Establish Quality Standards
Unit Code	<a href="#">EIS DNI4 30 0612</a>
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to establish quality specifications for work outcomes and work performance. It includes monitoring and participation in maintaining and improving quality, identifying critical control points in the production of quality output and assisting in planning and implementing of quality assurance procedures.

Elements	Performance Criteria
1. Establish quality specifications for product	1.1 Market specifications are <b>sourced</b> and <b>legislated requirements</b> identified. 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 critical control points	2.1. Critical control points impacting on quality are identified. 2.2. Degree of risk for each hazard is determined. 2.3. Necessary documentation is accomplished in accordance with organization quality procedures
3. Assist in planning of quality assurance procedures	3.1 Procedures for each identified control point are developed to ensure optimum quality. 3.2 Hazards and risks are minimized through application of appropriate controls. 3.3 Processes to monitor the effectiveness of quality assurance procedures are developed.
4. Implement quality assurance procedures	4.1 Responsibilities for carrying out procedures are allocated to staff and contractors. 4.2 Instructions are prepared in accordance with the enterprise's quality assurance program. 4.3 Staff and contractors are given induction training on the quality assurance policy. 4.4 Staff and contractors are given in-service training relevant to their allocated procedures.
5. Monitor quality of work outcome	5.1 Quality requirements are identified 5.2 Inputs are inspected to confirm capability to meet quality requirements

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

Variable	Range
Sourced	<ul style="list-style-type: none"> <li>• End-users</li> <li>• Customers or stakeholders</li> </ul>
Legislated requirements	<ul style="list-style-type: none"> <li>• Verification of product quality as part of consumer legislation or specific legislation related to product content or composition.</li> </ul>
Safety procedures.	<ul style="list-style-type: none"> <li>• Use of tools and equipment for fabrication/production/manufacturing works</li> <li>• Workplace environment and handling of material safety,</li> <li>• Following occupational health and safety procedures designated for the task</li> <li>• Respect the policies, regulations, legislations, rule and procedures for manufacturing/production/fabrication works</li> </ul>

Evidence Guide	
Critical Aspect of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Monitored quality of work</li> <li>• Established quality specifications for product</li> <li>• Participated in maintaining and improving quality at work</li> <li>• Identified hazards and critical control points in the production of quality product</li> <li>• Assisted in planning of quality assurance procedures</li> <li>• Reported problems that affect quality</li> <li>• Implemented quality assurance procedures</li> </ul>

Underpinning Knowledge	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• work and product quality specifications</li> <li>• quality policies and procedures</li> <li>• improving quality at work</li> <li>• hazards and critical points of operation</li> <li>• obtaining and using information</li> <li>• applying federal and regional legislation within day-today work activities</li> <li>• accessing and using management systems to keep and maintain accurate records</li> <li>• requirements for correct preparation and operation</li> <li>• technical writing</li> </ul>
Underpinning Skills	<p>Demonstrates skills in:</p> <ul style="list-style-type: none"> <li>• monitoring quality of work</li> <li>• establishing quality specifications for product</li> <li>• participating in maintaining and improving quality at work</li> <li>• identifying hazards and critical control points in the production of quality product</li> <li>• assisting in planning of quality assurance procedures</li> <li>• reporting problems that affect quality</li> <li>• implementing quality assurance procedures</li> </ul>
Resource Implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> <li>• Workplace or fully equipped environment with necessary tools and equipment as well as consumable materials</li> </ul>
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview/ Written Test</li> <li>• Observation/Demonstration with Oral questioning</li> </ul>
Context of Assessment	<p>Competence may be assessed in the workplace or in a simulated workplace setting.</p>

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV	
Unit Title	Develop Individuals and Team
Unit Code	<a href="#">EIS DNI4 31 0612</a>
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	<p>1.1 <b>Learning and development needs</b> are systematically identified and implemented in line with <b>organizational requirements</b></p> <p>1.2 Learning plan to meet individual and group training and developmental needs is collaboratively developed and implemented</p> <p>1.3 Individuals are encouraged to self-evaluate performance and identify areas for improvement</p> <p>1.4 <b>Feedback on performance</b> of team members is collected from relevant sources and compared with established team learning process</p>
2. Foster individual and organizational growth	<p>2.1 Learning and development program goals and objectives are identified to match the specific knowledge and skills requirements of competence standards</p> <p>2.2 <b>Learning delivery methods</b> are appropriate to the learning goals, the learning style of participants and availability of equipment and resources</p> <p>2.3 Workplace learning opportunities and coaching/ mentoring assistance are provided to facilitate individual and team achievement of competencies</p> <p>2.4 Resources and timelines required for learning activities are identified and approved in accordance with organizational requirements</p>
3. Monitor and evaluate workplace learning	<p>3.1 Feedback from individuals or teams is used to identify and implement improvements in future learning arrangements</p> <p>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</p> <p>3.3 Modifications to learning plans are negotiated to improve the efficiency and effectiveness of learning</p> <p>3.4 Records and reports of competence are maintained within organizational requirement</p>
4. Develop team	<p>4.1 Open communication processes to obtain and share information is used by team</p>

