	• pens, pencils, notepaper, soft rubber eraser • scientific calculator Casio fx-100AU PLUS • USB memory Stick
Assessment feedback, review or appeals	Your teacher will provide feedback no later than three (3) weeks after all assessment activities have been conducted. If you would like to request a review of your results or if you have any concerns about your results, contact your teacher or head teacher. You will have three weeks from the date you receive your results in which to make an appeal and request a review. You will receive a response within **ten working days** after receipt of the request. Your Head Teacher will address the appeal in accordance with Assessment Guidelines for TAFE NSW.
Assessment guidelines	You must submit assessment work and attended scheduled assessments on the required dates. • **If you miss an assessment** you must discuss the issue of the missed assessment with your teacher within seven days, or at your first class attendance after the assessment, whichever occurs first. • **If you miss an exam**, or arrive late by more than 30 minutes after the commencement of the exam, due to illness or circumstances beyond your control, you should contact the teacher of this unit. • **If you are deemed unsatisfactory in an assessment event** you will be eligible to receive one (1) additional reattempt to demonstrate competence. Speak to your teacher for further information. • . • **If you engage in cheating** such as copying, colluding with another person, using unauthorised notes, or allowing another person to copy your work, you will be liable for disciplinary action as per Student Discipline Policy - Whatever the form of assessment, it is essential that the work you are assessed on is your own. To validate the authenticity of your submitted work it may be checked used anti plagiarism software in addition it may be stored for future plagiarism checking. We provide learners with every reasonable opportunity to have their work assessed and where possible each case of learner absence from an assessment will be considered on an individual basis. However, where there are no extenuating circumstances, the following penalties apply: • where the results of the unit are recorded in marks, when the assessment is up to seven days late the result achieved by the learner is reduced by 15% • when the assessment is more than seven days late, the result recorded is recorded as "not yet competent" • for non-attendance at an assessment on a negotiated date, the result is recorded as "not yet competent".
Assessment: reasonable adjustments	If you are a student with a disability it is important for you to indicate this on your enrolment form and make contact with the Teacher / Consultant for Students with a Disability in your Institute for further information. If possible, this should happen before you enrol. They will provide you with appropriate information about the range of units available. Teachers and teacher consultants will arrange for students with a disability to be given reasonable adjustment in assessment on an individual needs basis. Teachers may make reasonable allowances for the learners, based on the evidence provided, in accordance with the Assessment Policy - This may relate to the timeframe for submitting/attempting the assessment task or to an alternative form of assessment evidence to be used for assessing the learner's level of achievement.

Teacher Contact Details		

Student Assessment Guide (Unit of Competency)
(Streamlined Training Package)

Faculty	C.E.T.	**College**	
Teaching Section	Electrical Engineering		
Qualification Number and Name	Advanced Diploma of Electrical Engineering Advanced Diploma of Engineering Technology - Electrical Advanced Diploma of Engineering Technology - Electronics		
Unit of Competency Number and Name	UETTDRIS71A Diagnose and rectify faults in electrical energy supply transmission systems		
Application	This unit covers diagnosing and rectifying faults in electrical energy transmission systems. The unit encompasses safe working practices, interpreting diagrams and technical data, applying knowledge of energy supply and transmission systems to logical fault finding processes, implementing fault rectification, safety and functional testing and reporting work activities and outcomes. . .		
Prerequisites	Granting competency in this unit shall be made only after competency in the following unit(s) or their superseded units in UEE20 Training Package as per mapping table http://www.highlightcomputer.com/UEE11-20Mapping.pdf has/have been confirmed. 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 UEENEEG101A — Solve problems in electromagnetic devices and related circuits UEENEEG102A — Solve problems in low voltage a.c. Circuits UEENEEG006A — Solve problems in single and three phase low voltage machines UEENEEG106A — Terminate cables, cords and accessories for low voltage circuits UETTDRIS67A Solve problems in energy supply network equipme UETTDRIS68A Solve problems in energy supply network protection equipment and systems UETTDRIS69A Diagnose and rectify faults in energy supply apparatus		
Licensing,	1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and		

	lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation. 2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.
Required Knowledge & Skills	You will be assessed to prove your competence in the required skills and knowledge below: . KS01-TIS71A Electrical power system transmission faults Evidence shall show an understanding of electrical power system transmission faults to an extent indicated by the following aspects: T1 Overview of the transmission system including lines, buses, transformers and cables. Line/bus layouts including single and double switching, breaker and a half systems and HV crossing methods. T2 The principles involved in high voltage a.c. transmission including tower types and configurations, choice of towers or poles (economic and environmental), insulator types and configuration, types of conductors, their configuration and standard nomenclature. Typical line spacing and ground clearances. Line ratings based on ambient temperature. Conductor terminating and clamping equipment including vibration damping principles and equipment. T3 The principles involved in d.c. transmission including the economics, harmonic generation, VAR requirements and protection difficulties. Types of connections and transformer requirements. Advantages and disadvantages of d.c. transmission. Typical overseas systems. Likely (future) use in this country. T4 The principles of operation, voltage and current range, breaking capacity and field of use of the following types of circuit breakers. □ bulk oil □ small oil volume □ air break □ air blast □ air puffer □ vacuum and □ SF6 (double pressure and puffer types). T5 The types of isolators in use. Examples include duo-roll, blade and scissor type. T6 Circuit breaker auxiliary systems including: □ high pressure air systems and air storage and handling processes □ d.c. systems including battery types, charging and protection systems and earth fault detection systems □ SF6 conditioning, storage and handling system T7 The characteristics of lines and cables including the calculation of R, X and B for different arrangements of conductor. Typical values for actual lines. Transposition. Models based on line length. Voltage and line regulation. The transmission of power (P) and VARs (Q). T8 Control of voltage. Conditions leading to voltage collapse and system disintegration. Effects on the system of high/low volts. Voltage control devices including: □ voltage regulators applied to generators and synchronous phase modifiers □ electromagnetic voltage regulators □ series and parallel capacitors □ OLTC transformers and static Var compensations (SVCs) T9 Range of devices covered by SVCs including: □ saturated reactor compensations (SRs) □ thyristor controlled reactor compensators (TCRs) □ combined TCR/TSCs and □ production of wave-form distorting harmonics and control devices T10 Importance of the location in the system of voltage control devices T11 Use of graphical methods to calculate the size of VAr regulating plant T12 Types of communication systems including telephone, power line carrier, dedicated cable, micro-wave links and fibre optics. Quantities and signals to be communicated. Advantages and disadvantages of the various systems. Equipment requirements
Required Knowledge & Skills	

	T13 Transient over-voltages in power systems. Switching and lightning overvoltages and their effect on different plant items. Transient over-voltage control and reduction using surge diverters, shield wires and CB are control. Insulation systems, insulation co-ordination, insulation grading in plant items, bushings and capacitor bushings T14 Factors leading to the generation of corona. Consequences of corona. Reduction of corona including conductor bundling, grading rings and conductor surface treatment

Assessment criteria	Before the critical aspects of evidence are considered all prerequisites must 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 - UEE07'. Evidence shall also comprise:
	
	• A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
	  • Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
	  • Apply sustainable energy principles and practices as specified in the performance criteria and range statement
	  • Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
	  • Demonstrate an appropriate level of skills enabling employment
	  • Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures.
	• Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
	  • Applying OHS practices in the workplace as described in 8) and including:
	  a. Preparing to enter the workplace including, the use of work permits and clearances and isolation permissions.Planning estimation work effectively.
	  b. Understanding and following risk control safe work methods.
	  c. Applying work procedures and instructions as they apply to risk control measures.
	  d. Dealing with accidents and emergencies within the scope of responsibility.

e. Participation in consultation processes, identifying hazards and implementing and monitoring control measures.

Dealing with unplanned events

Assessment methods & schedule

Assessment of this Learning Specification will be based on the evidence that you provide using 2 or more of the following, as prescribed by your local Institute/ College teaching staff:

- Observation of skills in practical exercises and
- Questioning of knowledge using pen and paper tests, essays, oral tests and/or interviews

You will be required to complete all assessments for this unit to demonstrate your competence in this unit.

Sufficient evidence must be collected, using local assessment methods/tools identified in the Assessment Table below to demonstrate both the student's:

1. ***Successful Performance of the Competency***, by meeting the requirements in the Work Performance Specification, and an

2. ***Understanding of the required skills and knowledge)***, by meeting the requirements in the Learning Specification/s.

Assessment event no.	Assessment Name/ Method	Assessment date	Assessment duration	Assessment venue	Assessment outcome
1	Practical Test				Satisfactory/Not yet satisfactory
2	Theory Exam				Satisfactory/Not yet satisfactory

Reporting assessment outcomes

Your Transcript of Academic Record lists all of your results in your study to date.

"This is an ungraded unit; therefore your academic result will be recorded and reported to you as ***Competent*** **(AC)** or ***Not Yet Competent*** **(NC)**".

If you achieved competency in this unit but are unable to finish the qualification, you will receive a Transcript of Academic Record showing only the units you completed. A **Statement of Attainment** for the unit/units you have successfully completed will also be provided. Please contact the Head Teacher to initiate this process.

Recognition and credit transfers: you can apply to have your previous study, work and/or life experiences recognised. Recognition of Prior Learning will be determined according to TAFE NSW Recognition Policy.

Please see Recognition for previous learning and experience for further information.

Resources required for assessments

This unit is assessed using specific resources/tools:

Learner Resource Manual

Students don't need to purchase any Learner Resource Manual :

Principal References

It is advised that students have access to the following reference books as the main references:

- Generation, Transmission and Utilization of Electrical Power By AT Starr
- Basic Training Manual 16-12 Electrical Trades-Cable, conduits, busbar
- Trades-Cable, conduits, busbar Some components of Learning outcome 3

	• Electrical Distribution Engineering (2nd Ed) by Anthony j Pansini, The Fairmont Press Inc 1991 • Electrical Power Distribution & Transmission by Luceson Faulkenberry & walter Coffer , Prentice Hall, 1996 • Electrical Power Transmission System-By R Robert Eata & Edward Cohen , Prentice Hall, 1972 • Site Surveying & Levelling By John Clancy + Internet downloaded article-Software package for line route survey • +Transmission line mechanical design • Electrical Power Transmission System-By R Robert Eata & Edward Cohen , Prentice Hall, 1972 • Arts & Science of Protective Relaying By Stevenson • Power Protection Course Notes from various Technological Universities Australian Standards AS 1026, 1023, 1034, 1042,1078,1117,1158,1190,1202, 1220,1222,1243, 1284, 1359,1360,1469,1531,1675,1680,1746,1767,1768,1798,1824,1883,1930,1931, 2005,2006,2184,2209,2263,2264,2326,2374,2421,3000,3116,3274 You will also be provided with • Access to a simulated environment containing information similar to that which you may encounter in a workplace. • Access to computer systems for real time assessments sufficient to enable participation in the assessment process. **Other Resources** To complete this unit successfully you should bring the following equipment to class with you: • pens, pencils, notepaper, soft rubber eraser • scientific calculator Casio fx-100AU PLUS • USB memory Stick
Assessment feedback, review or appeals	Your teacher will provide feedback no later than three (3) weeks after all assessment activities have been conducted. If you would like to request a review of your results or if you have any concerns about your results, contact your teacher or head teacher. You will have three weeks from the date you receive your results in which to make an appeal and request a review. You will receive a response within **ten working days** after receipt of the request. Your Head Teacher will address the appeal in accordance with Assessment Guidelines for TAFE NSW.
Assessment guidelines	You must submit assessment work and attended scheduled assessments on the required dates. • **If you miss an assessment** you must discuss the issue of the missed assessment with your teacher within seven days, or at your first class attendance after the assessment, whichever occurs first. • **If you miss an exam**, or arrive late by more than 30 minutes after the commencement of the exam, due to illness or circumstances beyond your control, you should contact the teacher of this unit. • **If you are deemed unsatisfactory in an assessment event** you will be eligible to receive one (1) additional reattempt to demonstrate competence. Speak to your teacher for further information. • . • **If you engage in cheating** such as copying, colluding with another person, using unauthorised notes, or allowing another person to copy your work, you will be liable

	for disciplinary action as per Student Discipline Policy - Whatever the form of assessment, it is essential that the work you are assessed on is your own. To validate the authenticity of your submitted work it may be checked used anti plagiarism software in addition it may be stored for future plagiarism checking. TAFE NSW provides learners with every reasonable opportunity to have their work assessed and where possible each case of learner absence from an assessment will be considered on an individual basis. However, where there are no extenuating circumstances, the following penalties apply: • where the results of the unit are recorded in marks, when the assessment is up to seven days late the result achieved by the learner is reduced by 15% • when the assessment is more than seven days late, the result recorded is recorded as "not yet competent" • for non-attendance at an assessment on a negotiated date, the result is recorded as "not yet competent". .
Assessment: reasonable adjustments	If you are a student with a disability it is important for you to indicate this on your enrolment form and make contact with the Teacher / Consultant for Students with a Disability in your Institute for further information. If possible, this should happen before you enrol. They will provide you with appropriate information about the range of units available. Teachers and teacher consultants will arrange for students with a disability to be given reasonable adjustment in assessment on an individual needs basis. Teachers may make reasonable allowances for the learners, based on the evidence provided, in accordance with the Assessment Policy - This may relate to the timeframe for submitting/attempting the assessment task or to an alternative form of assessment evidence to be used for assessing the learner's level of achievement.

Teacher Contact Details		

Student Assessment Guide (Unit of Competency)
(Streamlined Training Package)

Faculty	C.E.T.	**College**	
Teaching Section	Electrical Engineering		
Qualification Number and Name	Advanced Diploma of Electrical Engineering Advanced Diploma of Engineering Technology - Electrical Advanced Diploma of Engineering Technology - Electronics		
Unit of Competency Number and Name	UETTDRIS73A Develop engineering solutions for energy supply power transformer problems		
Application	This unit covers diagnosing and rectifying faults in electrical energy transmission systems. The unit encompasses safe working practices, interpreting diagrams and technical data, applying knowledge of energy supply and transmission systems to logical fault finding processes, implementing fault rectification, safety and functional testing and reporting work activities and outcomes. . .		
Prerequisites	Granting competency in this unit shall be made only after competency in the following unit(s) or their superseded units in UEE20 Training Package as per mapping table http://www.highlightcomputer.com/UEE11-20Mapping.pdf has/have been confirmed. 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 UEENEEG101A — Solve problems in electromagnetic devices and related circuits UEENEEG102A — Solve problems in low voltage a.c. Circuits UEENEEG006A — Solve problems in single and three phase low voltage machines UEENEEG106A — Terminate cables, cords and accessories for low voltage circuits UETTDRIS67A Solve problems in energy supply network equipme UETTDRIS68A Solve problems in energy supply network protection equipment and systems UETTDRIS69A Diagnose and rectify faults in energy supply apparatus UETTDRIS71A Diagnose and rectify faults in electrical energy supply transmission systems		
Licensing,	1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder		

	operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation. 2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.
Required Knowledge & Skills	You will be assessed to prove your competence in the required skills and knowledge below: . KS01-TIS73A Power transformers diagnostics Evidence shall show an understanding of power transformers to an extent indicated by the following aspects: T1 Transformer construction and operating principles encompassing: □ various types of lamination style and core construction used in single phase, three phase, double wound and auto transformers. □ different winding styles/types used in transformers. □ how input current is limited on no load and how power is transferred from primary to secondary when a load is connected. □ using the transformation ratio to determine an unknown quantity of V, I, VA. □ significance of nameplate data items. □ operation of a transformer under load/no load conditions. □ the reason any particular type of transformer is used in a specific application. □ safety features specified in regulatory standards with respect to transformers. □ safety features specified in regulatory standards with respect to isolating transformers. □ basic insulation resistance, continuity and winding identification tests. T2 Transformer parameters encompassing: □ the percentage impedance of a transformer by test. □ percentage impedance of a transformer by calculation. □ the equivalent circuit of a transformer. □ calculation of voltage regulation. □ losses that occur in a transformer. □ tests to determine losses. □ efficiency and state typical values. □ the all day efficiency of a transformer. T3 Cooling methods encompassing: □ methods of natural and forced cooling. □ properties of transformer oil. □ tests performed on transformer oil. □ auxiliary equipment □ the purpose and operation of the types of auxiliary equipment used on transformers - bushings, explosion vents, surge diverters, tap changers, conservator, breathers and desiccants, gas relays, temperature indicators.
Required Knowledge & Skills	T4 Instrument transformers encompassing: □ construction of current transformers. □ uses and ratings of current transformers. □ construction of voltage transformers. □ uses and ratings of voltage transformers. □ safety techniques when using instrument transformers. T5 Transformer connections encompassing: □ vector group of a transformer from a connection diagram. □ connections of a three-phase transformer to create a particular vector group. □ reasons for using the different vector groups. □ purpose of tertiary windings. □ consequences/effect of an incorrect connection T6 Parallel operation encompassing: □ polarity markings for the windings of a transformer.

	conditions/restrictions for parallel operation of transformers. calculation of loading on transformers operating in parallel. connection of transformers in parallel to supply a common load. the consequences/effect of an incorrect connection. T7 Harmonics in transformers encompassing: how harmonics are generated in transformers. problems caused by harmonics in transformers. measurement of the harmonics in a transformer. methods/equipment used to overcome harmonics in transformers. T8 High voltage isolation encompassing: the term high voltage. procedures for isolating high voltage apparatus. regulations with respect to access permits. clearances to be observed with respect to high voltages up to 33 kV. the term 'step' and 'touch' potential.

