Australian Government

Department of Education, Employment and Workplace Relations

UETTDRIS47A Sample, test, filter and reinstate insulating oil

Release: 1

UETTDRIS47A Sample, test, filter and reinstate insulating oil

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the filtering, sampling, testing and reinstating of insulating oil. This may include the dispatching of oil samples to a laboratory for higher level testing if required. Post operational servicing of equipment and or plant and, the identification of any related environment issues concerning disposal, safety and the like are also associated with this unit.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit requires a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training.

License to practice **3)**

Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed plus all the competencies in one (1) of the identified Pathway Unit Group(s):

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. Circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEE137A	Document and apply measures to control OHS risks associated with electrotechnology work
UEENEEG006A	Solve problems in single and three phase low voltage machines
UEENEEG101A	Solve problems in electromagnetic

Prerequisite Unit(s) **4)**

	devices and related circuits
UEENEEG102A	Solve problems in electromagnetic devices and related circuits
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits
UEENEEK142A	Apply environmentally and sustainable energy procedures in the energy sector
UETTDREL16A	Working safely near live electrical apparatus

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 "Literacy and Numeracy"

Reading 3 Writing 4 Numeracy 4

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT		PERFORMANCE CRITERIA	
1	Prepare to sample, test, filter and reinstating insulating oil	1.1	Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.
		1.2	Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.
		1.3	OHS policies and procedures related to requirements and established procedures for sampling, testing, filtering and reinstating insulating oil are obtained and confirmed for the purposes of the work to be performed and communicated.
		1.4	Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
		1.5	Hazards are identified, OHS and environmental risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
		1.6	Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.
		1.7	Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.

ELEMENT	PERFORMANCE CRITERIA	
	1.8	Relevant personnel at worksite are confirmed current in rescue, release, CPR, pole top rescue and other related work procedures according to requirements.
	1.9	Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
	1.10	Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures.
	1.11	Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.
	1.12	Traffic management plan is identified and implemented.
2 Carry out sampling, testing, filtering and reinstating of insulating oil	2.1	OHS, sustainable energy and environmental principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.
	2.2	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
	2.3	Lifting, climbing, working in confined spaces and aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.
	2.4	Essential knowledge and associated skills are applied for the safe sampling, testing, filtering and reinstating of insulating oil are applied to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste

ELEMENT	PERFORMANCE CRITERIA	
		according to requirements.
	2.5	Sampling, testing, filtering and reinstating of the insulating oil is carried out, in accordance with the work schedule and to requirements and or established procedures.
	2.6	Unplanned events in the filtering, sampling and testing of insulating oil are undertaken within the scope of established procedures.
	2.7	Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.
	2.8	Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
3 Complete the sampling, testing, filtering and reinstating of insulating oil	3.1	Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.
	3.2	Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.
	3.3	Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.
	3.4	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage or disposed of in accordance with established procedures.
	3.5	Relevant work permit(s) are signed off and, equipment is returned to service in accordance with requirements.
	3.6	Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of sampling, testing, filtering and reinstatement of insulating oil.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TIS47A Insulating oil - sample, test, filter

Evidence shall show an understanding of the sampling, testing and filtering insulating oil to an extent indicated by the following aspects:

T1 Filtering and sampling of insulating oil encompassing:

- Standards, codes, legislation, supply authority regulations and or enterprise requirements associated with filtering and sampling such as - safe handling procedures, personal hygiene, storage and disposal procedures, Occupational Health and Safety hazards and precautions including use of appropriate personal protective equipment, environmental procedures, effects of contaminates.
- Properties of insulating oil - dielectric strength, moisture content, acidity, sludge.
- Locations where insulating oil is used - transformer, switchgear and oil filled cable.
- Filtering equipment – types, cleaning procedures, method of use.
- Techniques in filtering and sampling insulating oil - methods of sampling, methods of filtering, testing procedures on site, analysing oil effectiveness.
- Frequency of testing

T2 Testing of insulating oil encompassing:

- Standards, codes, legislation, supply authority regulations and or enterprise requirements associated with testing such as - precautions during testing, types of testing equipment,
- Techniques in testing insulating oil - electric strength, water content, dielectric dissipation, resistivity, acidity
- Brief introduction to Dissolved Gas Analysis(DGA)

T3 Powerline safety practices encompassing:

- Protective apparatus and apparel for linework - responsibilities for the selection, use, maintenance and storage of protective apparatus and apparel and the types of protective apparatus and apparel used for the line worker
- Requirements for the use of ladders - carrying, erecting, collapsing and lowering different types of extension ladder against a standing pole, maintenance checks on different types of ladders, renewal of extension ropes and the safety issues relating to clearances from overhead conductors
- Requirements for climbing and working aloft - methods used to identify a pole is safe to climb, methods used to inspect a line worker’s body belt, application of

REQUIRED SKILLS AND KNOWLEDGE

knots and hitches appropriate to the requirements of a line worker, height safety principles including personal fall protection, prevention and related requirements, and the practical procedure of climbing an overhead structure and fitting a pole chair

- Traffic management - purpose of traffic management and a line worker's responsibilities in accordance with relevant statutory requirements and electricity supply industry requirements, demonstration of the procedure used to provide an effective traffic management scheme and the use of a two-way radio
- Control of small fires - identification, selection and operation of the appropriate extinguishing mediums for various types of fires, general fire prevention methods and the precautions for personal protection when fighting small fires
- Rescue victims from heights and confined spaces - planning, identifying, the procedures, and establishing responses, developing techniques, involvement of external emergency services and practical demonstration/rehearsals of rescuing a person from heights and from confined spaces and emergency procedures for the rescue of an electric shock victim including CPR
- Requirements for aerial linework - planning, establishing and implementing relevant aviation authority clearances, determining system requirements, aircrew familiarisation with network operations and equipment, requirements for effective communications operations for aerial work.

T4 Material handling and the environment encompassing:

- Methods of obtaining updated environmental information and data sheets on the proper use and handling of equipment and materials
- Environmental standards, codes, environmental legislation, OHS legislation, hazardous substances/dangerous goods regulations, supply authority regulations and or enterprise requirements applicable environmental care when handling materials including provision of manufacturers and suppliers information such as material safety data sheets (MSDS)
- Types and application of personal protective equipment used for hazards substances
- Types and application of personal protective equipment used for hazards substances and dangerous goods
- Techniques in handling equipment to eliminate/reduce risks to the environment from spillages of oils, herbicides, pesticides and chemicals from such equipment - vehicle loading crane, chainsaw, enterprise vehicles, explosive power tools
- Procedures for handling and control of spillages of herbicides
- Methods of disposing and storage of herbicides, pesticides and chemicals
- Methods of cleaning mobile plant, equipment and tools
- Recording of data

T5 Environmental issues when undertaking sampling and filtering of oil encompassing:

- Environmental standards, codes, environmental legislation, supply authority regulations and or enterprise requirements applicable to the work to be undertaken

REQUIRED SKILLS AND KNOWLEDGE

- Methods of obtaining updated environmental information and data sheets on the proper use and handling of oil used on transformers and switchgear including provision of MSDS
- Techniques in filtering and sampling oil to eliminate/reduce risks to the environment from spillages
- Safety procedures and equipment for handling and control of the oil
- Methods of disposing and storage of the oil
- Methods of cleaning equipment, tools and equipment
- Emergency procedures for spillages of oil to reduce risks to the environment - methods of cleaning up excessive spillages, methods of protection to surrounding environment, procedure for notification of relevant personnel and authorities, recording procedures.
- PCB contamination, handling and disposal procedures

T6 Safe handling and/or disposing of insulation materials used in power distribution devices, which are potential environmental pollutants encompassing:

- Standards, codes, Commonwealth, State/Territory and local government legislation, supply authority regulations and or enterprise requirements applicable to the handling and disposing of insulation or heat dissipation materials used in power distribution devices
- Identification of environmental issues associated with the handling and disposing of insulation materials
- Safety precautions when handling and disposing of heat dissipation materials
- Safe working practices
- Occupational Health and Safety hazards and precautions
- Identification of hazards, assessing and controlling risks
- Types, selection, maintenance and uses of personnel protective equipment
- Permit to work systems and isolation procedures
- Types and function of specialised equipment
- Safe working practices when using specialised equipment
- Emergency response and rescue including First Aid etc
- Techniques in the handling and disposing of insulation materials - Polychlorinated Bi-Phenyls (PCB’s), asbestos, insulating Oil, SF6 gas.

T7 Enterprise specific — policy and procedure instructions encompassing:

- Responsibilities and duty of care of employer and employee relationship
- Methods of obtaining the up-to-date information on enterprise policy and procedures
- Rules and regulations
- Induction into workplace - location of work area and storage area, timetable, uniform, personal well-being, housekeeping rules, emergency procedures, evacuation procedures
- Techniques when deal with others - working in teams, customer relation,

REQUIRED SKILLS AND KNOWLEDGE

complaint and issues procedures.