commitment and cooperation	<p>4.2 Decisions are reached by the team in accordance with its agreed roles and responsibilities</p> <p>4.3 Mutual concern and camaraderie are developed in the team</p>
5. Facilitate accomplishment of organizational goals	<p>5.1 Team members actively participated in team activities and communication processes</p> <p>5.2 Teams members developed individual and joint responsibility for their actions</p> <p>5.3 Collaborative efforts are sustained to attain organizational goals</p>

Variable	Range
Learning and development needs	<ul style="list-style-type: none"> <li>• Coaching, monitoring and/or supervision</li> <li>• Formal/informal learning program</li> <li>• Internal/external training provision</li> <li>• Work experience/exchange/opportunities</li> <li>• Personal study</li> <li>• Career planning/development</li> <li>• Performance evaluation</li> <li>• Workplace skills assessment</li> <li>• Recognition of prior learning</li> </ul>
Organizational requirements	<ul style="list-style-type: none"> <li>• Quality assurance and/or procedures manuals</li> <li>• Goals, objectives, plans, systems and processes</li> <li>• Legal and organizational policy/guidelines and requirements</li> <li>• Safety policies, procedures and programs</li> <li>• Confidentiality and security requirements</li> <li>• Business and performance plans</li> <li>• Ethical standards</li> <li>• Quality and continuous improvement processes and standards</li> </ul>
Feedback on performance	<ul style="list-style-type: none"> <li>• Formal/informal performance evaluation</li> <li>• Obtaining feedback from supervisors and colleagues</li> <li>• Obtaining feedback from clients</li> <li>• Personal and reflective behavior strategies</li> <li>• Routine and organizational methods for monitoring service delivery</li> </ul>
Learning delivery methods	<ul style="list-style-type: none"> <li>• On the job coaching or monitoring</li> <li>• Problem solving</li> <li>• Presentation/demonstration</li> <li>• Formal course participation</li> <li>• Work experience and involvement in professional networks</li> <li>• Conference and seminar attendance</li> </ul>



<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• identified and implemented learning opportunities for others</li> <li>• gave and received feedback constructively</li> <li>• facilitated participation of individuals in the work of the team</li> <li>• negotiated plans to improve the effectiveness of learning</li> <li>• prepared learning plans to match skill needs</li> <li>• accessed and designated learning opportunities</li> </ul>
Underpinning Knowledge and Attitude	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• coaching and monitoring principles</li> <li>• understanding how to work effectively with team members who have diverse work styles, aspirations, cultures and perspective</li> <li>• understanding how to facilitate team development and improvement</li> <li>• understanding methods and techniques to obtain and interpreting feedback</li> <li>• understanding methods for identifying and prioritizing personal development opportunities and options</li> <li>• knowledge of career paths and competence standards in the industry</li> </ul>
Underpinning Skills	<p>Demonstrates skills in:</p> <ul style="list-style-type: none"> <li>• reading and understanding a variety of texts, preparing general information and documents according to target audience; spell with accuracy; use grammar and punctuation effectively</li> <li>• communication including receiving feedback and reporting, maintaining effective relationships and conflict management</li> <li>• planning skills to organize required resources and equipment to meet learning needs</li> <li>• coaching and mentoring skills to provide support to colleagues</li> <li>• reporting to organize information; assess information for relevance and accuracy; identify and elaborate on learning outcomes</li> <li>• facilitation to conduct small group training sessions</li> <li>• relating to people from a range of social, cultural, physical and mental backgrounds</li> </ul>
Resource Implications	Access to relevant workplace or appropriately simulated environment where assessment can take place
Methods of Assessment	<p>Competence may be accessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation / Demonstration with Oral Questioning</li> </ul>
Context of Assessment	Competence may be assessed in the workplace or in a simulated workplace setting.