Assessment criteria	Before the critical aspects of evidence are considered all prerequisites must 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 - UEE07'. Evidence shall also comprise:
	
	• A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
	  • Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
	  • Apply sustainable energy principles and practices as specified in the performance criteria and range statement
	  • Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
	  • Demonstrate an appropriate level of skills enabling employment
	  • Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures.
	• Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
	  • Applying OHS practices in the workplace as described in 8) and including:
	  a. Preparing to enter the workplace including, the use of work permits and clearances and isolation permissions.Planning estimation work effectively.
	  b. Understanding and following risk control safe work methods.
	  c. Applying work procedures and instructions as they apply to risk control measures.
	  d. Dealing with accidents and emergencies within the scope of responsibility.
	  e. Participation in consultation processes, identifying hazards and implementing and monitoring control measures.
	Dealing with unplanned events

Assessment methods & schedule	Assessment of this Learning Specification will be based on the evidence that you provide using 2 or more of the following, as prescribed by your local Institute/ College teaching staff: • Observation of skills in practical exercises and

- Questioning of knowledge using pen and paper tests, essays, oral tests and/or interviews

You will be required to complete all assessments for this unit to demonstrate your competence in this unit.

Sufficient evidence must be collected, using local assessment methods/tools identified in the Assessment Table below to demonstrate both the student's:

1. ***Successful Performance of the Competency***, by meeting the requirements in the Work Performance Specification, and an

2. ***Understanding of the required skills and knowledge*** by meeting the requirements in the Learning Specification/s.

Assessment event no.	Assessment Name/ Method	Assessment date	Assessment duration	Assessment venue	Assessment outcome
1	Practical Test				Satisfactory/Not yet satisfactory
2	Theory Exam				Satisfactory/Not yet satisfactory

Reporting assessment outcomes

Your Transcript of Academic Record lists all of your results in your study to date.

"This is an ungraded unit; therefore your academic result will be recorded and reported to you as ***Competent*** **(AC)** or ***Not Yet Competent*** **(NC)**".

If you achieved competency in this unit but are unable to finish the qualification, you will receive a Transcript of Academic Record showing only the units you completed. A **Statement of Attainment** for the unit/units you have successfully completed will also be provided. Please contact the Head Teacher to initiate this process.

Recognition and credit transfers: you can apply to have your previous study, work and/or life experiences recognised. Recognition of Prior Learning will be determined according to Recognition Policy.

Please see Recognition for previous learning and experience - E for further information.

Resources required for assessments

This unit is assessed using specific resources/tools:

Learner Resource Manual

Students don't need to purchase any Learner Resource Manual :

Principal References

It is advised that students have access to the following reference books as the main references:

- Electrical Machines, Drives & Power Transformers
- TAFE NSW Module Resources Power Transformer
- Generation, Transmission and Utilization of Electrical Power By AT Starr
- Basic Training Manual 16-12 Electrical Trades-Cable, conduits, busbar
- Trades-Cable, conduits, busbar Some components of Learning outcome 3
- Electrical Distribution Engineering (2nd Ed) by Anthony j Pansini, The Fairmont Press Inc 1991
- Electrical Power Distribution & Transmission by Luceson Faulkenberry & walter Coffer , Prentice Hall, 1996
- Electrical Power Transmission System-By R Robert Eata & Edward Cohen , Prentice Hall, 1972

	• Site Surveying & Levelling By John Clancy + Internet downloaded article-Software package for line route survey • +Transmission line mechanical design • Electrical Power Transmission System-By R Robert Eata & Edward Cohen , Prentice Hall, 1972 • Arts & Science of Protective Relaying By Stevenson • Power Protection Course Notes from various Technological Universities Australian Standards AS 1026, 1023, 1034, 1042,1078,1117,1158,1190,1202, 1220,1222,1243, 1284, 1359,1360,1469,1531,1675,1680,1746,1767,1768,1798,1824,1883,1930,1931, 2005,2006,2184,2209,2263,2264,2326,2374,2421,3000,3116,3274 You will also be provided with • Access to a simulated environment containing information similar to that which you may encounter in a workplace. • Access to computer systems for real time assessments sufficient to enable participation in the assessment process. **Other Resources** To complete this unit successfully you should bring the following equipment to class with you: • pens, pencils, notepaper, soft rubber eraser • scientific calculator Casio fx-100AU PLUS • USB memory Stick
Assessment feedback, review or appeals	Your teacher will provide feedback no later than three (3) weeks after all assessment activities have been conducted. If you would like to request a review of your results or if you have any concerns about your results, contact your teacher or head teacher. You will have three weeks from the date you receive your results in which to make an appeal and request a review. You will receive a response within **ten working days** after receipt of the request. Your Head Teacher will address the appeal in accordance with Assessment Guidelines for TAFE NSW.
Assessment guidelines	You must submit assessment work and attended scheduled assessments on the required dates. • **If you miss an assessment** you must discuss the issue of the missed assessment with your teacher within seven days, or at your first class attendance after the assessment, whichever occurs first. • **If you miss an exam**, or arrive late by more than 30 minutes after the commencement of the exam, due to illness or circumstances beyond your control, you should contact the teacher of this unit. • **If you are deemed unsatisfactory in an assessment event** you will be eligible to receive one (1) additional reattempt to demonstrate competence. Speak to your teacher for further information. • **If you engage in cheating** such as copying, colluding with another person, using unauthorised notes, or allowing another person to copy your work, you will be liable for disciplinary action as per Student Discipline Policy - Whatever the form of assessment, it is essential that the work you are assessed on is your own. To validate the authenticity of your submitted work it may be checked used anti plagiarism software in addition it may be stored for future plagiarism checking. We provide learners with every reasonable opportunity to have their work assessed and where possible each case of learner absence from an assessment will be

	considered on an individual basis. However, where there are no extenuating circumstances, the following penalties apply: • where the results of the unit are recorded in marks, when the assessment is up to seven days late the result achieved by the learner is reduced by 15% • when the assessment is more than seven days late, the result recorded is recorded as "not yet competent" • for non-attendance at an assessment on a negotiated date, the result is recorded as "not yet competent".
Assessment: reasonable adjustments	If you are a student with a disability it is important for you to indicate this on your enrolment form and make contact with the Teacher / Consultant for Students with a Disability in your Institute for further information. If possible, this should happen before you enrol. They will provide you with appropriate information about the range of units available. Teachers and teacher consultants will arrange for students with a disability to be given reasonable adjustment in assessment on an individual needs basis. Teachers may make reasonable allowances for the learners, based on the evidence provided, in accordance with the Assessment Policy - This may relate to the timeframe for submitting/attempting the assessment task or to an alternative form of assessment evidence to be used for assessing the learner's level of achievement.

Teacher Contact Details		

Student Assessment Guide (Unit of Competency)
(Streamlined Training Package)

Faculty	C.E.T.	**College**	
Teaching Section	Electrical Engineering		
Qualification Number and Name	Advanced Diploma of Electrical Engineering Advanced Diploma of Engineering Technology - Electrical Advanced Diploma of Engineering Technology - Electronics		
Unit of Competency Number and Name	UETTDRIS74A Develop engineering solutions for energy supply system protection problems		
Application	This unit covers diagnosing and rectifying faults in electrical energy transmission systems. The unit encompasses safe working practices, interpreting diagrams and technical data, applying knowledge of energy supply and transmission systems to logical fault finding processes, implementing fault rectification, safety and functional testing and reporting work activities and outcomes. . .		
Prerequisites	Granting competency in this unit shall be made only after competency in the following unit(s) or their superseded units in UEE20 Training Package as per mapping table http://www.highlightcomputer.com/UEE11-20Mapping.pdf has/have been confirmed. 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 UEENEEG101A — Solve problems in electromagnetic devices and related circuits UEENEEG102A — Solve problems in low voltage a.c. Circuits UEENEEG006A — Solve problems in single and three phase low voltage machines UEENEEG106A — Terminate cables, cords and accessories for low voltage circuits UETTDRIS67A Solve problems in energy supply network equipme UETTDRIS68A Solve problems in energy supply network protection equipment and systems UETTDRIS69A Diagnose and rectify faults in energy supply apparatus UETTDRIS71A Diagnose and rectify faults in electrical energy supply transmission systems		
Licensing,	1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder		

	operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation. 2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.
Required Knowledge & Skills	You will be assessed to prove your competence in the required skills and knowledge below: . KS01-TIS74A Electrical power system protection diagnostic Evidence shall show an understanding of diagnosing faults in electrical power system protection to an extent indicated by the following aspects: T1 Protection scheme requirements encompassing: □ Requirements of a protection scheme - relationship to primary system design, purpose of protection, safety of persons, protection of plant, system instability, system break up, loss of customers, loss of revenue, protection zones, restricted schemes, unrestricted schemes, duplicate protection, local backup protection, remote backup protection, selectivity, discrimination, stability, sensitivity, reliability □ Components of a protection scheme - current transformers, potential transformers, summation current transformers, interposing transformers, multi-tapped transformers, all-or-nothing relays, induction relays, balanced beam relays, directional relays, biased relays, solid state relays, microprocessor based relays, gas relays, thermal sensors, hardwired communication, powerline carriers systems, microwave systems, fibre optic systems, need for isolation, need for interfacing □ Protection applied to buses - overload, differential, earth leakage, structure leakage, combined schemes, protection overlap □ Protection applied to transformers - biased differential, gas, winding temperature, oil temperature □ Protection applied to single/radial lines - overcurrent, earth leakage, slow earth leakage, distance, auto reclose, sectionalising, over voltage □ Protection applied to interconnected lines - overcurrent, pilot wire, directional, directional overcurrent, current differential, phase comparison, current comparison, distance, impedance, admittance, offset T2 Discrete protection systems encompassing: □ Earth fault protection - master earth leakage schemes, sensitive earth fault relays and schemes, residual earth fault scheme, core balance earth fault scheme, frame/structure earth leakage scheme, time graded discrimination, backup protection □ Overcurrent protection - feeder overcurrent protection, instantaneous overcurrent schemes, inverse timed overcurrent schemes, types and location of components of an overcurrent scheme, CT summation, time graded discrimination, backup protection
Required Knowledge & Skills	Alarms and controls - auxiliary relays, voltage regulating relays, line drop compensation, gas relay types, gas relay scheme operation and setting, over temperature schemes T3 Interdependent protection systems encompassing: □ Overcurrent and earth leakage intertripping, interlocking and blocking - logic mapping, master control, electromechanical, electronic, shading coils □ Pilot wire, phase comparison - opposed voltage schemes, circulating current schemes, location of components of a scheme, pilot supervisory techniques, □ Load shedding, voltage control, parallel operation, load rejection □ CB failure protection □ Reclose systems - applications, single shot, multishot, blocking schemes, synchronisation checking T4 Complex protection systems encompassing: □ Distance - characteristics, electromechanical, electronic, impedance, mho, offset mho, switched schemes, non-switched schemes, blocking schemes, bus zone

	Differential, transformer differential, bus overcurrent - principles, feeder protection, transformer protection, bias systems, harmonic restraint, CT connections, bus protection, low impedance schemes, high impedance schemes, bus overcurrent schemes, generator protection, CT connections, special considerations, digital systems Types of revenue metering Applications of SCADA Complex protection systems for communications Harmonic control Point on wave switching

Assessment criteria	Before the critical aspects of evidence are considered all prerequisites must 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 - UEE07'. Evidence shall also comprise:
	
	• A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
	  • Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
	  • Apply sustainable energy principles and practices as specified in the performance criteria and range statement
	  • Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
	  • Demonstrate an appropriate level of skills enabling employment
	  • Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures.
	• Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
	  • Applying OHS practices in the workplace as described in 8) and including:
	  a. Preparing to enter the workplace including, the use of work permits and clearances and isolation permissions.Planning estimation work effectively.

b. Understanding and following risk control safe work methods.
c. Applying work procedures and instructions as they apply to risk control measures.
d. Dealing with accidents and emergencies within the scope of responsibility.
e. Participation in consultation processes, identifying hazards and implementing and monitoring control measures.

Dealing with unplanned events

Assessment methods & schedule

Assessment of this Learning Specification will be based on the evidence that you provide using 2 or more of the following, as prescribed by your local Institute/ College teaching staff:

- Observation of skills in practical exercises and
- Questioning of knowledge using pen and paper tests, essays, oral tests and/or interviews

You will be required to complete all assessments for this unit to demonstrate your competence in this unit.

Sufficient evidence must be collected, using local assessment methods/tools identified in the Assessment Table below to demonstrate both the student's:

1. ***Successful Performance of the Competency***, by meeting the requirements in the Work Performance Specification, and an

2. ***Understanding of the required skills and knowledge*** by meeting the requirements in the Learning Specification/s.

Assessment event no.	Assessment Name/ Method	Assessment date	Assessment duration	Assessment venue	Assessment outcome
1	Practical Test				Satisfactory/Not yet satisfactory
2	Theory Exam				Satisfactory/Not yet satisfactory

Reporting assessment outcomes

Your Transcript of Academic Record lists all of your results in your study to date.

"This is an ungraded unit; therefore your academic result will be recorded and reported to you as ***Competent*** **(AC)** or ***Not Yet Competent*** **(NC)**".

If you achieved competency in this unit but are unable to finish the qualification, you will receive a Transcript of Academic Record showing only the units you completed. A **Statement of Attainment** for the unit/units you have successfully completed will also be provided. Please contact the Head Teacher to initiate this process.

Recognition and credit transfers: you can apply to have your previous study, work and/or life experiences recognised. Recognition of Prior Learning will be determined according to Recognition Policy.

Please see Recognition for previous learning and experience -E for further information.

Resources required for assessments

This unit is assessed using specific resources/tools:

Learner Resource Manual

Students don't need to purchase any Learner Resource Manual :

Principal References

It is advised that students have access to the following reference books as the main references:

	• TAFE NSW Module Resources Power System Protection • Generation, Transmission and Utilization of Electrical Power By AT Starr • Basic Training Manual 16-12 Electrical Trades-Cable, conduits, busbar • Trades-Cable, conduits, busbar Some components of Learning outcome 3 • Electrical Distribution Engineering (2nd Ed) by Anthony j Pansini, The Fairmont Press Inc 1991 • Electrical Power Distribution & Transmission by Luceson Faulkenberry & walter Coffer , Prentice Hall, 1996 • Electrical Power Transmission System-By R Robert Eata & Edward Cohen , Prentice Hall, 1972 • Site Surveying & Levelling By John Clancy + Internet downloaded article-Software package for line route survey • +Transmission line mechanical design • Electrical Power Transmission System-By R Robert Eata & Edward Cohen , Prentice Hall, 1972 • Arts & Science of Protective Relaying By Stevenson • Power Protection Course Notes from various Technological Universities Australian Standards AS 1026, 1023, 1034, 1042,1078,1117,1158,1190,1202, 1220,1222,1243, 1284, 1359,1360,1469,1531,1675,1680,1746,1767,1768,1798,1824,1883,1930,1931, 2005,2006,2184,2209,2263,2264,2326,2374,2421,3000,3116,3274 You will also be provided with • Access to a simulated environment containing information similar to that which you may encounter in a workplace. • Access to computer systems for real time assessments sufficient to enable participation in the assessment process. **Other Resources** To complete this unit successfully you should bring the following equipment to class with you: • pens, pencils, notepaper, soft rubber eraser • scientific calculator Casio fx-100AU PLUS • USB memory Stick
Assessment feedback, review or appeals	Your teacher will provide feedback no later than three (3) weeks after all assessment activities have been conducted. If you would like to request a review of your results or if you have any concerns about your results, contact your teacher or head teacher. You will have three weeks from the date you receive your results in which to make an appeal and request a review. You will receive a response within **ten working days** after receipt of the request. Your Head Teacher will address the appeal in accordance with Assessment Guidelines for TAFE NSW.
Assessment guidelines	You must submit assessment work and attended scheduled assessments on the required dates. • **If you miss an assessment** you must discuss the issue of the missed assessment with your teacher within seven days, or at your first class attendance after the assessment, whichever occurs first. • **If you miss an exam**, or arrive late by more than 30 minutes after the commencement of the exam, due to illness or circumstances beyond your control, you should contact the teacher of this unit.

	• **If you are deemed unsatisfactory in an assessment event** you will be eligible to receive one (1) additional reattempt to demonstrate competence. Speak to your teacher for further information. • **If you engage in cheating** such as copying, colluding with another person, using unauthorised notes, or allowing another person to copy your work, you will be liable for disciplinary action as per Student Discipline Policy - Whatever the form of assessment, it is essential that the work you are assessed on is your own. To validate the authenticity of your submitted work it may be checked used anti plagiarism software in addition it may be stored for future plagiarism checking. We provide learners with every reasonable opportunity to have their work assessed and where possible each case of learner absence from an assessment will be considered on an individual basis. However, where there are no extenuating circumstances, the following penalties apply: • where the results of the unit are recorded in marks, when the assessment is up to seven days late the result achieved by the learner is reduced by 15% • when the assessment is more than seven days late, the result recorded is recorded as "not yet competent" • for non-attendance at an assessment on a negotiated date, the result is recorded as "not yet competent". .
Assessment: reasonable adjustments	If you are a student with a disability it is important for you to indicate this on your enrolment form and make contact with the Teacher / Consultant for Students with a Disability in your Institute for further information. If possible, this should happen before you enrol. They will provide you with appropriate information about the range of units available. Teachers and teacher consultants will arrange for students with a disability to be given reasonable adjustment in assessment on an individual needs basis. Teachers may make reasonable allowances for the learners, based on the evidence provided, in accordance with the Assessment Policy - This may relate to the timeframe for submitting/attempting the assessment task or to an alternative form of assessment evidence to be used for assessing the learner's level of achievement.