- Overview of enterprise professional development - fire fighting procedures, fatigue management, training and competency development - understanding and promotion

T8 Enterprises specific — OHS instructions encompassing:

- Standards, codes, legislation, supply authority regulations and specific enterprise regulations pertaining to the OHS policies and procedures
- Methods of obtaining the up-to-date information on enterprise OHS policy and procedures
- Specific enterprise personal protection equipment - type and application, where and when to be used, method of replacement, responsibility of maintenance including cleaning inspection and testing, emergency response, rescue, evacuation and First Aid procedures
- Personal well-being – hygiene, fatigue/stress management, drugs/alcohol
- OHS training - induction training, specific hazard training, specific task or equipment training, emergency and evacuation training, training as part of broader programs such as equipment operation
- OHS records including audits, inspection reports, workplace health and environmental monitoring records, training and instruction records, manufacturers and suppliers information such as MSDSs, registers, maintenance reports, workers compensation and rehabilitation records and First Aid/medical records

T9 Enterprises specific — technical drawing and documents encompassing:

- Types and application of enterprise specific drawings and documents - electrical and electronic drawings, mechanical drawings, project charts, schedules, graphs, technical manuals and catalogues
- Instruction/worksheets sheets - types and application of enterprise specific symbols and diagrams
- Title box - description of parts and version control

T10 Enterprises specific specialised tools encompassing:

- Legislation, Standards, codes, legislation, supply authority regulations and specific enterprise regulations pertaining to the use and care of specialised tools - voltage detectors; polarity testers, phase rotation.
- Characteristics, capabilities and application of specialised tools for a particular job
- Safety policies, procedures and precautions with regards to using, transporting and storage of specialised tools
- Selection methods for obtaining the correct specialised tool for the particular job including during procurement, purchasing and or hiring arrangements
- Techniques in pre-use inspection on the serviceability of specialised tools
- Techniques in the selection, use, maintenance, and care and storage of specialised tools
- Identifying OHS hazards, assessing and controlling risks associated with their use

REQUIRED SKILLS AND KNOWLEDGE

- Techniques for the safe use of specialised power tools

T11 Substation safety practices encompassing:

- Standards, codes, Commonwealth, State/Territory/local government legislation, supply authority regulations and or enterprise requirements pertaining to substation safety practices
- Techniques in the use of protective apparatus and apparel for substations work, including responsibilities with regard to the use and maintenance of protective apparatus and apparel and the types of protective apparatus and apparel used for work in substations
- Requirements for the use of ladders and appropriate ladder types for work in substations - safe work methods when carrying, erecting, collapsing and lowering different types of extension ladder against substation structures, plant and equipment, maintenance checks on different types of ladders, renewal of extension ropes and the safety issues relating to clearances from energised conductors
- Requirements for climbing and working at heights in substations - attached climbing principles, selection, use and operation of elevated work platforms and any OHS requirements associated with the use of EWPs
- Control of small fires - identification, selection and operation of the appropriate extinguishing mediums for various types of fires and the precautions for personal protection when fighting small fires
- Control of oil spills - identification, use and maintenance of spill oil control equipment and materials, oil containment facilities and systems
- Rescue and release procedures - rescue personnel from energised conductors, emergency descent from an EWP and may include rescue from confined spaces
- Enterprise requirements - safe access and Authorisation to Work procedures, use of mobile extendable equipment on or near energised HV conductors, emergency response procedures, hazards associated with work in substations including earthing systems, transfer potentials, step and touch effects, electrostatic and electromagnetic induction, dangers of near approach to energised conductors.

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the Performance Criteria and the range statement of the unit of competency and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit **9.2)**

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and range; and
  - Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
  - Demonstrate an appropriate level of employability skills; and
- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
  - Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to be**	**Item List**

	demonstrated	
A	At least two of the following:	Tx Main Tank. Tx Tap Changer Switchgear Cable Reactor
B	At least one occasion:	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual sampling, testing, filtering and reinstatement of insulating oils.

In addition to the resources listed above, in Context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment **9.4)**

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this Competency Standard Unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the filtering, sampling and testing of transformers, switchgear and cable insulating oil and may include tests for dielectric strength and moisture.

Equipment may include (pump) filter press, hoses, pipes, soil kits, sample bottles, storage vessels etc.

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation
- Confined space
- Diagnostic, testing and restoration
- Documenting detail work events, record keeping and or storage of information
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work

RANGE STATEMENT

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

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Industry Specific Cross-Discipline Units