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV	
Unit Title	Utilize Specialized Communication Skills
Unit Code	<a href="#">EIS DNI4 32 0612</a>
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to use specialized communication skills to meet specific needs of internal and external clients, conduct interviews, facilitate group discussions, and contribute to the development of communication strategies.

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

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

Variable	Range
Strategies	<ul style="list-style-type: none"> <li>• Recognizing own limitations</li> <li>• Utilizing techniques and aids</li> <li>• Providing written drafts</li> <li>• Verbal and non verbal communication</li> </ul>
Effective group interaction	<ul style="list-style-type: none"> <li>• Identifying and evaluating what is occurring within an interaction in a non-judgmental way</li> <li>• Using active listening</li> <li>• Making decision about appropriate words, behavior</li> <li>• Putting together response which is culturally appropriate</li> <li>• Expressing an individual perspective</li> <li>• Expressing own philosophy, ideology and background and exploring impact with relevance to communication</li> </ul>
Types of Interview	<ul style="list-style-type: none"> <li>• Related to staff issues</li> <li>• Routine</li> <li>• Confidential</li> <li>• Evidential</li> <li>• Non-disclosure</li> <li>• Disclosure</li> </ul>
Interview situations	<ul style="list-style-type: none"> <li>• Establish rapport</li> <li>• obtain facts and information</li> <li>• Facilitate resolution of issues</li> <li>• Develop action plans</li> <li>• Diffuse potentially difficult situation</li> </ul>

<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>• Demonstrated effective communication skills with clients and work colleagues accessing service</li> <li>• Adopted relevant communication techniques and strategies to meet client particular needs and difficulties</li> </ul>
Underpinning Knowledge and Values	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• communication process</li> <li>• dynamics of groups and different styles of group leadership</li> <li>• communication skills relevant to client groups</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• full range of communication techniques including: <ul style="list-style-type: none"> <li>• active listening</li> <li>• feedback</li> <li>• interpretation</li> <li>• role boundaries setting</li> <li>• negotiation</li> <li>• establishing empathy</li> <li>• communication strategies</li> </ul> </li> <li>• communication required to fulfill job roles as specified by the organization</li> </ul>
Resource Implications	Access to appropriate workplace where assessment can take place.
Methods of Assessment	<p>Competence may be assessed through</p> <ul style="list-style-type: none"> <li>• Interview/Written Test</li> <li>• Observation/Demonstration with Oral Questioning</li> </ul>
Context for Assessment	Competence may be assessed in the workplace or in a simulated workplace setting.

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV	
Unit Title	Manage and Maintain Small/Medium Business Operation
Unit Code	<a href="#">EIS DNI4 33 0612</a>
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 requirements	<p>1.1 Work requirements for a given time period are identified taking into consideration <b>resources</b> and constraints</p> <p>1.2 Work activities are prioritized based on business needs, requirements and deadlines</p> <p>1.3 If appropriate, work is allocated to relevant staff or contractors to optimize efficiency</p>
2. Monitor and manage work	<p>2.1 People, resources and/or equipment are coordinated to provide optimum results</p> <p>2.2 Staff, clients and/or contractors are communicated within a clear and regular manner, to monitor work in relation to <b>business goals</b> or timelines</p> <p>2.3 <b>Problem solving techniques</b> are applied to work situations to overcome difficulties and achieve positive outcomes</p>
3. Develop effective work habits	<p>3.1 Work and personal priorities are identified and a balance is achieved between competing priorities using appropriate <b>time management strategies</b></p> <p>3.2 Input from <b>internal and external sources</b> is sought and used to develop and refine new ideas and approaches</p> <p>3.3 Business or inquiries are responded to promptly and effectively</p> <p>3.4 Information is presented in a format appropriate to the industry and audience</p>
4. Interpret financial information	<p>4.1 Relevant documents and reports are identified</p> <p>4.2 Documents and reports are read and understood and any implications discussed with appropriate persons</p> <p>4.3 Data and numerical calculations are analyzed, checked, evaluated, organized and reconciled</p> <p>4.4 Daily financial records and cash flow are maintained correctly and in accordance with legal and accounting requirements</p>