Teacher Contact Details		

Student Assessment Guide (Unit of Competency)
(Streamlined Training Package)

Faculty	C.E.T.	**College**	
Teaching Section	Electrical Engineering		
Qualification Number and Name	Advanced Diploma of Engineering Technology - Electrical Advanced Diploma of Electrical Engineering Advanced Diploma of Engineering Technology - Electronics		
Unit of Competency Number and Name	UEERE0013 Sustainability in the Energy Sector		
Application	This unit covers developing strategies to address environmental and sustainability issues in the energy sector. It encompasses working safely, apply extensive knowledge of sustainable energy systems and components and their operating parameters, gathering and analysing data, applying problem solving techniques, developing and documenting alternatives solutions.		
Prerequisites	None **Literary and Numeracy:** 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"		
Licensing, Legislative or Certification requirements	None		
Required Skills & Knowledge	All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies. You will be assessed to prove your competence in the required skills and knowledge below: **Sustainability in the Energy Sector** Evidence shall show an understanding of greenhouse reduction strategies to an extent indicated by the following aspects: T1 Principles of sustainability encompassing: • ways in which ecosystems moderate climate. • ways in which ecosystems purify and store water. • ways in which ecosystems recycle waste. T2 Problems in a sustainable world encompassing: • changes to Australian forest cover since white settlement, and the resulting loss of ecosystem and human benefits. • changes to Australia's soils since white settlement, and the resulting loss of ecosystem and human benefits. • changes to Australia's waterways since white settlement, and the resulting loss of ecosystem and human benefits. • place of environmental accounting in quantifying Australia's environmental losses. • limits to Australia's population carrying capacity. T3 Sustainability principles encompassing: • principles within sustainability including: environmental accounting and economies; full cost pricing; triple bottom line ethic; ecologically sustainable development; greenhouse		

Required Skills & Knowledge	gas abatement; energy efficiency; resource and water use efficiency; life cycle costing; renewable energy substitution, cleaner production; waste minimisation, reuse and recycling ecological footprint. T4 Addressing the problem of global warming encompassing: • greenhouse gases and their sources and quantities that contribute to global warming • global warming impacts for Australia for 2030 and 2070 predicted by CSIRO modelling. • requirements to achieve stable atmospheric concentrations of greenhouse gases. • ecologically and economically sustainable methods for achieving these stable concentrations. T5 Greenhouse gas emissions profile encompassing: • goals and principles of the National Greenhouse Strategy • what a greenhouse gas inventory is, why it is required, and the sectors to which it applies • uses to which the National Greenhouse Gas Inventory can be applied. T6 Understanding and communicating climate change and its impacts encompassing: • the possible impact of climate change in Australia. • techniques for improving the understanding of climate change • techniques for communicating to and educating the general public on greenhouse gas induced climate change. T7 Partnerships for greenhouse action encompassing: • actions achievable by each level of government to implement the NGS. • methods by which the community activity can be engaged in the reduction of greenhouse gas emissions. • initiatives that can be undertaken by the private sector to reduce greenhouse gas emissions. • advantages of international partnerships. • emissions trading system. T8 Efficient and sustainable energy use and supply encompassing: • techniques for reducing the greenhouse intensity of energy supply. • types of renewable energy sources suitable for use in Australia. • methods and technique for improving end-use efficiency. T9 Efficient transport and sustainable urban planning encompassing: • how integrating land use and transport planning can assist the greenhouse problem. • how each of the following can be used to mitigate greenhouse gas; travel demand and traffic management strategies; encouraging greater use of public transport, walking and cycling; freight and logistics systems; improving vehicle fuel efficiency and fuel technologies T10 Greenhouse sinks and sustainable land management encompassing: • how enhancing greenhouse sinks and encouraging sustainable forestry and vegetation management can complement the AGS. • how greenhouse gas emissions are obtained from agricultural production and describe techniques to mitigate the emissions. T11 Models of greenhouse best practice in industrial processes and waste management encompassing: • types and methods of reducing greenhouse gas emissions from industry. • methods of reducing methane emissions from waste treatment and disposal. T12 Adaptation to climate change encompassing: • salient points in each of the key sectors that require analysis and the strategies required in the need for adaptation to climate change
Assessment criteria	Sufficient evidence must be collected, using local assessment methods/tools identified in the Assessment Table below to demonstrate both the student's: 1. ***Successful Performance of the Competency***, by meeting the requirements in the Work Performance Specification, and an 2. ***Understanding of the required skills and knowledge*** *(**KS01-EE082A**)*, by meeting the requirements in the Learning Specification/s. You will be assessed against the following criteria to establish your competence in the unit: **Event 1:** Assignment 1. A full report based on topics T1 to T7, T10 to T12..

<table>
<tr><td></td><td colspan="6">Event 2: Assignment 2. A full report based on topics T8 and T9.</td></tr>
<tr><td rowspan="3">Assessment methods & schedule</td><td>Assessment event no.</td><td>Assessment Name/ Method</td><td>Assessment date</td><td>Assessment duration</td><td>Assessment venue</td><td>Assessment outcome</td></tr>
<tr><td>1</td><td>Assignment 1</td><td></td><td></td><td></td><td>S/NS</td></tr>
<tr><td>2</td><td>Assignment 2</td><td></td><td></td><td></td><td>S/NS</td></tr>
<tr><td>Reporting assessment outcomes</td><td colspan="6">Your Transcript of Academic Record lists all of your results in your study to date.

"This is an ungraded unit; therefore your academic result will be recorded and reported to you as Competent (AC) or Not Yet Competent (NC)".

If you achieved competency in this unit but are unable to finish the qualification, you will receive a Transcript of Academic Record showing only the units you completed.

A Statement of Attainment for the unit/units you have successfully completed will also be provided. Please contact the Head Teacher to initiate this process.

Recognition and credit transfers: you can apply to have your previous study, work and/or life experiences recognised. Recognition of Prior Learning will be determined according to TAFE NSW Recognition Policy.

Please see Recognition for previous learning and experience - for further information.</td></tr>
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If you would like to request a review of your results or if you have any concerns about your results, contact your teacher or head teacher.

You will have three weeks from the date you receive your results in which to make an appeal and request a review.

You will receive a response within ten working days after receipt of the request.
Your Head Teacher will address the appeal in accordance with Assessment Guidelines for TAFE NSW.</td></tr>
<tr><td>Assessment guidelines</td><td colspan="6">You must submit assessment work and attended scheduled assessments on the required dates.

• If you miss an assessment you must discuss the issue of the missed assessment with your teacher within seven days, or at your first class attendance after the assessment, whichever occurs first.
• If you miss an exam, or arrive late by more than 30 minutes after the commencement of the exam, due to illness or circumstances beyond your control, you should contact the teacher of this unit.
• If you are deemed unsatisfactory in an assessment event you will be eligible to receive one (1) additional reattempt to demonstrate competence. Speak to your teacher for further information.
• If you engage in cheating such as copying, colluding with another person, using unauthorised notes, or allowing another person to copy your work, you will be liable for disciplinary action as per Student Discipline Policy - Whatever the form of assessment, it is essential that the work you are assessed on is your own. To validate</td></tr>
</table>

	the authenticity of your submitted work it may be checked used anti plagiarism software in addition it may be stored for future plagiarism checking. We provide learners with every reasonable opportunity to have their work assessed and where possible each case of learner absence from an assessment will be considered on an individual basis. However, where there are no extenuating circumstances, the following penalties apply: • where the results of the unit are recorded in marks, when the assessment is up to seven days late the result achieved by the learner is reduced by 15% • when the assessment is more than seven days late, the result recorded is recorded as "not yet competent" • for non-attendance at an assessment on a negotiated date, the result is recorded as "not yet competent". .
Assessment: reasonable adjustments	If you are a student with a disability it is important for you to indicate this on your enrolment form and make contact with the Teacher / Consultant for Students with a Disability in your Institute for further information. If possible, this should happen before you enrol. They will provide you with appropriate information about the range of units available. Teachers and teacher consultants will arrange for students with a disability to be given reasonable adjustment in assessment on an individual needs basis. Teachers may make reasonable allowances for the learners, based on the evidence provided, in accordance with the Assessment Policy - This may relate to the timeframe for submitting/attempting the assessment task or to an alternative form of assessment evidence to be used for assessing the learner's level of achievement.

Teacher Contact Details		

Student Assessment Guide (Unit of Competency)
(Streamlined Training Package)

Faculty	C.E.T.	**College**	
Teaching Section	Electrical Engineering		
Qualification Number and Name	- Advanced Diploma of Electrical Engineering - Advanced Diploma of Engineering Technology - Electrical - Advanced Diploma of Engineering Technology - Electronics		
Unit of Competency Number and Name	UEERE0012 Develop effective engineering strategies for energy reduction		
Application	This unit covers evaluating energy used in buildings and developing and documenting strategies/methods to effectively reduce energy use without compromising occupancy standards. It encompasses working safely, setting up and conducting evaluation measurements and evaluating energy use from measured parameters. . . .		
Prerequisites	Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed: UEENEEK132A Develop strategies to address environmental and sustainability issues in the energy sector		
Licensing,	Neither Legislative licensing nor Certification licensing requirements are needed		
Required Knowledge & Skills	You will be assessed to prove your competence in the required skills and knowledge below: . **Energy efficient building design** Evidence shall show an understanding of energy efficient building design to an extent indicated by the following aspects: T1 Climate and thermal comfort encompassing: □ characteristics of the different Australian climatic types. □ use of climatic data in published and electronic forms to extract the quantities relevant to energy efficient design. □ relationship between climate and comfort using bioclimatic or psychrometric charts. □ calculation of heating or cooling degree days or degree hours for various locations. □ calculation of thermal neutrality for a given location. T2 Solar geometry and radiation encompassing: □ definition of the terms: declination, hour angle, zenith angle, azimuth and altitude angles, the equation of time. □ conversion of solar time to local time and vice versa. □ position of the sun and the length of shadows with the aid of algorithms, tables, sun charts or computer software. □ daily irradiation incident on a wall, window or roof of a given tilt and orientation. □ relative summer and winter irradiation of windows facing the cardinal orientations. T3 Heat transfer encompassing: □ thermal processes of conduction, convection and radiation apply to the transfer of heat in buildings.		

Required Knowledge & Skills	□ calculation of the summer and winter U-values of building elements using tables and software. □ calculation of the infiltration heat transfer in a building. T4 Glazing Systems encompassing: □ different types of glazing systems and their characteristics. □ different types of shading devices and the window orientations for which they are most appropriate. □ solar heat gain for different glazing types and angles of incidence □ calculation of the average daily irradiation of a window partly shaded by eaves, using computer software. □ calculation of the average daily heat gain through a window partly shaded by eaves. T5 Insulation encompassing: □ different types of insulation and where they are used. □ how different types of insulation are installed in roofs, walls and floors. □ determination of the minimum R-values of roof insulation for different locations using Australian Standard AS2627 or similar standards. T6 Thermal mass encompassing: □ advantages and disadvantages of using substantial thermal mass in different climate types and for different heating and cooling regimes. □ where thermal mass can be located in a building. □ explain what is meant by the following terms: time lag, decrement factor, admittance, response factor. T7 Comfort control strategies encompassing: □ interpretation of the usefulness of a design strategy with the aid of a psychrometric chart showing control potential zones for a particular location. □ selection of the most useful comfort control strategies for Australian climatic regions. Ενεργψ εφφιχιενχψ ιν βυιλδινγσ ενχομπασσινγ: • determination of the direction of the following: both true and magnetic, north winter and summer sunrise, winter and summer sunset. □ solar access in summer and winter to various possible house locations on a site and room locations within the house. □ how vegetation can be used to both funnel and deflect wind. □ using cross ventilation as a cooling strategy. T9 Thermal performance of a building encompassing: □ heating requirements of a building using the heating degree day or hour method. □ dynamic performance predicted by a computer simulation program such as NatHERS or BERS. Integration of active solar systems encompassing: □ active solar system types available which can provide hot water, space heating and cooling. □ the best location on the roof, and the optimum tilt and orientation of the collector panels. □ function of the main components of an air or water-based solar space heating system.

	schematic of the fluid circuit of an air or water- based space

Assessment criteria	Before the critical aspects of evidence are considered all prerequisites must 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 - UEE07'. Evidence shall also comprise:
	
	• A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
	  • Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
	  • Apply sustainable energy principles and practices as specified in the performance criteria and range statement
	  • Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
	  • Demonstrate an appropriate level of skills enabling employment
	  • Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures.
	• Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
	  • Applying OHS practices in the workplace as described in 8) and including:
	  a. Preparing to enter the workplace including, the use of work permits and clearances and isolation permissions.Planning estimation work effectively.
	  b. Understanding and following risk control safe work methods.
	  c. Applying work procedures and instructions as they apply to risk control measures.
	  d. Dealing with accidents and emergencies within the scope of responsibility.
	  e. Participation in consultation processes, identifying hazards and implementing and monitoring control measures.
	Dealing with unplanned events

Assessment methods & schedule	Assessment of this Learning Specification will be based on the evidence that you provide using 2 or more of the following, as prescribed by your local Institute/ College teaching staff: • Observation of skills in practical exercises and • Questioning of knowledge using pen and paper tests, essays, oral tests and/or interviews You will be required to complete all assessments for this unit to demonstrate your competence in this unit. Sufficient evidence must be collected, using local assessment methods/tools identified in the Assessment Table below to demonstrate both the student's: 1. ***Successful Performance of the Competency***, by meeting the requirements in the Work Performance Specification, and an 2. ***Understanding of the required skills and knowledge)***, by meeting the requirements in the Learning Specification/s.

	Assessment event no.	Assessment Name/ Method	Assessment date	Assessment duration	Assessment venue	Assessment outcome
	1	Practical Test				Satisfactory/Not yet satisfactory
	2	Theory Exam				Satisfactory/Not yet satisfactory
Reporting assessment outcomes	Your Transcript of Academic Record lists all of your results in your study to date. "This is an ungraded unit; therefore your academic result will be recorded and reported to you as ***Competent*** **(AC)** or ***Not Yet Competent*** **(NC)**". If you achieved competency in this unit but are unable to finish the qualification, you will receive a Transcript of Academic Record showing only the units you completed. A **Statement of Attainment** for the unit/units you have successfully completed will also be provided. Please contact the Head Teacher to initiate this process. **Recognition and credit transfers:** you can apply to have your previous study, work and/or life experiences recognised. Recognition of Prior Learning will be determined according to Recognition Policy. Please see Recognition for previous learning and experience -for further information.					
Resources required for assessments	This unit is assessed using specific resources/tools: **Learner Resource Manual** Students don't need to purchase any Learner Resource Manual : **Principal References** It is advised that students have access to the following reference books as the main references: • *Sustainable Solar Housing* • *Solar Thermal Installation* • *Renewable Energy-Power for sustainable Future* • *Solar Engineering of Thermal Process* • *Renewable Energy-Energy Efficient Building Design Resource Book- TAFE-QLD* • *Materials for Engineers & Technician* • *AS4777/AS3000/AS3008* • *Green Energy Council Publications* You will also be provided with • Access to a simulated environment containing information similar to that which you may encounter in a workplace. • Access to computer systems for real time assessments sufficient to enable participation in the assessment process. **Other Resources** To complete this unit successfully you should bring the following equipment to class with you: • pens, pencils, notepaper, soft rubber eraser • scientific calculator Casio fx-100AU PLUS • USB memory Stick					
Assessment feedback, review or appeals	Your teacher will provide feedback no later than three (3) weeks after all assessment activities have been conducted. If you would like to request a review of your results or if you have any concerns about your results, contact your teacher or head teacher.					

	You will have three weeks from the date you receive your results in which to make an appeal and request a review. You will receive a response within **ten working days** after receipt of the request. Your Head Teacher will address the appeal in accordance with Assessment Guidelines for TAFE NSW.
Assessment guidelines	You must submit assessment work and attended scheduled assessments on the required dates. • **If you miss an assessment** you must discuss the issue of the missed assessment with your teacher within seven days, or at your first class attendance after the assessment, whichever occurs first. • **If you miss an exam**, or arrive late by more than 30 minutes after the commencement of the exam, due to illness or circumstances beyond your control, you should contact the teacher of this unit. • **If you are deemed unsatisfactory in an assessment event** you will be eligible to receive one (1) additional reattempt to demonstrate competence. Speak to your teacher for further information. • **If you engage in cheating** such as copying, colluding with another person, using unauthorised notes, or allowing another person to copy your work, you will be liable for disciplinary action as per Student Discipline Policy - Whatever the form of assessment, it is essential that the work you are assessed on is your own. To validate the authenticity of your submitted work it may be checked used anti plagiarism software in addition it may be stored for future plagiarism checking. We provide learners with every reasonable opportunity to have their work assessed and where possible each case of learner absence from an assessment will be considered on an individual basis. However, where there are no extenuating circumstances, the following penalties apply: • where the results of the unit are recorded in marks, when the assessment is up to seven days late the result achieved by the learner is reduced by 15% • when the assessment is more than seven days late, the result recorded is recorded as "not yet competent" • for non-attendance at an assessment on a negotiated date, the result is recorded as "not yet competent".
Assessment: reasonable adjustments	If you are a student with a disability it is important for you to indicate this on your enrolment form and make contact with the Teacher / Consultant for Students with a Disability in your Institute for further information. If possible, this should happen before you enrol. They will provide you with appropriate information about the range of units available. Teachers and teacher consultants will arrange for students with a disability to be given reasonable adjustment in assessment on an individual needs basis. Teachers may make reasonable allowances for the learners, based on the evidence provided, in accordance with the Assessment Policy - This may relate to the timeframe for submitting/attempting the assessment task or to an alternative form of assessment evidence to be used for assessing the learner's level of achievement.

Teacher Contact Details		

PART (6) TRADE ASSESSMENT

UEE30820
Certificate III in Electrotechnology Electrician
Release 6

RPL Kit

RPL Kit

UEE30820 Certificate III in Electrotechnology Electrician

Superior Training Centre RPL Kits have been developed in accordance with training.gov.au and are based on the Superior Training Centre philosophy of providing client focussed, streamlined, and flexible RPL.

Who can apply?