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

Variable	Range
Resources may include:	<ul style="list-style-type: none"> <li>• staff</li> <li>• money</li> <li>• time</li> <li>• equipment</li> <li>• space</li> </ul>
Business goals may include:	<ul style="list-style-type: none"> <li>• sales targets</li> <li>• budgetary targets</li> <li>• team and individual goals</li> <li>• production targets</li> <li>• reporting deadlines</li> </ul>
Problem solving techniques may include:	<ul style="list-style-type: none"> <li>• gaining additional research and information to make better informed decisions</li> <li>• looking for patterns</li> <li>• considering related problems or those from the past and how they were handled</li> <li>• eliminating possibilities</li> <li>• identifying and attempting sub-tasks</li> <li>• collaborating and asking for advice or help from additional sources</li> </ul>
Time management strategies may include:	<ul style="list-style-type: none"> <li>• prioritizing and anticipating</li> <li>• short term and long term planning and scheduling</li> <li>• creating a positive and organized work environment</li> <li>• clear timelines and goal setting that is regularly reviewed and adjusted as necessary</li> <li>• breaking large tasks into smaller tasks</li> <li>• getting additional support if identified and necessary</li> </ul>
Internal and external sources may include:	<ul style="list-style-type: none"> <li>• staff and colleagues</li> <li>• management, supervisors, advisors or head office</li> <li>• relevant professionals such as lawyers, accountants, management consultants</li> <li>• professional associations</li> </ul>

<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>A person must be able to demonstrate:</p> <ul style="list-style-type: none"> <li>• ability to identify daily work requirements and allocate work appropriately</li> <li>• ability to interpret financial documents in accordance with legal requirements</li> </ul>
Underpinning Knowledge and Attitudes	<ul style="list-style-type: none"> <li>• 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</li> <li>• technical or specialist skills relevant to the business operation</li> <li>• relevant industry code of practice</li> <li>• planning techniques to establish realistic timelines and priorities</li> <li>• identification of relevant performance measures</li> <li>• quality assurance principles and methods</li> <li>• relevant marketing, management, sales and financial concepts</li> <li>• methods for monitoring performance and implementing improvements</li> <li>• structured approaches to problem solving, idea management and time management</li> </ul>
Underpinning Skills	<ul style="list-style-type: none"> <li>• interpret legal requirements, company policies and procedures and immediate, day-to-day demands</li> <li>• communication skills including questioning, clarifying, reporting, and giving and receiving constructive feedback</li> <li>• numeracy skills for performance information, setting targets and interpreting financial documents and reports</li> <li>• technical and analytical skills to interpret business document, reports and financial statements and projections</li> <li>• ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities</li> <li>• problem solving skills to develop contingency plans</li> <li>• using computers and software packages to record and manage data and to produce reports</li> <li>• evaluation skills for assessing work and outcomes</li> <li>• observation skills for identifying appropriate people, resources and to monitor work</li> </ul>
Resource Implications	Access to relevant workplace documentation, financial records, and equipment
Methods of Assessment	<p>Competence may be assessed through:</p> <ul style="list-style-type: none"> <li>• Interview / Written Test</li> <li>• Observation/Demonstration with Oral questioning</li> </ul>
Context for Assessment	Competence may be assessed in the workplace or in a simulated work environment.

Occupational Standard: Power Distribution Network Infrastructure/System Installation and Maintenance Level IV	
Unit Title	Manage Continuous Improvement System
Unit Code	<a href="#">EIS DNI4 34 1012</a>
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to sustain and develop an environment in which continuous improvement, innovation and learning are promoted and rewarded.

Elements	Performance Criteria
1. Review programs, systems and processes	1.1 Establish strategies to monitor and evaluate performance of key systems and processes 1.2 Undertake detailed analyses of supply chains, operational and product/service delivery systems 1.3 Identify performance measures, and assessment tools and techniques, and evaluate their effectiveness 1.4 Analyze performance reports and variance from plans for all key result areas of the organization 1.5 Identify and analyze changing trends and opportunities relevant to the organization 1.6 Seek advice from specialists, where appropriate, to identify technology and electronic commerce opportunities
2. Develop options for continuous improvement	2.1 Brief groups on performance improvement strategies and innovation as an essential element of competition 2.2 Foster <b>creative climate</b> and <b>organizational learning</b> through the promotion of interaction within and between work groups 2.3 Encourage, test and recognize new ideas and entrepreneurial behavior where successful 2.4 Accept failure of an idea during trialing, and recognize, celebrate and embed success into systems 2.5 Undertake <b>risk management</b> and <b>cost benefit analyses</b> for each option/idea approved for trial 2.6 Approve innovations through agreed organizational processes
3. Implement innovative processes	3.1 Promote continuous improvement as an essential part of doing business 3.2 Address impact of change and consequences for people, and implement transition plans 3.3 Ensure objectives, timeframes, measures and communication plans are in place to manage