If you can demonstrate that you are adequately trained in a trade, you can apply to Superior Training Centre to have your trade skills recognised. You can do this whether you have gained your trade skills experience in Australia or Overseas.

You must be:
Living in NSW or intending to work in NSW,
Able to provide evidence supporting employment in the full scope of work associated with the trade,
Able to provide evidence to demonstrate how you developed your trade skills and knowledge,

Skills and knowledge you are required to outline

Applicants need to demonstrate both underpinning knowledge and trade skills associated with particular trade vocation.

Underpinning knowledge is a correct understanding of relevant information to ensure a task is performed to acceptable trade practice.

Trade Skills are the ability to perform trade to acceptable trade practice.
This might include the ability to:

- Read and respond to work instructions, specifications, and technical drawings.
- Correctly use and application of products.
- Select use and application of tools and measuring instruments.
- Plan, set out, lay out and undertake work tasks associated with a trade occupation to acceptable trade practice.
- Diagnose and correct faults or undertake repairs to acceptable trade practice.
- Create or produce trade products and services to in accordance with acceptable trade practice.
- Carry out trade work independently.
- Supervise and impart trade skills and knowledge to other staff including apprentices.

HOW TO USE THIS RPL KIT

This RPL Kit is divided into sections to allow you to easily access only those sections you require at any given time. These sections are:

SECTION A – Assessor Information

You need to read this information before conducting an assessment. It outlines the intent and processes surrounding this RPL assessment and how it differs from assessment undertaken following formal training.

SECTION B – Candidate Information and Application Forms

You give this information to the candidate. It tells them about the assessment process as well as containing simple forms for the applicant to fill out. From the information provided by the candidate on these forms, you will be able to gain a general understanding of the skills and experience the candidate may have, as well as potential referee contacts.

SECTION C – Competency Conversation

You use this section to determine and record candidate competence via a competency conversation. In other words, these questions guide your conversation with the applicant and assist in your assessment of their competence. The notes you take about this conversation are important evidence for assessment.

SECTION D – Written Assessments / Exams

Not Included

SECTION E – Practical Tasks and Observation Recording Sheets

You use this section to assess competencies through a practical demonstration of the candidate's skills. It contains practical tasks/scenarios on the outcomes required to determine competency and a place to record your observation. The notes you take are important evidence for assessment.

SECTION F – Resources for Practical Tasks

You use this section to access required resources for performing practical tasks and scenarios.

SECTION G – Third Party Verification

You give this section to the referees to confirm the candidate's skills and experience in this qualification/occupation. The referees may fill out the appropriate form and return to you to confirm your judgement. You may be able to complete this part of evidence gathering in person while at the workplace.

SECTION H – Assessment Tables

You use this table as a reference tool to see at a glance how units/elements of competency are assessed within the tool. All the elements and performance criteria within the competency units are cross matched in this table with a corresponding assessment question/task/scenario. This allows you to validate the assessment process against the qualification.

SECTION I – RPL Outcome and Further Action

In this section, RPL Assessment Outcomes that include Full RPL which have been granted for satisfying all required competency elements and Pending RPL that means RPL is to be granted upon satisfactory completion of additional tasks.

SECTION J – ACTION RECORD

RPL Assessment may be performed by more than one assessor. By recording the completed tasks and the tasks that will be required to finalise the RPL assessment , it will provide more efficient and effective processing of RPL as well as serving as academic action record.

SECTION A

Assessor Information

It is VITAL you read this information prior to commencing your RPL assessment. It provides generic information on assessment, as well as an overview of this streamlined RPL assessment process.

ADVICE FOR ASSESSORS

This RPL Kit streamlines the RPL assessment process for **UEE30820 Certificate III in Electrotechnology Electrician** by taking a practical approach to RPL and increasing the use of on-site questioning and observation. This will assist in developing a "picture of the candidate's skills and knowledge". This picture can then be compared with industry standards enabling a determination of whether the candidate has achieved the required outcomes.

IMPORTANT ASPECTS TO REMEMBER:

A sound knowledge of assessment and the qualification is essential

It is important to have a good understanding of the competencies and qualification/s appropriate to the candidate's goals.

Assessing a single unit of competency is rarely cost or time effective. Where possible, effort should be made to assess several units at the same time taking advantage of any commonality in content. This means looking at the whole picture of a particular job role as it happens in industry and assessing holistically. This saves valuable time in the assessment process.

Assessment involves judgement

This tool encourages the use of a "competency conversation" to maximise the candidate's opportunities to demonstrate competence. This is NOT an oral exam. It is about using the two or three holistic questions provided to start a conversation with the candidate which draws out their actual individual experiences and relevant skills. In other words, it is about the assessor probing the candidate through a conversation to draw out further information on the candidate's experience which may not be forthcoming due to nerves or confusion over technical terminology.

The tool also provides observable tasks to allow candidates to demonstrate skills.

Authentication/verification is integral to RPL assessment

It is critical information gleaned from the interview and observation be confirmed with those who can vouch for the candidate's skill over time. Supervisors would generally perform this role. Authentication may also be done through conversation, but it cannot be stressed enough that it is essential assessors **take careful notes** to back up and record their judgement.

Recording assessment is critical

Keep careful records of all aspects of conversations, skills demonstration or documentation viewed that support the claim of prior learning. Remember – the record is the document that makes sense of the assessment and why a particular judgment was made. Keeping **detailed notes** about the candidate's response is vital, as is the **rationale** for judgement.

The assessment record is a **legal document** and must be signed, dated and stored according to requirements of the State Training Authority.

Employability Skills

Assessment of a candidate's employability skills should be integrated into the assessment of their technical skills and knowledge. Where possible, employability skills have been embedded within the bank of questions and practical assessment tasks in this RPL Kit. Therefore, assessors should make and document holistic judgements about a candidate's attainment of employability skills as part of the RPL assessment. For more information about the employability skills requirements for particular qualifications, refer to the training package.

To access further general information on employability skills, refer to *Employability Skills: From framework to practice*, at:
https://www.voced.edu.au/content/ngv%3A52958

COMPETENCIES IN THIS RPL ASSESSMENT TOOL

UEE30820 Certificate III in Electrotechnology Electrician

This qualification provides individuals with the skills and knowledge to select, install, set up, test, fault find, repair and maintain electrical systems and equipment in buildings and premises. It includes Electrical Regulatory Authority Council (ERAC), or their successor's, Essential Performance Capabilities for an 'Unrestricted Electrician's license'.

The skills and knowledge described in this qualification require a licence or permit to practice in the workplace where work is carried out on electrical installations which are designed to operate at voltages greater than 50 volt (V) alternating current (a.c.) or 120 V direct current (d.c.).

The minimum requirements for achievement of the Certificate III in **Electrotechnology Electrician** are:

- A total of **1,110 weighting points** comprising:
- **990 core weighting points** listed below; plus
- **120 general elective weighting points**.

The following competencies are contained within this RPL Kit:

CORE UNITS

Unit Code	Unit Title	Points	Questions (Verbal / Written)	Practical (Tasks/ Scenario)
HLTAID009	Provide cardiopulmonary resuscitation	10	To develop	To develop
UEECO0023	Participate in electrical work and competency development activities	60	✓	✓
UEECD0007	Apply work health and safety regulations, codes and practices in the workplace	20	✓	✓
UEECD0019	Fabricate, assemble and dismantle utilities industry components	40	✓	✓
UEECD0044	Solve problems in single path circuits	40	✓	✓
UEECD0046	Solve problems in multi path circuits	40	✓	✓
UEECD0020	Fix and secure electrotechnology equipment	20	✓	✓
UEECD0051	Use drawings, diagrams, schedules, standards, codes and specifications	40	✓	✓
UEECD0016	Document and apply measures to control WHS risks associated with electrotechnology work	20	✓	✓
UEEEL0024	Test and connect alternating current (a.c.) rotating machines*	50	✓	✓
UEEEL0025	Test and connect transformers*	30	✓	✓
UEEEL0008	Evaluate and modify low voltage heating equipment and controls*	20	✓	✓
UEEEL0009	Evaluate and modify low voltage lighting circuits, equipment and controls*	20	✓	✓
UEEEL0010	Evaluate and modify low voltage socket outlets circuits*	20	✓	✓
UEEEL0003	Arrange circuits, control and protection for electrical installations*	40	✓	✓
UEEEL0019	Solve problems in direct current (d.c.) machines*	30	✓	✓
UEEEL0021	Solve problems in magnetic and electromagnetic devices*	30	✓	✓
UEEEL0020	Solve problems in low voltage a.c. circuits*	80	✓	✓
UEEEL0012	Install low voltage wiring, appliances, switchgear and associated accessories*	40	✓	✓
UEEEL0047	Identify, shut down and restart systems with alternate supplies*	20	✓	✓
UEEEL0039	Design, install and verify compliance and functionality of general electrical installations*	40	✓	✓
UEEEL0023	Terminate cables, cords and accessories for low voltage circuits*	40	✓	✓
UEEEL0018	Select wiring systems and select cables for low voltage electrical installations*	60	✓	✓
UEEEL0014	Isolate, test and troubleshoot low voltage electrical circuits*	60	✓	✓
UEEEL0005	Develop and connect electrical control circuits*	80	✓	✓
UEERE0001	Apply environmentally and sustainable procedures in the energy sector	20	✓	✓
UETDRRF004	Perform rescue from a live LV panel*	20		
	Total Points in Core Units	**990**		

Group A Electives: Maximum 120 points

Unit Code	Unit Title	Points	Questions (Verbal / Written)	Practical (Tasks/ Scenario)
UEECS0033	Use engineering applications software on personal computers	40	✓	✓
UEEIC0013	Develop, enter and verify discrete control programs for programmable controllers*	60	✓	✓
UEEAS0007	Assemble, mount and connect control gear and switchgear*	40	✓	✓
UEEDV0005	Install and maintain cabling for multiple access to telecommunication services*	80	✓	✓

NOTE: Additional elective units will be added in future revisions of this RPL Kit.

OVERVIEW OF RECOGNITION PROCESS

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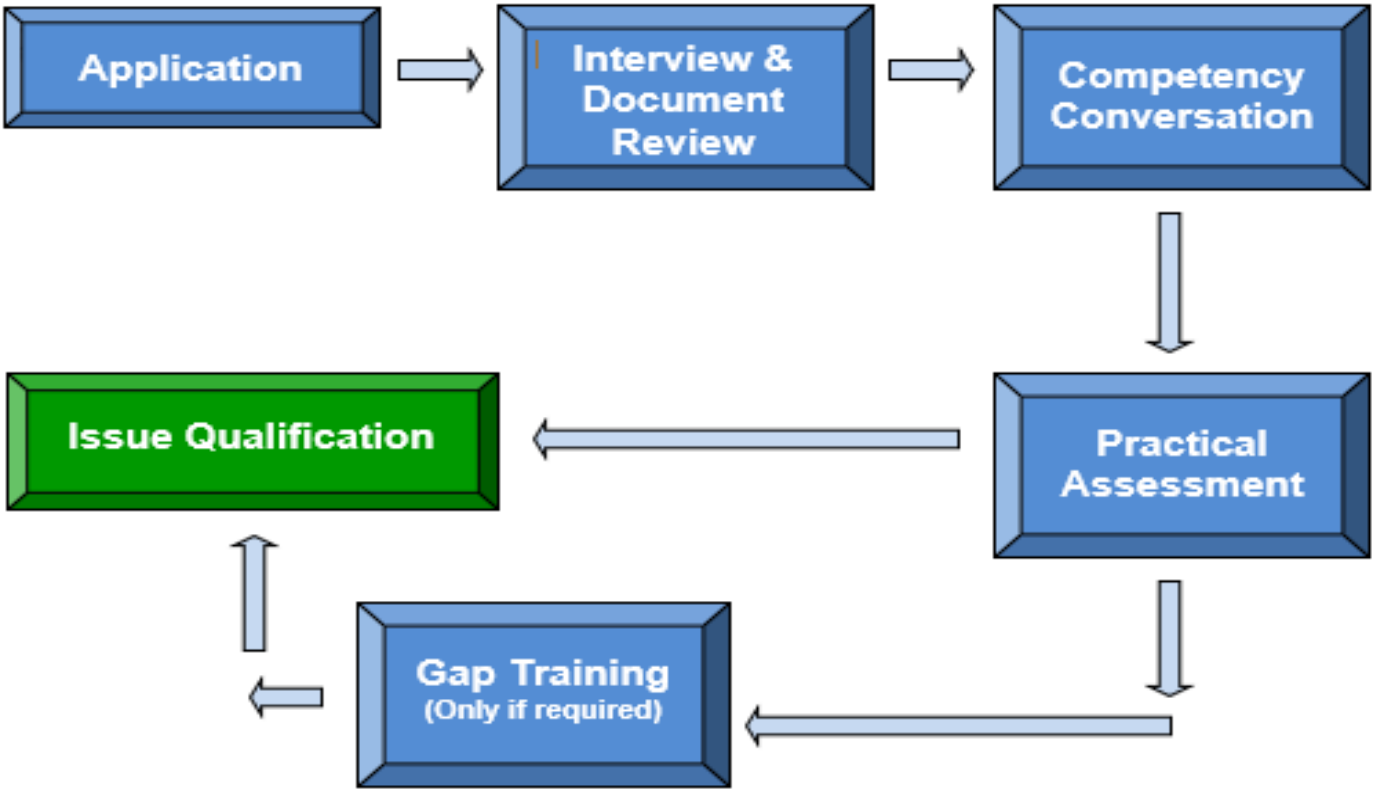
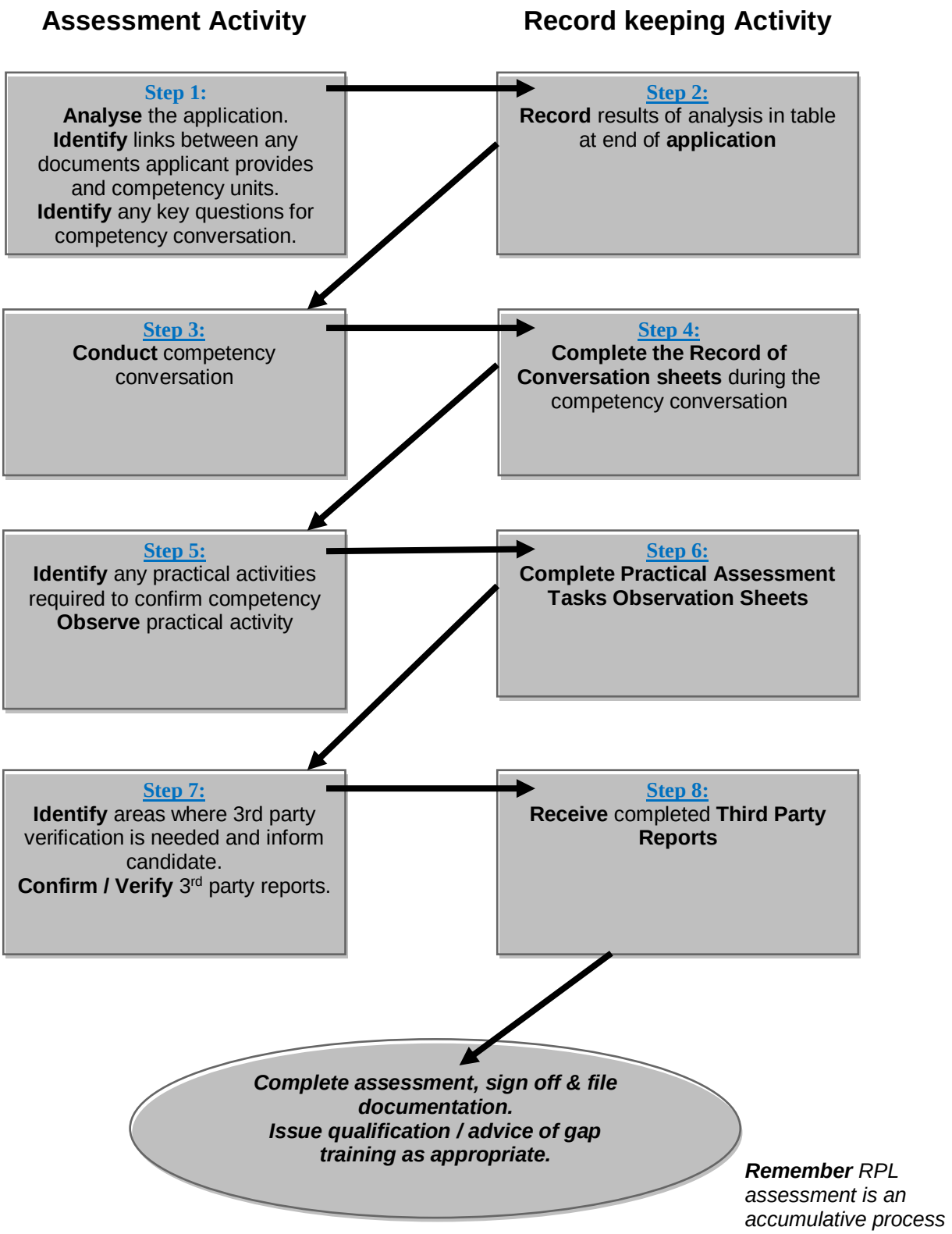
This kit has been developed to streamline the application for recognition of prior learning.



RPL ASSESSMENT PROCESS FLOWCHART FOR ASSESSORS



***Remember** RPL assessment is an accumulative process of collecting evidence.*

STEPS IN THE RPL PROCESS

1. Complete application

The candidate completes the application forms in **SECTION B**. It is important candidates provide as much information of their previous experience in the electrotechnology service industry as is available.

Documents that may be available include but are not limited to:

any licences, e.g., unrestricted/ restricted licence
brief CV/resume of work history
indentures/trade papers
certificates/results of assessment
certificates/results of assessment – interstate/overseas
certificates/results of assessment – universities
results/statement of attendance/certificates – vendor training courses, in-house courses, workshops, seminars, symposiums
results/statements of attendance/certificates – club courses e.g., first aid, surf lifesaving, etc
tickets held e.g., forklift, crane, EWP, etc
site competencies held record – Blue/White card, site safety induction
industry awards
photographs of your own industry work
diaries/task sheets/job sheets/logbooks
site training records
membership of relevant professional associations
hobbies/interests/special skills outside work
references/letters from previous employers/supervisors
any other documentation that may demonstrate industry experience

Candidates also need to provide contact details for one or two referees who can confirm their industry skills in context and over time.

To have skills formally recognised under the Australian Qualifications Framework, you must ensure the candidate's skills meet industry standards.

2. Interview about candidate's documentary information

Review the information provided by the candidate and arrange a time for both you and the candidate to discuss. Begin alignment of documentation and skills to the following qualification:

UEE30820Certificate III in Electrotechnology Electrician

The candidate will have the opportunity to discuss and identify previous experience with you. The available documents are step one in collecting information and you will need to determine which units of competency, if any, are fully covered at this stage. You use your own or your RTO's assessment recording forms to record this stage of the assessment.

There may be instances where the candidate has little, or no, documentary information of industry experience. This is **not** a barrier to gaining recognition. This will just require you to rely on the questioning, practical assessment and referee validation phases of the RPL process.

3. Questions for the Competency Conversation

The bank of questions in **SECTION C** is the next phase in collecting evidence for the RPL process. The questions are designed to enable you to have a "competency conversation" with the candidate to further gain evidence of their past experience. **REMEMBER**, the primary focus is on the candidate's experience.

Each question has "key points" to look for in responses. You may use the list of key points to formulate questions of your own if you wish or contextualise the question to the candidate's particular work situation. The Record of Conversation sheets indicate relevant content (evidence) that should be sought. Place a tick next to each key point as you hear this topic being discussed during the conversation. You should read the "industry requirements" of each competency before the candidate answers the questions posed. You may also target the assessment to those aspects that present the *greatest risk* in the industry. Questions are aligned with the relevant unit/s of competency in **SECTION G**.

It is not intended every question for all competencies is asked, only those competencies the initial interview about the candidate's documentary evidence has failed to **fully** address. The question bank covers most but not all units in the kit. Units without questions are covered in the practical assessment/scenario section.

4. Practical assessment tasks

It is important that you use both Steps 3 (Questioning) and 4 (Practical Assessment) in doing this assessment. The RPL process is a streamlined RPL process which **does not** rely solely on practical assessment but uses a combination of questioning and practical to provide evidence of candidate competence.

This is the third phase in collecting evidence. A practical skills test is then conducted by you at the candidate's workplace or another suitable venue. Appropriate permission must be sought before entering workplaces.

This is a further opportunity for candidate to demonstrate competence. It is expected the practical assessment will comprise **only those competencies** the candidate is still unable to demonstrate knowledge/experience in after documentary review and questioning have been applied. These assessments contain the practical skills and application of knowledge for the qualification. A number of holistic practical assessments are included in this kit (**SECTION D**) to assist you with tasks suitable for observation on the job.

You decide if the response to questions and practical assessment tasks fulfils the requirements of the standard and may choose to pursue the issue further for a determination to be made. The assessment is a conversation/observation, not an exam, and you are encouraged to assist candidates to focus responses on relevant issues.

Assessing through observation and questioning, particularly on the job, will speed up and streamline the RPL assessment process.

NOTE: Where candidate's documentation and responses to key questions contribute to the assessment decision, no judgement on an individual's competence should be made without having direct evidence that confirms knowledge and skills can be applied against the appropriate performance standards. The critical safety nature of working with electricity and electrical equipment carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment and allow a confident decision by the assessor when making a judgement of "competence". Practical assessment will therefore be considered mandatory as

part of the RPL process and in particular will apply to those skills that are more critical to safety and operational requirements.

Recording sheets for candidate information, questioning and the practical assessments have been included in **SECTION D**. You may use other recording mechanisms provided these also keep a complete record of assessment *and justification of judgement*. Candidate responses, observations of skills demonstrated, and documents presented as evidence must be noted in enough detail so anyone external to the process (e.g., a fellow assessor, auditor, lawyer, etc) can read the record and retrace your judgement.

5. Gap training

RPL is an assessment process designed to show areas of competence and to identify and record if a candidate has gaps in skills and knowledge against a whole qualification.

Not all candidates will have skill/knowledge gaps, however it is vital to identify gaps so that training can be targeted to maintain relevance and maximise efficiencies in training that also support development of a safe & competent worker.

If a candidate has skills gaps, a pathway to complete training in the outstanding units can be negotiated to assist the client to gain the full qualification.

EVIDENCE REVIEW

UEE30820 Certificate III in Electrotechnology Electrician

Recognition of prior learning outcomes (both Granted and Not Granted) are now funded nationally and as such will be included in National AVETMISS audits. NCVER have stipulated evidence recording requirements for RPL assessments as a minimum requirement for passing an AVETMISS audit. The following "Evidence Review" proforma has been approved by NCVER as covering AVETMISS audit requirements for RPL recorded outcomes. It also gives you an opportunity to track a student's assessment progress at a glance.

It is expected that this "Evidence Review" summary sheet (or similar) would be attached to each participant's evidence compiled during the RPL assessment process.

(Place a tick in the appropriate evidence collection method column for each unit of competency. Place a line through those units not examined as part of this RPL assessment.)

Unit Code	Unit Title	Questions	Practical	Documents	3rd Party Report	Other evidence
CORE UNITS						
HLTAID009	Provide cardiopulmonary resuscitation					
UEECO0023	Participate in electrical work and competency development activities					
UEECD0007	Apply work health and safety regulations, codes and practices in the workplace					
UEECD0019	Fabricate, assemble and dismantle utilities industry components					
UEECD0044	Solve problems in single path circuits					
UEECD0046	Solve problems in multi path circuits					
UEECD0020	Fix and secure electrotechnology equipment					
UEECD0051	Use drawings, diagrams, schedules, standards, codes and specifications					
UEECD0016	Document and apply measures to control WHS risks associated with electrotechnology work					
UEEEL0024	Test and connect alternating current (a.c.) rotating machines*					
UEEEL0025	Test and connect transformers*					
UEEEL0008	Evaluate and modify low voltage heating equipment and controls*					
UEEEL0009	Evaluate and modify low voltage lighting circuits, equipment and controls*					
UEEEL0010	Evaluate and modify low voltage socket outlets circuits*					
UEEEL0003	Arrange circuits, control and protection for electrical installations*					
UEEEL0019	Solve problems in direct current (d.c.) machines*					
UEEEL0021	Solve problems in magnetic and electromagnetic devices*					
UEEEL0020	Solve problems in low voltage a.c. circuits*					
UEEEL0012	Install low voltage wiring, appliances, switchgear and associated accessories*					
UEEEL0047	Identify, shut down and restart systems with alternate supplies*					

Unit Code	Unit Title	Questions	Practical	Documents	3rd Party Report	Other evidence
UEEEL0039	Design, install and verify compliance and functionality of general electrical installations*					
UEEEL0023	Terminate cables, cords and accessories for low voltage circuits*					
UEEEL0018	Select wiring systems and select cables for low voltage electrical installations*					
UEEEL0014	Isolate, test and troubleshoot low voltage electrical circuits*					
UEEEL0005	Develop and connect electrical control circuits*					
UEERE0001	Apply environmentally and sustainable procedures in the energy sector					
UETDRRF004	Perform rescue from a live LV panel*					
Group A Electives You may complete units to a maximum weighting of 60						
UEECS0033	Use engineering applications software on personal computers					
UEEIC0013	Develop, enter and verify discrete control programs for programmable controllers*					
UEEAS0007	Assemble, mount and connect control gear and switchgear*					
UEEDV0005	Install and maintain cabling for multiple access to telecommunication services*					

Assessor's Name: _____

Assessor's Signature:_____

Date: _____

SECTION B

Candidate Information and Application Forms

You give this information to the candidate for them to read about the RPL process and to complete the appropriate forms.

WHAT DOES IT MEAN TO BE RECOGNISED AS AN ELECTROTECHNOLOGY ELECTRICIAN

An **Electrotechnology Electrician** will have recognised skills and knowledge (competencies) to to select, install, set up, test, fault find, repair and maintain electrical systems and equipment in buildings and premises. It includes Electrical Regulatory Authority Council (ERAC), or their successor's, Essential Performance Capabilities for an 'Unrestricted Electrician's license' which permits to practice in the workplace where work is carried out on electrical installations which are designed to operate at voltages greater than 50 volt (V) alternating current (a.c.) or 120 V direct current (d.c.).

An Electrician will have the skills and knowledge to perform the following tasks and duties to the standard of performance expected in the workplace:

- ✓ Provide cardiopulmonary resuscitation
- ✓ Apply work health and safety regulations, codes and practices in the workplace
- ✓ Document and apply measures to control WHS risks associated with electrotechnology work*
- ✓ Fabricate, assemble and dismantle utilities industry components*
- ✓ Fix and secure electrotechnology equipment
- ✓ Solve problems in multiple path circuits
- ✓ Solve problems in single path circuits
- ✓ Use drawings, diagrams, schedules, standards, codes and specifications*
- ✓ Participate in electrical work and competency development activities
- ✓ Arrange circuits, control and protection for electrical installations*
- ✓ Develop and connect electrical control circuits*
- ✓ Evaluate and modify low voltage heating equipment and controls*
- ✓ Evaluate and modify low voltage lighting circuits, equipment and controls*
- ✓ Evaluate and modify low voltage socket outlets circuits*
- ✓ Install low voltage wiring, appliances, switchgear and associated accessories*
- ✓ Isolate, test and troubleshoot low voltage electrical circuits*
- ✓ Select wiring systems and select cables for low voltage electrical installations*
- ✓ Solve problems in direct current (d.c.) machines*
- ✓ Solve problems in low voltage a.c. circuits
- ✓ Solve problems in magnetic and electromagnetic devices*
- ✓ Terminate cables, cords and accessories for low voltage circuits*
- ✓ Test and connect alternating current (a.c.) rotating machines*
- ✓ Test and connect transformers
- ✓ Design, install and verify compliance and functionality of general electrical installations*
- ✓ Identify, shut down and restart systems with alternate supplies*

- ✓ Apply environmentally and sustainable procedures in the energy sector
- ✓ Perform rescue from a live LV panel* Perform rescue from a live LV panel* Develop, enter, and verify discrete control programs for programmable controllers
- ✓ Assemble, mount, and connect switchgear and control gear
- ✓ Source and purchase materials/parts for installation or service jobs

TIPS AND HINTS TO HELP YOU PREPARE FOR RECOGNITION

To have skills formally recognised in the national system, assessors must make sure you have the skills and knowledge to meet the industry standard. This means you must be involved in a careful and comprehensive process that covers the content of all unit/s or qualification/s you can be recognised for.

Assessment happens in a variety of ways. Being prepared can save you valuable time and hassle and make the recognition process stress-free for you.

Here are some tips and hints for you:

1. Be prepared to talk about your job roles and your work history. Bring a resume or jot down a few points about where you have worked, either paid or unpaid, and what you did there.

2. Bring your position description and any performance appraisals you have from any electrotechnology workplaces you have worked in.

3. Consider the possibilities for workplace contact. Are you in a workplace that is supporting your goals to get qualified? Would you feel comfortable to have the assessor contact your workplace or previous workplaces so your skills can be validated?

4. Think about who can confirm your skill level. Think about current or recent supervisors who have seen you work in the past 18 months and will be able to confirm your skills. The assessor will need to contact them. You may also have community contacts or even clients themselves who can vouch for your skills level.

5. Collect any certificates from in-house training or formal training you have done in the past.

6. You can speak with your training organisation about other ways you can show your skills in the electrotechnology industry. These could be letters from employers, records of your professional development sessions, employers or clients in related industries or government agencies, acknowledgements, workplace forms (as long as they don't show client details) or other relevant documents.

STEPS IN THE RPL PROCESS

Step 1 – Provide Information of your skills and experience

Complete the attached forms and provide as much information of your previous experience in the electrotechnology industry as you can. This is your first opportunity (and not the last) to provide proof of your variety of experience in the industry. Here you can supply examples of your work history which could include:

- brief CV/resume or work history
- position descriptions of current or previous jobs
- certificates/results of assessment
- details of in-house courses, workshops, seminars, orientation, or induction sessions
- references/letters from previous employers/supervisors

Workplace documents

- any licences
- certificates/results of assessment
- indentures/trade papers
- certificates/results of assessment – interstate/overseas
- certificates/results of assessment – universities
- tickets held e.g., forklift, crane, etc
- photographs of work undertaken
- diaries/task sheets/job sheets/logbooks
- site training records
- site competencies held record
- membership of relevant professional associations
- hobbies/interests/special skills outside work
- references/letters from previous employers/supervisors
- industry awards

and any other documentation that may demonstrate industry experience.

Depending on the industry you have worked in, you may or may not have documentary evidence available. This should not deter you from seeking RPL as the Assessor will work with you during the RPL process.

You will also need to supply contact details of one or two work referees who can confirm your skills in the industry.

Step 2 – Conversation with Assessor

An assessor will review the information you have provided (usually with you) and begin to match up your skills to the units/subjects in the qualification. At this point, you will have the opportunity to discuss and identify your previous experience with the assessor who will understand your industry experience and conduct a competency conversation with you. You will be required to answer electrotechnology related questions to identify your current skills.

Step 3 – Practical demonstration of your skills

The assessor will conduct a practical skills test at your workplace (if appropriate) or at another suitable venue. This, again, is an opportunity to demonstrate your level of competence. This assessment will be focussed on skills that are required in the qualification. Your assessor will identify the skills that he/she will want you to demonstrate.

Further steps

After the assessment, your assessor will give you information about the skills that have been recognised and whether you have gained recognition against units of competency or have gained the full qualification. If you do have skill gaps, these may be addressed through flexible training.

APPLICATION – Self Assessment Questionnaire
UEE30811 Certificate III in Electrotechnology Electrician

Candidate Name: _____ Date **Completed:** _____

Please identify your level of experience in each competency. Each unit title has a more complete description of what tasks a competent person can perform and can be found at back of this application form.

If you have performed the task many times and are confident that you can prove your competency to the industry standard, tick the "frequently" box.

If you only perform the tasks occasionally, or are unsure whether you can demonstrate your competency, tick the "sometimes" box.

If you never perform the task, or feel you cannot demonstrate competence, tick the "never" box.

Unit Code	Unit Title	I have performed these tasks		
		Frequently	Sometimes	Never
CORE UNITS (review the unit descriptors at back of application before answering)				
HLTAID009	Provide cardiopulmonary resuscitation			
UEECO0023	Participate in electrical work and competency development activities			
UEECD0007	Apply work health and safety regulations, codes and practices in the workplace			
UEECD0019	Fabricate, assemble and dismantle utilities industry components			
UEECD0044	Solve problems in single path circuits			
UEECD0046	Solve problems in multi path circuits			
UEECD0020	Fix and secure electrotechnology equipment			
UEECD0051	Use drawings, diagrams, schedules, standards, codes and specifications			
UEECD0016	Document and apply measures to control WHS risks associated with electrotechnology work			
UEEEL0024	Test and connect alternating current (a.c.) rotating machines*			
UEEEL0025	Test and connect transformers*			
UEEEL0008	Evaluate and modify low voltage heating equipment and controls*			
UEEEL0009	Evaluate and modify low voltage lighting circuits, equipment and controls*			
UEEEL0010	Evaluate and modify low voltage socket outlets circuits*			
UEEEL0003	Arrange circuits, control and protection for electrical installations*			
UEEEL0019	Solve problems in direct current (d.c.) machines*			
UEEEL0021	Solve problems in magnetic and electromagnetic devices*			
UEEEL0020	Solve problems in low voltage a.c. circuits*			
UEEEL0012	Install low voltage wiring, appliances, switchgear and associated accessories*			
UEEEL0047	Identify, shut down and restart systems with alternate supplies*			
UEEEL0039	Design, install and verify compliance and functionality of general electrical installations*			
UEEEL0023	Terminate cables, cords and accessories for low voltage circuits*			

Unit Code	Unit Title	I have performed these tasks		
		Frequently	**Sometimes**	**Never**
UEEEL0018	Select wiring systems and select cables for low voltage electrical installations*			
UEEEL0014	Isolate, test and troubleshoot low voltage electrical circuits*			
UEEEL0005	Develop and connect electrical control circuits*			
UEERE0001	Apply environmentally and sustainable procedures in the energy sector			
UETDRRF004	Perform rescue from a live LV panel*			
Group A Electives				
UEECS0033	Use engineering applications software on personal computers			
UEEIC0013	Develop, enter and verify discrete control programs for programmable controllers*			
UEEAS0007	Assemble, mount and connect control gear and switchgear*			
UEEDV0005	Install and maintain cabling for multiple access to telecommunication services*			

Please answer questions below:

1. Provide details about the types of electrical installations you have repaired, installed, tested and serviced.

2. Briefly describe one electrical installation job you have recently performed, mentioning how it was planned and carried out, and with what tools, components, fittings, and meters you used. What type of premises were you working in and what OHS procedures did you follow? (Attach extra page if required).