	<p>implementation</p> <p>3.4 Implement contingency plans in the event of non-performance</p> <p>3.5 Follow-up failure by prompt investigation and analysis of causes</p> <p>3.6 Manage emerging challenges and opportunities effectively</p> <p>3.7 Evaluate continuous improvement systems and processes regularly</p> <p>3.8 Communicate costs and benefits of innovations and improvements to all relevant groups and individuals</p>
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Variable	Range
Sustainability may include:	<ul style="list-style-type: none"> <li>• addressing environmental and resource sustainability initiatives, such as environmental management systems, action plans, green office programs, surveys and audits</li> <li>• applying the waste management hierarchy in the workplace</li> <li>• complying with regulations and corporate social responsibility considerations for sustainability to enhance the organisation's standing in business and community environments</li> <li>• determining organisation's most appropriate waste treatment, including waste to landfill, recycling, re-use, recoverable resources and wastewater treatment</li> <li>• implementing ecological footprint</li> <li>• implementing environmental management systems, e.g. ISO 14001:1996 Environmental management systems life cycle analyses</li> <li>• implementing government initiatives,</li> <li>• improving resource and energy efficiency</li> <li>• initiating and maintaining appropriate organisational procedures for operational energy consumption</li> <li>• introducing a green office program - a cultural change program</li> <li>• introducing green purchasing</li> <li>• introducing national and international reporting initiatives,</li> <li>• introducing product stewardship</li> <li>• reducing emissions of greenhouse gases</li> <li>• reducing use of non-renewable resources</li> <li>• referencing standards, guidelines and approaches, such as sustainability covenants and compacts or triple bottom line reporting</li> <li>• supporting sustainable supply chain.</li> </ul>
Supply chains include:	<ul style="list-style-type: none"> <li>• network of facilities that procures raw materials, transforms them into intermediate products or services and then finished goods or service, and delivers them through a</li> </ul>

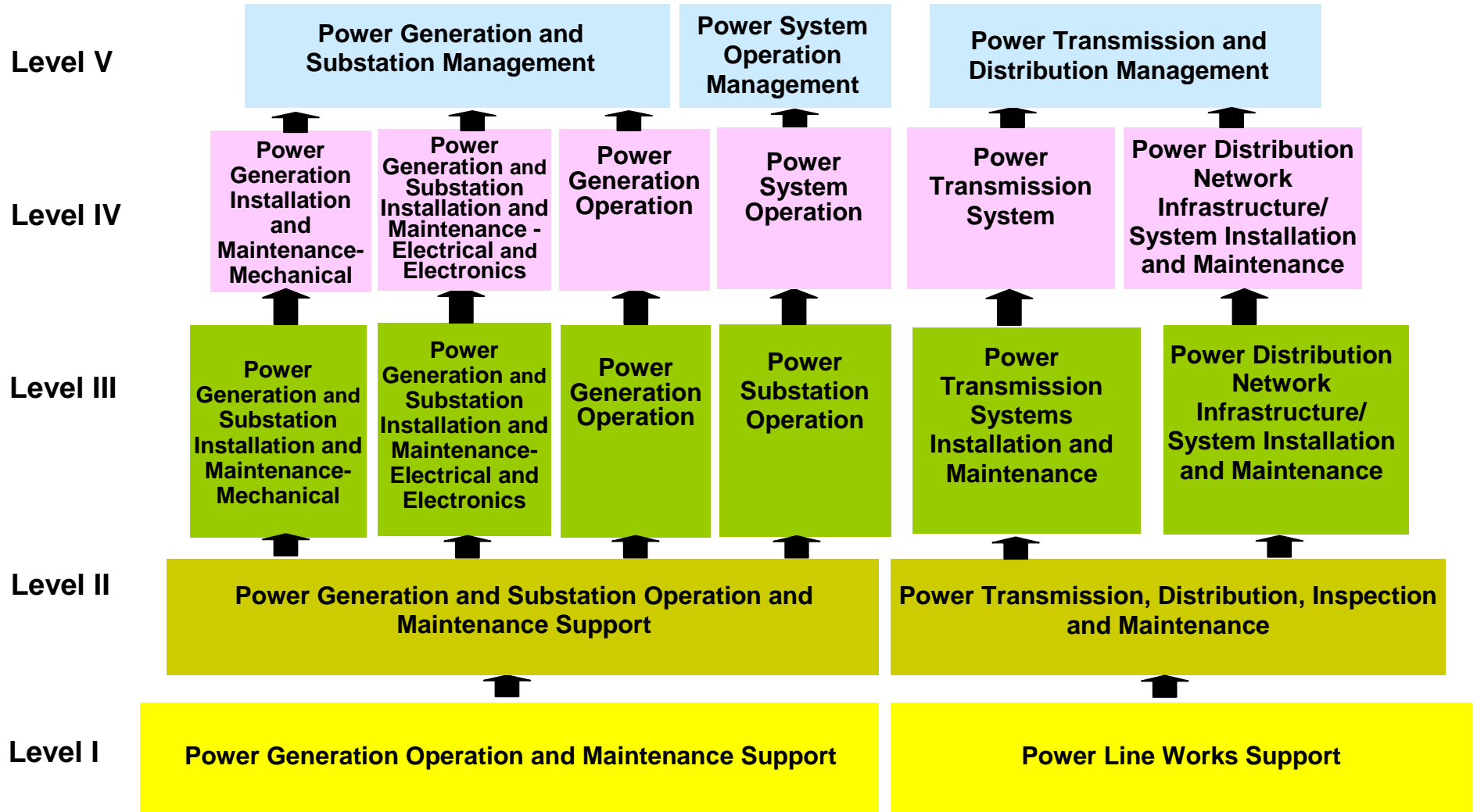
	<p>distribution system</p> <ul style="list-style-type: none"> <li>• procurement, production and distribution, viewed as interlinked not as discrete elements</li> </ul>
Performance reports may include:	<ul style="list-style-type: none"> <li>• budget or cost variance</li> <li>• customer service</li> <li>• environmental</li> <li>• financial</li> <li>• OHS</li> <li>• quality</li> <li>• other operating parameters</li> </ul>

<b>Evidence Guide</b>	
Critical Aspects of Competence	<p>Evidence of the following is essential:</p> <ul style="list-style-type: none"> <li>• demonstration of consultation processes to introduce or evaluate an existing continuous improvement process or system, including suggested actions or an action plan</li> <li>• generation of an idea or concept which exhibits creative thinking and which offers the possibility of advantaging the organization</li> <li>• how the concept or idea was introduced, tested and evaluated - the idea or concept does not have to have been shown to work or to be adopted by the business</li> <li>• knowledge of quality management and continuous improvement theories</li> </ul>
Underpinning Knowledge and Attitudes	<p>Demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>• quality management and continuous improvement theories</li> <li>• creativity/innovation theories/concepts</li> <li>• risk management</li> <li>• cost-benefit analysis methods</li> <li>• creativity and innovation theories and concepts</li> <li>• organizational learning principles</li> <li>• quality management and continuous improvement theories</li> <li>• risk management</li> <li>• sustainability practices</li> </ul>
Underpinning Skills	<p>Demonstrates skills to:</p> <ul style="list-style-type: none"> <li>• analytical skills to identify improvement opportunities in relation to</li> <li>• the services/products delivered or concepts/ideas developed</li> <li>• flexibility and creativity skills to think laterally</li> <li>• leadership skills to foster a commitment to quality and an openness to innovation</li> <li>• teamwork and leadership skills to foster a commitment to quality and an openness to innovation</li> </ul>
Resources Implication	<p>Access may be required to:</p> <ul style="list-style-type: none"> <li>• workplace procedures and plans relevant to work area</li> </ul>

	<ul style="list-style-type: none"> <li>• appropriate documentation and resources normally used in the workplace</li> </ul>
Methods of Assessment	<p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> <li>• demonstration in the workplace</li> <li>• suitable simulation</li> <li>• oral or written questioning to assess knowledge of principles and techniques associated with change management</li> <li>• evaluation of strategies established to monitor and evaluate performance of key systems and processes</li> <li>• review of briefing of groups on performance improvement strategies and innovation</li> </ul> <p>Those aspects of competence dealing with improvement processes could be assessed by the use of suitable simulations and/or a pilot plant and/or a range of case studies and scenarios.</p> <p>In all cases, practical assessment should be supported by questions to assess essential knowledge and those aspects of competence which are difficult to assess directly.</p>
Context of Assessment	Competence may be assessed in the work place or in a simulated workplace setting / environment.

**Sector: Economic Infrastructure**

**Sub-Sector: Power Generation, Transmission and Distribution**



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

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