Candidate Signature: _____ **Date**: _____

RPL APPLICATION FORM

Applicant Details:

1. Occupation you are seeking recognition in		
2 Personal details		
USI # (Unique Student Identifier)		
Surname		
Preferred title (Mr, Mrs, Ms, Miss)		
First name/s		
Any other name used		
Home address		
Postal address if different from above		
Telephone numbers	Home:	Work:
	Mobile:	Fax:
Date of birth	/ /	
Gender	MALE / FEMALE	
Age		
Are you a permanent Resident of Australia	YES / NO	
3 Current Employment		
Are you currently employed? If YES, in which occupation are you currently employed? Who is your current employer?	YES / NO …… ……	
4. Armed Forces details (If Applicable)		
Branch of Service		
Trade classification on discharge		

5. Further Training	
Have you undertaken any training courses related to the occupation applied for?	YES / NO
If Yes	
What occupation were you trained in?	
Training completion date (month, year)	
Country where you trained	
Name of course and institution (if applicable)	
6. Is there any further information you wish to give in support of your application	
7. Professional Referees- relevant to trade	
Name Position Organisation Phone number Mobile number Email address	…… …… …… …… …… ……
Name Position Organisation Phone number Mobile number Email address	…… …… …… …… …… ……

APPLICANT EMPLOYMENT HISTORY FORM

Name, Address and Phone number of Employers	Period of Employment (DD/MM/YYYY)		Position Held	Full Time Part-time Casual	Description of Major Duties
	From	To			
1.					
2.					
3.					

Attach additional sheet if required

If you are including documents in your application, please provide a brief description below *(see list in step 1 for types of documents which can be used in RPL process)*

Document Description (e.g. Statement of results/attendance, qualification, transcript of academic record, licence, resume, photos of own work, awards etc)	**Office Use Only –** Assessor to use this section to align documents to specific units of competency and identify key questions for competency conversation

Declaration

I declare that the information contained in this application is true and correct and that all documents are genuine.

Candidate Signature: _____ Date _____

REFEREE TESTIMONIAL 1

(Date)
To whom it may concern,

RE: _____skills in/as _____
(insert candidate name) *(insert industry/job title)*

I certify that the above-named person has:

worked at _____ for a period of _____ years

regularly undertaken the following activities within the workplace since commencing employment with this organisation:

➔ *Initial those skills/ competencies (below) that the candidate has or can successfully perform in the workplace*

____Provide cardiopulmonary resuscitation

____Apply work health and safety regulations, codes and practices in the workplace

____Document and apply measures to control WHS risks associated with electrotechnology work*

____Fabricate, assemble and dismantle utilities industry components*

____Fix and secure electrotechnology equipment

____Solve problems in multiple path circuits

____Solve problems in single path circuits

____Use drawings, diagrams, schedules, standards, codes and specifications*

____Participate in electrical work and competency development activities

____Arrange circuits, control and protection for electrical installations*

____ Develop and connect electrical control circuits*

____Evaluate and modify low voltage heating equipment and controls*

____Evaluate and modify low voltage lighting circuits, equipment and controls*

____ Evaluate and modify low voltage socket outlets circuits*

____Install low voltage wiring, appliances, switchgear and associated accessories*

____Isolate, test and troubleshoot low voltage electrical circuits*

____Select wiring systems and select cables for low voltage electrical installations*

____Solve problems in direct current (d.c.) machines*

____Solve problems in low voltage a.c. circuits

____Solve problems in magnetic and electromagnetic devices*

____Terminate cables, cords and accessories for low voltage circuits*

____Test and connect alternating current (a.c.) rotating machines*

____Test and connect transformers

____Design, install and verify compliance and functionality of general electrical installations*

____Identify, shut down and restart systems with alternate supplies*

____Apply environmentally and sustainable procedures in the energy sector

____Perform rescue from a live LV panel* Perform rescue from a live LV panel* Develop, enter, and verify discrete control programs for programmable controllers

____Assemble, mount, and connect switchgear and control gear

____Source and purchase materials/parts for installation or service jobs

If you would like any further information or would like to discuss any of the above, I can be contacted on _____

Yours sincerely,

Name:

Signature:

License number:

REFEREE TESTIMONIAL 2

(Date)
To whom it may concern,

RE: _____skills in/as _____
(insert candidate name) *(insert industry/job title)*

I certify that the above-named person has:

worked at _____ for a period of _____ years

regularly undertaken the following activities within the workplace since commencing employment with this organisation:

➔ *Initial those skills/ competencies (below) that the candidate has or can successfully perform in the workplace*

____Provide cardiopulmonary resuscitation

____Apply work health and safety regulations, codes and practices in the workplace

____Document and apply measures to control WHS risks associated with electrotechnology work*

____Fabricate, assemble and dismantle utilities industry components*

____Fix and secure electrotechnology equipment

____Solve problems in multiple path circuits

____Solve problems in single path circuits

____Use drawings, diagrams, schedules, standards, codes and specifications*

____Participate in electrical work and competency development activities

____Arrange circuits, control and protection for electrical installations*

____ Develop and connect electrical control circuits*

____Evaluate and modify low voltage heating equipment and controls*

____Evaluate and modify low voltage lighting circuits, equipment and controls*

____ Evaluate and modify low voltage socket outlets circuits*

____Install low voltage wiring, appliances, switchgear and associated accessories*

____Isolate, test and troubleshoot low voltage electrical circuits*

____Select wiring systems and select cables for low voltage electrical installations*

____Solve problems in direct current (d.c.) machines*

____Solve problems in low voltage a.c. circuits

____Solve problems in magnetic and electromagnetic devices*

____Terminate cables, cords and accessories for low voltage circuits*

____Test and connect alternating current (a.c.) rotating machines*

____Test and connect transformers

____Design, install and verify compliance and functionality of general electrical installations*

____Identify, shut down and restart systems with alternate supplies*

____Apply environmentally and sustainable procedures in the energy sector

____Perform rescue from a live LV panel* Perform rescue from a live LV panel* Develop, enter, and verify discrete control programs for programmable controllers

____Assemble, mount, and connect switchgear and control gear

____Source and purchase materials/parts for installation or service jobs

If you would like any further information or would like to discuss any of the above, I can be contacted on _____

Yours sincerely,

Name:

Signature:

License number:

UEE30811 Certificate III in Electrotechnology Electrician

Core Units

Unit Code	Unit Title	Scope/Descriptor
HLTAID009	Provide cardiopulmonary resuscitation	This unit describes the skills and knowledge required to perform cardiopulmonary resuscitation (CPR) in line with the Australian Resuscitation Council (ARC) guidelines. This unit applies to all persons who may be required to provide CPR, in a range of situations, including community and workplace settings.
UEECO0023	Participate in electrical work and competency development activities	This unit involves the skills and knowledge required to participate in electrical work and related activities that contribute to the ongoing development of competency.
UEECD0007	Apply work health and safety regulations, codes and practices in the workplace	This unit involves the skills and knowledge required to apply work health and safety (WHS)/occupational health and safety (OHS) regulations and codes of practices in the electrotechnology workplace. It includes applying safe working practices, following workplace procedures for hazard identification and risk control. It also includes electrotechnology worker responsibilities and application for health and safety, risk management and adherence to safety practices as part of electrotechnology work functions when preparing to enter a work area
UEECD0019	Fabricate, assemble and dismantle utilities industry components	This unit involves the skills and knowledge required to fabricate, assemble and dismantle utilities industry components using fitting and metal fabrication techniques. It includes the safe use of hand tools, fixed and portable power tools; cutting, shaping, joining and fixing; using metallic and non-metallic materials; dismantling and assembling equipment; mechanical measurement and marking out; and, reading drawings/diagrams.
UEECD0044	Solve problems in single path circuits	This unit involves the skills and knowledge required to solve problems in multiple path circuits. It includes working safely; applying problem-solving procedures, including the use of voltage, current and resistance measuring devices; and providing solutions derived from measurements and calculations to predictable problems in multiple path circuits.
UEECD0046	Solve problems in multi path circuits	This unit involves the skills and knowledge required to solve problems in single path circuits. It includes working safely; applying problem-solving procedures, including the use of basic voltage, current and resistance measuring devices; and providing known solutions to predictable circuit problems.
UEECD0020	Fix and secure electrotechnology equipment	This unit involves the skills and knowledge required to fix, secure and mount electrotechnology equipment to hollow walls, solid walls and metal fixings. It includes the safe use of hand and portable tools/ power tools and the selection and safe application of fixing devices and supporting accessories/equipment.

UEECD0051	Use drawings, diagrams, schedules, standards, codes and specifications	This unit involves the skills and knowledge required to use drawings, diagrams, cable schedules, industry standards, codes of practice and specifications as they apply to various electrotechnology work functions. It includes interpreting schematic, wiring and mechanical diagrams, equipment and cable/connection schedules and manuals; and the use and format of compliance standards, codes and job specifications used in the electrotechnology industry. It also includes the use of site and architectural drawings/plans to show the location of services, apparatus, plant and machinery.
UEECD0016	Document and apply measures to control WHS risks associated with electrotechnology work	This unit involves the skills and knowledge required to identify, document and apply work health and safety (WHS)/occupational health and safety (OHS) hazard and risk control measures associated with electrotechnology work. It includes identifying workplace hazards, assigning levels of risk, developing control measures to eliminate and/or mitigate risks, reviewing risk control measures and maintaining documentation of hazards, risk control measures and their application in accordance with compliance procedures. This unit addresses information, processes and techniques for the application of WHS/OHS, specific to working in the electrotechnology sector and is essential for workers without managerial or supervisory responsibilities.
UEEEL0024	Test and connect alternating current (a.c.) rotating machines*	This unit involves the skills and knowledge required to test and connect alternating current (a.c.) rotating machines. It includes safe working practices, ascertaining correct operation of a.c. machines and solving problems as they apply to servicing, fault finding, installation and compliance work functions The skills and knowledge described in this unit require a licence or permit to practice in the workplace where work is carried out on electrical installations which are designed to operate at voltages greater than 50 volt (V) a.c. or 120 V direct current (d.c.).
UEEEL0025	Test and connect transformers*	This unit involves the skills and knowledge required to solve problems in transformers. It includes safe working practices, ascertaining correct operation of transformers and solving problems as they apply to servicing, fault finding, installation and compliance work functions. The skills and knowledge described in this unit require a licence or permit to practice in the workplace where work is carried out on electrical installations which are designed to operate at voltages greater than 50 volt (V) alternating current (a.c.) or 120 V direct current (d.c.).
UEEEL0008	Evaluate and modify low voltage heating equipment and controls*	This unit involves the skills and knowledge required to evaluate and modify low voltage (LV) heating equipment and controls. It includes working safely, identifying faults in heating equipment, repairing heating equipment, ensuring all work complies with relevant Australian Standards and legislation, and completing work and documenting activities.
UEEEL0009	Evaluate and modify low voltage lighting circuits, equipment and controls*	This unit involves the skills and knowledge required to evaluate and modify low voltage (LV) lighting circuits, equipment and controls. It includes working safely, identifying faults in luminaires and associated control equipment, repairing/replacing luminaire and control equipment components, ensuring all work complies with relevant Australian Standards and legislation, and completing work and documenting activities
UEEEL0010	Evaluate and modify low voltage socket outlets circuits*	This unit involves the skills and knowledge required to evaluate and modify low voltage (LV) socket outlets circuits. It includes working safely, identifying and repairing/replacing faulty socket outlets, ensuring all work complies with relevant Australian Standards and legislation, and completing work and documenting activities.

UEEEL0003	Arrange circuits, control and protection for electrical installations*	This unit involves the skills and knowledge required to select, arrange and terminate circuits, control and protection devices and systems for electrical installations operating at low voltage (LV). It includes protection of persons and property, correct functioning, ensuring compatibility with the supply, arranging installation into circuits, selecting and arranging switchgear/control gear and protective devices to meet compliance requirements, and documenting arrangement decisions.
UEEEL0019	Solve problems in direct current (d.c.) machines*	This unit involves the skills and knowledge required to determine correct operation of direct current (d.c.) machines and provide solutions as they apply to electrical installations and equipment. It includes working safely, the use of testing and measuring devices, and providing solutions derived from measurements and calculations to predictable problems in d.c. machines
UEEEL0021	Solve problems in magnetic and electromagnetic devices*	This unit involves the skills and knowledge required to determine correct operation of electromagnetic devices and related circuits and provide solutions as they apply to electrical installations and equipment. It includes working safely; applying power circuit problem-solving processes, including the use of testing and measuring devices; and providing solutions derived from measurements and calculations to predictable problems in electromagnetic devices and related circuits.
UEEEL0020	Solve problems in low voltage a.c. circuits*	This unit involves the skills and knowledge required to ascertain correct operation of single and three phase alternating current (a.c.) circuits and solving circuit problems as they apply to servicing, fault finding, installation and compliance work functions. It includes safe working practices, multi-phase circuit arrangements, issues related to fault protection, power factor and multiple earthed neutral (MEN) systems and solutions to circuit problems derived from calculated and measured parameters.
UEEEL0012	Install low voltage wiring, appliances, switchgear and associated accessories*	This unit includes the installation of wiring enclosures, cable support systems, cables, protection devices, switchgear, control gear, switchboards, and accessories designed to operate at voltages up to 1,000 volt (V) alternating current (a.c.) or 1,500 V direct current (d.c.). It covers working safely and to installation standards, routing cables to specified locations, terminating cables and connecting wiring at accessories, matching appliances and accessories with that specified, making required circuit connections and completing the necessary installation documentation.
UEEEL0047	Identify, shut down and restart systems with alternate supplies*	This unit involves the skills and knowledge required to identify, shut down and restart systems with alternate supplies. It includes identifying the system configuration, working safely with electricity generation systems and inverters, identifying hazards and controlling the associated risks, isolation and testing for de-energisation, reinstating the system after isolation, and completing relevant documentation
UEEEL0039	Design, install and verify compliance and functionality of general electrical installations*	This unit involves the skills and knowledge required to design, install, inspect and test to verify an electrical installation is safe and complies with regulatory requirements. It includes working safely; designing, installing, commissioning and fault finding of electrical installations; visual inspections and mandatory testing; following workplace procedures; and completing mandatory reporting requirements. The skills and knowledge described in this unit require a licence or permit to practice in the workplace where work is carried out on electrical installations which are designed to operate at voltages greater than 50 volt (V) alternating current (a.c.) or 120 V direct current (d.c.).

UEEEL0023	Terminate cables, cords and accessories for low voltage circuits*	This unit involves the skills and knowledge required to terminate cables, cords and their conductors at accessories and current-using devices, designed to operate at voltages up to 1,000 volts (V) alternating current (a.c.) or 1,500 V direct current (d.c.). It includes working safely to industry standards, wiring systems, cable types and applications; selecting appropriate termination accessories; preparing and terminating cables and cords; terminating cables/cord conductors; and ensuring completed termination complies with industry standard requirements
UEEEL0018	Select wiring systems and select cables for low voltage electrical installations*	This unit involves the skills and knowledge required to select wiring systems and cables for electrical installations operating at voltages up to 1,000 volt (V) alternating current (a.c.) or 1,500 V direct current (d.c.). It includes application of wiring systems and cable types, selecting wiring system compatible with the installation conditions, selecting cables that comply with required current-carrying capacity and voltage drop and earth fault-loop impedance limitations, coordinating between protective devices and conductors, and documenting selection decisions.
UEEEL0014	Isolate, test and troubleshoot low voltage electrical circuits*	This unit involves the skills and knowledge required to isolate, test and troubleshoot electrical circuits operating at voltages up to 1,000 volts (V) alternating current (a.c.) or 1,500 V direct current (d.c.). It includes working safely, isolating electrical circuits, evaluating low voltage (LV) electrical circuits, applying systematic fault-finding procedures, conducting repairs and completing the necessary documentation.
UEEEL0005	Develop and connect electrical control circuits*	This unit involves the skills and knowledge required to develop, connect and functionally test electrical power and control circuits that perform specific control functions. It includes working safely, developing schematic diagrams and converting them to wiring diagrams, selecting and connecting contactors and control devices to perform a specific function. It also includes testing electrical control circuits and completing circuit development activities documentation.
UEERE0001	Apply environmentally and sustainable procedures in the energy sector	This unit involves the skills and knowledge required to apply environmentally sustainable procedures in the energy sector. It includes identifying and applying sustainable methods of work practice that minimise energy and material usage and to apply energy reduction strategies in the energy sector workplace.
UETDRRF004	Perform rescue from a live LV panel*	This unit covers the performance of rescue procedures from live low voltage (LV) apparatus, not including overhead lines and underground cables in the workplace. It specifies the mandatory requirements of rescue from a live LV panel and how they apply in the context of transmission, distribution or rail work functions. It encompasses responsibilities for health, safety and risk management processes at all operative levels and adherence to safety practices as part of the normal way of doing work
Group A Electives		
UEECS0033	Use engineering applications software on personal computers	This unit involves the skills and knowledge required to use computer application software relevant to engineering support work functions. It includes using computer engineering application software, menus and tools, entering and retrieving information, transferring and printing files and shutting down computer applications. This unit applies to personnel using computer application software relevant to a workplace. Typically, this will apply to individuals working under supervision

UEEIC0013	Develop, enter and verify discrete control programs for programmable controllers*	This unit involves the skills and knowledge required to develop, enter and verify programs for programmable logic controller (PLC) (also known as programmable controller) for a system requiring discrete control functions. It includes working safely, using control systems and control system development methods, using ladder diagrams/statement list/function block diagram instruction sets, following written instructions, and documenting program development and testing activities
UEEAS0007	Assemble, mount and connect control gear and switchgear*	This unit involves the skills and knowledge required to assemble, mount and connect control gear and switchgear, including the interconnections within a switchboard enclosure intended to operate at voltages up to 1,000 volts (V) alternating current (a.c.) or 1,500 V direct current (d.c.). It includes working safely; following standards, specifications and component manufacturer requirements; matching equipment with that specified; terminating cables; connecting wiring and completing necessary documentation
UEEDV0005	Install and maintain cabling for multiple access to telecommunication services*	This unit involves the skills and knowledge required to install and maintain telecommunications cabling in buildings and premises. It includes working to relevant regulations, legislation, codes of practice and industry standards and to Australian Communications and Media Authority's (ACMA) Telecommunications Cabling Provider Rules; installing multiple telecommunication lines for multiple access to telecommunication services; terminating at telecommunication outlets, termination modules and distributors; testing for compliance and completing cabling documentation. This unit applies to customer cabling terminated on distributors and to the installation, maintenance and modification of indoor, external, underground cabling and customer cabling and may be used to connect devices for a range of applications, including telecommunications phones, data (video and multimedia) and security (alarms and fire protection).

SECTION C

Competency Conversation and Record of Conversation Sheets

This section assists the assessor in documenting the competency conversation.

Do NOT give this section to the candidate.

Once you have assessed the candidate's documentary information and determined which competencies you still require more information/evidence on, you use the question bank and Record of Conversation sheets in this section to document evidence of past experience. It is not intended that every question for all competencies be discussed during the conversation, only those competencies the initial documentary review has failed to fully address.

Each question has "key points" to look for in responses. You may use the list of key points to formulate questions of your own if you wish or contextualise or rephrase the suggested question to the candidate's particular work situation. The questions are not intended to be a formal 'script' for the assessor to follow, but to provide guidance in exploring the range of the candidate's skills, knowledge, and experience in performing a particular task or function.

The Record of Conversation sheets indicate relevant content that should be sought. Place a tick next to each key point as you hear this topic being discussed during the conversation. In doing so, you are making a statement of fact about what you hear the candidate say during the competency conversation. Use the Comments section to provide further detail about the context of the discussion or briefly outline any examples discussed by the candidate. You may also use the Comments section to make a brief analysis of the responses or summary judgements about the quality of the candidate's responses in relation to the requirements of the competency standard.

Remember, the notes you take about this conversation are important evidence and should be retained in the candidate's assessment record.

QUESTION BANK
UEE30811 Certificate III in Electrotechnology Electrician

Note to Assessors: Refer to "Record of Conversation" sheets
(Performance criteria, industry context, critical aspects of evidence, essential knowledge, and skills)

Unit of Competency	Questions
UEECD0007 Apply work health and safety regulations, codes and practices in the workplace **Core**	1. (Prepare to enter an electrotechnology workplace) Discuss what safety processes you have followed before entering a work area and what procedures you have used to ensure a safe work area, including how tools and equipment are checked for safety and correct functionality? 2. (App ly safe electrotechnology working practices) What are typical hazards you have come across in your work and what risk management control measures did you initiate? 3. (Follow electrotechnology workplace procedures for hazard identi fication and risk cont rol) How would you deal with an accident or fire that has occurred in your work area?
UEECD0016 Document and apply measures to control WHS risks associated with electrotechnology work (Identify and document hazards and risks associated with electrotechnology work) (Assign levels of risk and develop and document control measures) (Monitor, review and document risk control measures) **Core**	4. Explain where you have used documentation in recording hazards, their risk classification and control measures used?
Generic Questions Plan and prepare	5. Before you commence a new job or task, how have you established the scope of work to be undertaken, tools and equipment requirements and obtained appropriate resources? How do you monitor variations to the job?
Generic Questions Communication	6. What procedures do you follow for non-routine events and job variations that occur on the work site? 7. Provide an example of a recent electrotechnology job you have performed and the steps you followed when completing service reports, and another workplace documentation? What information do you provide in that documentation and how is that communicated to the appropriate persons when completing a job?
Generic Questions Sustainable Work Practices	8. Explain how you have actively employed sustainable energy principles during and completing a job and when leaving the work site at the end of the day?

Unit of Competency	Questions
UEECD0019 Fabricate, assemble and dismantle utilities industry components **Core**	9. Provide an example and explain the process you have followed when dismantling and assembly of components. 10. Provide an example and explain the process you have followed when fabricating components.
UEEEL0024 Test and connect alternating current (a.c.) rotating machines * UEEEL0025 Test and connect transformers*. **Core**	11. (a) Provide examples of the types of single/ three phase machines you have worked on and what problem-solving procedures you have followed? 11 (b) Provide examples of the types of transformers you have worked on and what problem-solving procedures you have followed
UEECD0020 Fix and secure electrotechnology Equipment **Core**	12. Give examples of the types of fixing devices and fitting/accessories and tools that you have used to install electrotechnology equipment. Provide an example of equipment that you have fixed and secured, outlining the steps you have undertaken.
UEECD0051 Use drawings, diagrams, schedules, standards, codes and specifications **Core**	13. Provide details of the types of drawings and manuals you have used in the workplace and give examples of how they were used.
UEECD0044 Solve problems in single path circuits UEECD0046 Solve problems in multi path circuits **Core**	14. (a) Provide examples of how you have solved problems in series d.c. circuits and what d.c. principles have you applied? 14 (b) Provide examples of how you have solved problems in parallel d.c. circuits and what d.c. principles have you applied?
UEEEL0020 Solve problems in low voltage a.c. circuits* **Core**	15. Demonstrate an understanding of correct operation of single and three-phase a.c. circuits and solving circuit problems as they apply to servicing, fault finding, installation and compliance work functions, encompassing safe work practices, multiphase circuit arrangements, issues related to protection, power factor and MEN systems and solutions to circuit problems derived from calculated and measured parameters.

Unit of Competency	Questions
UEEEL0019 Solve problems in direct current (d.c.) machines* UEEEL0021 Solve problems in magnetic and electromagnetic devices* **Core**	16. (a) Explain how you have determined correct operation of electromagnetic circuits and the processes you follow when providing solutions derived from measurements and calculations. 16 (b) Explain how you have determined correct operation of dc motor and dc generator and the processes you follow when providing solutions derived from measurements and calculations
UEEEL0008 Evaluate and modify low voltage heating equipment and controls* UEEEL0009 Evaluate and modify low voltage lighting circuits, equipment and controls* UEEEL0010 Evaluate and modify low voltage socket outlets circuits* **Core**	17. Explain how you have solved problems in single and three phase low voltage circuits and the processes you follow when providing solutions derived from measured and calculated values? 17(a) Explain how you have solved problems in low voltage heating equipment and controls* 17(b) Explain how you have solved problems in low voltage lighting circuits, equipment and controls 17(c) Explain how you have solved problems in low voltage socket outlets circuits*
UEEEL0012 Install low voltage wiring, appliances, switchgear and associated accessories* **Core**	18. What are the types of wiring enclosures, cable support systems, cables and accessories you have installed? What are the processes you follow when installing and terminating cables and connecting wiring at accessories?
	19. What are the types of low voltage electrical apparatus and associated equipment you have installed and what processes have you followed when installing and connecting apparatus?
UEEEL0039 Design, install and verify compliance and functionality of general electrical installations* **Core**	20. What have been the types of electrical installations that you have inspected and tested to verify whether is safe and complies with all requirements? Describe the process you undertake in verifying electrical installations for safety and regulatory compliance.

Unit of Competency	Questions
UEEEL0018 Select wiring systems and select cables for low voltage electrical installations* **Core**	21. What have been the types of electrical equipment that you have selected and arranged for general electrical installations? Describe the process you undertake in selecting and arranging equipment for electrical installations?
UEEEL0014 Isolate, test and troubleshoot low voltage electrical circuits* **Core**	22. What have been the types of faults you have found and repaired in low voltage electrical apparatus and circuits? Describe the process you undertake when applying fault finding techniques for repair of low voltage electrical apparatus and circuits.
UEEEL0005 Develop and connect electrical control circuits* **Core**	23. What have been the types of control circuits that you have developed and connected? Describe the process you undertake in developing and connecting a control circuit including functional tests you have performed.
UEEIC0013 Develop, enter and verify discrete control programs for programmable controllers* **Group A Elective** **(Demonstration Observation)**	24.a) Discuss your actions in carrying out your obligations and responsibilities prior to commencing work. As well as work preparation include your obligations and responsibilities under current OH&S legislation. You should include in your response actions taken in regard to: b) You are required to determine from specifications a control system scenario. Provide examples of control functions. Describe the steps you would take to develop this control system. Included in your description should be comments relating to: c) Derived timers' counters, jump instructions, latching relays and simple step sequence. d) Discuss the testing methods and tools as monitor mode as an aid for fault finding and inbuilt software/ hardware and use of error codes. e) Examples of storage mediums IC storage, disks, servers.
UEEAS0007 Assemble, mount and connect control gear and switchgear* **Group A Elective**	25. What have been the types of switchgear and control gear you have installed and connected for control panels and switchboards? Explain the processes you follow in selecting, installing, and connecting switchgear and control gear.
UEECS0033 Use engineering applications software on personal computers **Group A Elective**	26. What have been the types of computer applications you have used in your work environment and outline the steps you take in using computer applications including how information is used, files stored and forwarded?
UEECS0033 Use engineering applications software on personal computers **Core**	27. What types of computer applications you have used in your work environment, and outline the steps you take in using computer applications including how information is used, files stored and forwarded?

Unit of Competency	Questions
UEERE0001 Apply environmentally and sustainable procedures in the energy sector **Core**	28. Provide examples of the sustainable work practices that you have used in the workplace.
UEECO0023 Participate in electrical work and competency development activities **Core**	29. How have you monitored your competency development and ensured your progression of knowledge and skills was maintained? **Note:** *This unit of competency is designed for an apprentice/learner in employment-based programs covered by an approved contract of training. To RPL in this unit the assessor must therefore establish that candidate has been actively participating in own competency development to the level of performance required by this unit. Where gap training is required to gain qualification, assessor can use this opportunity to collect additional relevant evidence from candidate for support of this unit.*
UEEEL0003 Arrange circuits, control and protection for electrical installations* Core	30. What type of control and protection devices have you installed in the workplace? And how have you verified compliance?
UEEEL0023 Terminate cables, cords and accessories for low voltage circuits	31. List the type of cables you have terminated using safe work practices.
HLTAID009 Provide cardiopulmonary resuscitation **Core**	32. Demonstrate cardiopulmonary resuscitation.
UETDRRF004 Perform rescue from a live LV panel* **Core**	33. Demonstrate how to rescue a workmate from a live LV panel
UEEEL0047 Identify, shut down and restart systems with alternate supplies** **Core**	34. When the main power supply is broken down, provide the work procedure to identify, shut down and restart the system with alternate supply

NOTE – Those shaded by Yellow colour are new questions which were not included in previous RPL Kit.

Results / Comments Descriptions	
AT	Australian Transcripts
OT	Overseas Transcripts
PE	Photo Evidence
VR	Video Recording
AR	Audio Recording
SD (Resume,	Supporting Documents
IK	Industry Knowledge
SK	Skills knowledge

RECORD OF CONVERSATION

UEECD0007 Apply work health and safety regulations, codes and practices in the workplace.

Core

CANDIDATE'S NAME: _____ ASSESSOR'S **NAME:** _____ **DATE:** ____/____/____

Question 1: Discuss what OH&S procedures you have followed before entering a work area and what procedures you have used to ensure a safe work area, including how tools and equipment are checked for safety and correct functionality.

Question 2: What are typical *hazards* you have come across in your work and what risk management control measures did you initiate?

Question 3: What are the procedures for dealing with an accident or emergency in your workplace?

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 1	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2018 Environmental protection Manufacturer's instructions for materials and equipment		
Demonstrates understanding and applies OHS procedures in workplace and legal responsibilities for personal safety of self and for others: • employer and employee responsibilities for rights, obligations for personal safety for self and others • functions of safety committees, inspectors, and representatives.			
Monitors condition of equipment, tools, and meters to regulatory requirements.			
Identifies and obtains instructions in hazards and risk control measures for specific work functions including work area access permits.			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Understands requirements for live work, use of PPE and safety observer.	Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Low Voltage Rescue First Aid and CPR Elevated Work Platforms Permit		
Understands the necessity of work permits and exclusion zones, clearances (hazardous areas, proximity to live LV/HV cable).			
Understands purpose of isolation and can apply correct procedure for electrical & mechanical isolation including use of danger and warning tags.			
Question 2			
Uses workplace safety checklist.			
Identifies and reports workplace hazards and potential hazards (electrical and non-electrical) and consults with others in implementing and monitoring control measures.			
Recognises sources of pollution and control measures.			
Works safely with tools: • understands the effects of electric shock • purpose of circuit and personal protection devices: o fuses o circuit breakers o RCD.			
Understands and follows correct isolation according to workplace procedures.			
Follows workplace procedures and work instructions for controlling risk.			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Uses and maintains correct PPE: • gloves • safety glasses • long sleeves, etc.			
Question 3			
Ensures hazard and risk control measures are implemented and reported.			
Can complete OHS records of incident and report to regulatory requirements and established procedures.			
Understands emergency procedures for the rescue of an electric shock victim (LVR).			
Has required knowledge to carry out basic first aid procedures and CPR.			
Understands dangers of refrigerant gas inhalation: • rescue procedures • CPR procedures.			
Follows workplace procedures in dealing with accidents and incidents.			
Understands and follows workplace instructions and training to established procedures.			

RECORD OF CONVERSATION

UEECD0016 Document and apply measures to control WHS risks associated with electrotechnology work. Core

CANDIDATE'S NAME:_____ **ASSESSOR'S NAME:**_____**DATE:** ____/____/____

Question 4: Explain where you have used documentation in recording hazards, their risk classification and control measures used.

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 4	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2018 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation JSEA (job safety and environmental analysis SOP, Work permits, Safety		
Identifies and documents hazards using appropriate processes while consulting with others: • electrical conditions, voltage levels • radiation and energy levels • toxic substances, airborne particles • pressure discharge, explosive atmosphere • worksite and specific location • general work-site conditions • moving parts • tools and equipment • worker's competence and/or capacity and/or personal effects.			
Makes changes to documentation for unforseen hazards.			

KEY POINTS The candidate's response should evidence the following	INDUSTRY REQUIREMENTS These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	COMMENTS Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Identifies risk classification to established procedures: • high (potential to kill) • medium (potential to cause injury) • low (potential to cause minor injury).	checklists, incident reports) Low Voltage Rescue CPR Elevated Work Platforms Permit		
Develops control measures to eliminate risk according to classification: • uses different approaches to work or redesign • uses different equipment or machinery • fixes defective equipment • PPE.			
Seeks agreement on control measures and documents and gives access to others.			
Monitors and reviews control measures and modifies in consultation with others.			
Files documentation according to established procedures.			
Understands principles and legal responsibilities and regulatory requirements in managing hazards and assessing risks in the workplace.			

RECORD OF CONVERSATION

Generic Components – Plan and Prepare

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME:** _____ **DATE:** ____/____/____

Question 5: Before you commence a new job or task, how have you established the scope of work to be undertaken, tools and equipment requirements and obtained appropriate resources?

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 5	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2018 Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation Workplace policies and procedures		
Obtains documentation and work requirements from supervisor and establishes work to be undertaken.			
Ensures work is coordinated effectively with others.			
Obtains materials, specifications, and drawings according to established routines and procedures.			
Obtains tools and equipment including measuring and testing devices and checks for correct operation and safety.			
Confirms job requirements with supervisor before commencing work.			

RECORD OF CONVERSATION

Generic Components – Communication

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME:** _____**DATE:** ____/____/____

Question 6: What procedures do you follow for non-routine events and job variations that occur on the work site?

Question 7 Provide an example of a recent electrotechnology job you have performed and the steps you followed when completing service reports, and other workplace documentation?

What information do you provide in that documentation and how is that communicated to the appropriate persons when completing a job?

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 6	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2018 Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation Workplace policies and procedures		
Follows procedures for referring non-routine events to immediate supervisor for directions.			
Communicates to others to ensure awareness of site changes and effective work co-ordination.			
Question 7			
Informs supervisor and other appropriate persons on job completion.			
Completes status/ service reports and test certificates to established workplace procedures.			
Documents details of repairs and works completed.			
Notes any defects.			

RECORD OF CONVERSATION

Generic Components – Sustainable Work Practices

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME:**_____ **DATE:** ____/____/____

Question 8: Explain how you have actively employed sustainable energy principles during and completing a job, and when leaving the work site at the end of the day?

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 8	Workplace Health and Safety Act: 1995		
Understands and uses sustainable energy work practices.	Electrical Safety Act & Regulations		
Work site made safe.	Electrical Code of Practice		
Actively reduces waste.	Environmental and building regulations		
Checks tools and equipment for faults and report them to supervisor.	Manufacturer's instructions for materials and equipment		
Cleans, maintains, stores and secures equipment.	Correct use of MSDS data		
Clears the work area of all waste.	Workplace documentation		
Material wastage disposed to manufacturers and industry requirements.	Workplace policies and procedures		

RECORD OF CONVERSATION

UEECD0019 Fabricate, assemble and dismantle utilities industry components. Core

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME:**_____DATE**:** ____/____/____

Question 9: Provide an example and explain the process you have followed when dismantling and assembly of components.

Question 10: Provide an example and explain the process you have followed when fabricating components.

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 9	Electrical Safety Act & Regulations Electrical Code of Practice Manufacturer's instructions for materials and equipment Correct use of MSDS data Engineering references/ specifications, plans, drawings Workplace documentation Workplace policies and procedures		
Uses manufacturer guides.			
Selects and uses appropriate tools and techniques (hand and power).			
Marks or tags components to ensure correct assembly.			
Replaces or repairs components to manufacturer specifications.			
Stores parts to protect against loss or damage.			
Works with minimising waste of materials.			
Assembles to manufacturer's user guides and established procedures and techniques: • including techniques for close fitting parts.			
Performs routine quality checks.			

KEY POINTS The candidate's response should evidence the following	INDUSTRY REQUIREMENTS These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	COMMENTS Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 10			
Follows drawings and instructions accurately.			
Selects and uses appropriate tools and techniques (hand and power): • cutting • shaping • drilling • threading and tapping.			
Sharpens drills correctly to manufacturers' specifications.			
Calculates and measures accurately for component dimensions from information given in job drawings and instructions.			
Fabricates components efficiently minimising waste of materials and damage to environment and services.			
Performs routine quality checks.			

RECORD OF CONVERSATION

UEEEL0024 Test and connect alternating current (a.c.) rotating machines*Core

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME** _____ **DATE:** ____/____/____

13. **Question 11a:** Provide examples of the types of single/ three phase machines you have worked on and what problem-solving procedures you have followed?

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 11a:	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation Workplace policies and procedures		
Indicates has worked on problems related to installation, fault finding, maintenance or development work functions.			
Understands requirements for testing and measuring live to be in accordance with Electrical Safety legislation.			
Determines the operating parameters of an existing machine including: • Alternating current rotating machines.			
Three phase motor construction and operating principles.			
Understands the type of single-phase machines e.g. capacitor start and run, PSC principles of operation, operating characteristics and applications. Motor reversal and motor protection. For example:			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Performs basic insulation resistance, continuity, and winding identification tests. Demonstrates understanding of electrical principles including: • Using the right-hand grip rule for conductors and solenoids and Flemings right and left-hand rule. • Relationship between torque, speed and power and interpretation of speed / torque curves of induction motors. • Types of motor of motor overload protection • Selecting suitable protection devices for a given motor and starter combination. • Effects of repetitive starting and or reversing of motors. • Principles of operation of a synchronous and asynchronous motor/ generator (induction generator). • Effects on generated voltage of variations of load/ excitation. • Ratings of single and three phase portable/ standby alternators, and applications.			

RECORD OF CONVERSATION

UEEEL0025 Test and connect transformers*Core

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME** _____ **DATE:** ____/____/____

14. **Question 11b:** Provide examples of the types of single/ three phase machines you have worked on and what problem-solving procedures you have followed?

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 11b:	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation Workplace policies and procedures		
Indicates has worked on problems related to installation, fault finding, maintenance or development work functions.			
Understands requirements for testing and measuring live to be in accordance with Electrical Safety legislation.			
Determines the operating parameters of an existing machine including: • Transformer construction, operation, efficiency • Transformer types, parallel operation • .			
Performs basic insulation resistance, continuity, and winding identification tests. Determination of transformer losses and efficiency using test results. Demonstrates understanding of electrical principles including:			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
• Principles of mutual induction of a transformer. • Determine the value secondary current and voltage given one winding electrical detail and turns ratio. • Identification of voltage and current components of a phaser diagram for a transformer on no-load • Determine the voltage regulation of a transformer form voltage and percentage impedance values • Using the right-hand grip rule for conductors and solenoids and Flemings right and left-hand rule.			

RECORD OF CONVERSATION

UEECD0020 Fix and secure electrotechnology equipment Core

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME** _____ **DATE:** ____/____/____

Question 12: Give examples of the types of fixing devices and fitting/accessories and tools that you have used to install electrotechnology equipment.

Provide an example of equipment that you have fixed and secured, outlining the steps you have undertaken.

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 12:	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation Workplace policies and procedures		
Identifies and accesses material using workplace procedures.			
Uses and installs a variety of fixing devices appropriate to weight and position: floor, wall or ceiling <5Kg, <20Kg, <50Kg: • hollow wall • concrete • steel • brick. Understands and complies with technical standards and job specifications.			
Uses and selects a variety of appropriate tools: • hand (cutting, shaping, threading, and tapping) • power (drills, saws etc.) o portable o fixed.			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Fixes and secures to: • industry time frames • minimise wastage and disposes according to workplace practice • prevent damage to surrounding environment • Sustainable Energy principles and practices.			
Shows knowledge and understanding of environment and building regulation including the protocols for working in and around protected environments and heritage sites.			

RECORD OF CONVERSATION

UEECD0051 Use drawings, diagrams, schedules, standards, codes and specifications. Core

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME** _____ **DATE:** ____/____/____

Question 13: Provide details of the types of drawings and manuals you have used in the workplace and give examples of how they were used.

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 13:	AS/NZS3000:2018		
Correctly obtains information from a variety of drawings, diagrams, schedules and manuals: • drawing layouts • conventions and symbols • dimensions • location of equipment • schematics and wiring diagrams • cable schedules • termination schedule • site and architectural drawings and plans: o services, apparatus plant and machinery.	AS/NZS drawing standards Electrical Code of Practice Workplace documentation Workplace policies and procedures Manufacturer's instructions for materials and equipment Engineering references/ specifications, plans, drawings		
Uses freehand drawing conventions used to convey information.			
Correctly adjusts drawings to reflect variations according to established procedures and forwards to appropriate persons.			

RECORD OF CONVERSATION

UEECD0044 Solve problems in single path circuits. Core

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME** _____ **DATE:** ____/____/____

Question 14: Provide examples of how you have solved problems in series/parallel d.c. circuits and what d.c. principles have you applied?

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 14:	Electrical Safety Act Electrical Safety Regulations Code of Practice – Electrical work Standard Operating Procedures (SOP) Job Safety and Environmental Analysis (JSEA) Workplace documentation, policies, and procedures		
Meets regulatory requirements to undertake electrical work (electrical licence, electrical work permit, apprenticeship or performs electrical work under a "prescribed place of work" as defined by the Electrical Safety Act section18 d).			
Determines nature of circuit problems and scope of work and materials from documentation, supervisor or customer and coordinates work with others.			
Determines need to test or measure live and follows risk control measures as determined by regulatory requirements.			
Tests all equipment for correct operation and isolates circuits according to established procedures.			
Uses established methods to determine operating parameters and solves d.c. circuit problems from measured and calculated values: resistance, voltage, current and power dissipated.			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Understands hazards associated with using meters and uses correct meters and probes.			
Understands hazards associated with charged capacitors and follows established procedures in testing.			
Modifies and develops circuits within limits of operating parameters and according to function requirements.			
Circuit problems solved without damage to equipment and uses sustainable energy practices.			
Deals with unplanned events using essential knowledge and skills of d.c. electrical principles as applied to series d.c. circuits.			

RECORD OF CONVERSATION

UEECD0046 Solve problems in multi path circuits. Core

Question 14: Provide examples of how you have solved problems in series/parallel d.c. circuits and what d.c. principles have you applied?

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 14:	Electrical Safety Act Electrical Safety Regulations Code of Practice – Electrical work Standard Operating Procedures (SOP) Job Safety and Environmental Analysis (JSEA) Workplace documentation, policies, and procedures		
Meets regulatory requirements to undertake electrical work (electrical licence, electrical work permit, apprenticeship or performs electrical work under a "prescribed place of work" as defined by the Electrical Safety Act section18 d).			
Determines nature of circuit problems and scope of work and materials from documentation, supervisor or customer and coordinates work with others.			
Determines need to test or measure live and follows risk control measures as determined by regulatory requirements.			
Tests all equipment for correct operation and isolates circuits according to established procedures.			
Uses established methods to determine operating parameters and solves d.c. circuit problems from measured and calculated values: resistance, voltage, current and power dissipated.			
Understands hazards associated with using meters and uses correct meters and probes.			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Understands hazards associated with charged capacitors and follows established procedures in testing.			
Modifies and develops circuits within limits of operating parameters and according to function requirements.			
Circuit problems solved without damage to equipment and uses sustainable energy practices.			
Deals with unplanned events using essential knowledge and skills of d.c. electrical principles as applied to parallel d.c. circuits and series/parallel dc circuits			

RECORD OF CONVERSATION

UEEEL0023 Terminate cables, cords and accessories for low voltage circuits*Core

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME** _____ **DATE:** ____/____/____

Question 15 What are the types of extra-low voltage wiring/cabling systems you have installed and explain the processes you have followed in installing and terminating ELV systems.

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 15:	AS/NZS Wiring Rules 3000:2018 Electrical Safety Act Electrical Safety Regulations Code of Practice – Electrical work Standard Operating Procedures (SOP) Job Safety and Environmental Analysis (JSEA) Workplace documentation, policies, and procedures		
Meets regulatory requirements to undertake electrical work (electrical licence, electrical work permit, apprenticeship or performs electrical work under a "prescribed place of work" as defined by the Electrical Safety Act section18 d).			
Uses ***at least one*** of the following wiring/cabling systems: • enclosed thermoplastic insulated (TPI) or sheathed cables • unenclosed thermoplastic sheathed (TPS) cable.			
Uses ***at least three*** of following wiring/cabling systems • single cable, flexible cable, flexible cord, shielded cable, armoured cable, ribbon cable, • other similar and like cable.			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Installs and terminates ELV powered devices in: • security • controls • integrated systems • audio/video systems.			
Follows OHS and risk control procedures.			
Determines nature and scope of work, sources materials and coordinates work with others.			
Determines need to test or measure live and follows risk control measures as determined by regulatory requirements and safe working practices.			
Uses and selects appropriate tools, cables, and accessories.			
Tests all equipment for correct operation and safety and isolates circuits according to established procedures.			
Follows appropriate cable routes and installs cable and accessories to comply with standards, job specifications and established work practices.			
Terminates cables and accessories to manufacture's specifications and regulatory requirements.			
Installs cables and terminates without waste or damage to equipment and uses sustainable energy practices.			
Cleans work site, makes safe and notifies appropriate persons regarding completion of work using established procedures.			

RECORD OF CONVERSATION

UEEEL0021 Solve problems in magnetic and electromagnetic devices*Core

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME** _____ **DATE:** ____/____/____

Question 16a: Explain how you have determined correct operation of electromagnetic circuits and the processes you follow when providing solutions derived from measurements and calculations.

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 16a	AS/NZS Wiring Rules 3000:2018 Electrical Safety Act Electrical Safety Regulations Code of Practice – Electrical work Standard Operating Procedures (SOP) Job Safety and Environmental Analysis (JSEA) Workplace documentation, policies and procedures		
Regularly uses voltage, current and resistance measuring devices in determining correct operation and solving problems in electromagnetic circuits.			
Determines nature and scope of work, sources materials and coordinates work with others.			
Determines need to test or measure live and follows risk control measures as determined by regulatory requirements and safe working practices.			
Uses and selects appropriate tools, cables and accessories.			
Tests all equipment for correct operation and safety and isolates circuits according to established procedures.			
Uses established methods to solve circuit problems from measure and calculated values.			
Develops and alters existing electromagnetic circuit to comply with specified operating parameters.			
Applies control measures to electrical devices and machines operating at low voltage.			
Cleans work site, makes safe and notifies appropriate persons regarding completion of work using established procedures.			

RECORD OF CONVERSATION

UEEEL0008 Evaluate and modify low voltage heating equipment and controls*. Core

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME** _____ **DATE:** ____/____/____

Question 16b: Explain how you have determined correct operation of direct current machines and the processes you follow when providing solutions derived from measurements and calculations.

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 16b			
Regularly uses voltage, current and resistance measuring devices in determining correct operation and solving problems in direct machines.	AS/NZS Wiring Rules 3000:2018 Electrical Safety Act Electrical Safety Regulations Code of Practice – Electrical work Standard Operating Procedures (SOP) Job Safety and Environmental Analysis (JSEA) Workplace documentation, policies and procedures		
Determines nature and scope of work, sources materials and coordinates work with others.			
Determines need to test or measure live and follows risk control measures as determined by regulatory requirements and safe working practices.			
Uses and selects appropriate tools, cables and accessories.			
Tests all equipment for correct operation and safety and isolates circuits according to established procedures.			
Uses established methods to solve circuit problems from measure and calculated values.			
Develops and alters existing direct current machines to comply with specified operating parameters.			
Applies control measures to electrical devices and machines operating at low voltage.			
Cleans work site, makes safe and notifies appropriate persons regarding completion of work using established procedures.			

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME** _____ **DATE:** ____/____/____

Question 17a: Explain how you have solved problems in low voltage heating equipment and the processes you follow when providing solutions derived from measured and calculated values.

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 17a			
Determines operating parameters of low voltage heating equipment	AS/NZS Wiring Rules 3000:2018 Electrical Safety Act Electrical Safety Regulations Code of Practice – Electrical work Standard Operating Procedures (SOP) Job Safety and Environmental Analysis (JSEA) Workplace documentation, policies, and procedures		
Determines nature and scope of work, sources materials and coordinates work with others.			
Determines need to test or measure live and follows risk control measures as determined by regulatory requirements and safe working practices.			
Uses and selects appropriate tools, cables, and accessories.			
Tests all equipment for correct operation and safety and isolates circuits according to established procedures.			
Uses established methods to solve circuit problems from measure and calculated values as they apply to low voltage heating equipment			
Determines conditions causing an existing low voltage heating equipment			
Develops and alters existing circuits to comply with specified operating parameters.			
Deals with unexpected situations safely by drawing on essential knowledge and skills to provide appropriate solutions.			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Cleans work site, makes safe and notifies appropriate persons regarding completion of work using established procedures.			
Demonstrates understanding of: • alternating current power principles • occupational health and safety principles • electrical safe working practices.			

RECORD OF CONVERSATION

UEEEL0009 Evaluate and modify low voltage lighting circuits, equipment and controls*. Core

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME** _____ **DATE:** ____/____/____

Question 17b: Explain how you have solved problems in low voltage lighting circuits, equipment and controls.and the processes you follow when providing solutions derived from measured and calculated values.

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 17b			
Determines operating parameters of low voltage lighting circuits, equipment and controls.	AS/NZS Wiring Rules 3000:2018 Electrical Safety Act Electrical Safety Regulations Code of Practice – Electrical work Standard Operating Procedures (SOP) Job Safety and Environmental Analysis (JSEA) Workplace documentation, policies, and procedures		
Determines nature and scope of work, sources materials and coordinates work with others.			
Determines need to test or measure live and follows risk control measures as determined by regulatory requirements and safe working practices.			
Uses and selects appropriate tools, cables, and accessories.			
Tests all equipment for correct operation and safety and isolates circuits according to established procedures.			
Uses established methods to solve circuit problems from measure and calculated values as they apply to low voltage heating equipment			
Determines conditions causing an existing low voltage lighting circuits, equipment and controls.			
Develops and alters existing circuits to comply with specified operating parameters.			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Deals with unexpected situations safely by drawing on essential knowledge and skills to provide appropriate solutions.			
Cleans work site, makes safe and notifies appropriate persons regarding completion of work using established procedures.			
Demonstrates understanding of: • alternating current power principles • occupational health and safety principles • electrical safe working practices.			

RECORD OF CONVERSATION

UEEEL0010 Evaluate and modify low voltage socket outlets circuits. Core

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME** _____ **DATE:** ____/____/____

Question 17c: Explain how you have solved problems in low voltage socket outlets circuits and the processes you follow when providing solutions derived from measured and calculated values.

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 17c			
Determines operating parameters in low voltage socket outlets circuits	AS/NZS Wiring Rules 3000:2018 Electrical Safety Act Electrical Safety Regulations Code of Practice – Electrical work Standard Operating Procedures (SOP) Job Safety and Environmental Analysis (JSEA) Workplace documentation, policies, and procedures		
Determines nature and scope of work, sources materials and coordinates work with others.			
Determines need to test or measure live and follows risk control measures as determined by regulatory requirements and safe working practices.			
Uses and selects appropriate tools, cables, and accessories.			
Tests all equipment for correct operation and safety and isolates circuits according to established procedures.			
Uses established methods to solve circuit problems from measure and calculated values as they apply to low voltage socket outlets circuits			
Determines conditions causing an existing circuit to be unsafe: electric shock hazard from indirect contract with conductive parts, insufficiently low impedance of a fault current path and inadequate fault protection.			
Develops and alters existing circuits to comply with specified operating parameters.			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Deals with unexpected situations safely by drawing on essential knowledge and skills to provide appropriate solutions.			
Cleans work site, makes safe and notifies appropriate persons regarding completion of work using established procedures.			
Demonstrates understanding of: • alternating current power principles • occupational health and safety principles • electrical safe working practices.			

RECORD OF CONVERSATION

UEEEL0012 Install low voltage wiring, appliances, switchgear and associated accessories.

Core

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME** _____ **DATE:** ____/____/____

Question 18: What are the types of wiring enclosures, cable support systems, cables, and accessories you have installed?

What are the processes you follow when installing and terminating cables and connecting wiring at accessories?

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 18	Workplace Health and Safety		

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Demonstrates use of ***at least three*** different wiring systems and applies regulatory requirements: • TPI cable in conduit or trunking • TPS circular or flat cable unenclosed • TPS circular cable unenclosed • SWA cable unenclosed • fire performance cables (e.g. MIMS, Radox). Has installed ***at least four*** of the following types of circuits and applies regulatory requirements: • control devices • fixed appliances/accessories • lighting and socket outlets • single/three phase motors and their controls • transformers and their controls • switchboards and/or distribution boards • protection and/or metering devices • d.c. machines and their controls.	Act: 1995 Queensland Electricity Safety Act Queensland Electricity Safety Regulations Electrical Code of Practice AS/NZS 3000:2018 Workplace documentation (component faults report, test results, parts/components dispatch, stores record) Service manuals Manufacturer's instructions for materials and equipment		
Uses range of cable support and mechanical protection devices and applies regulatory requirements: • clips, saddles, hangers, ties • metallic and non-metallic conduit • cable ducts, trunking, cable trays/ladder.			
Follows OHS and risk control procedures.			
Determines nature and scope of work, sources materials and coordinates work with others.			
Reads and interpreting drawings related to cable layouts, cable schedules and apparatus locations.			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Determines need to test or measure live and follows risk control measures as determined by regulatory requirements and safe working practices.			
Uses and selects appropriate tools, cables, and accessories.			
Tests all equipment for correct operation and safety and isolates circuits according to established procedures.			
Follows appropriate cable routes and installs cable and accessories to comply with standards, job specifications and established work practices.			
Accessories are installed straight and square in the required locations and within acceptable tolerances.			
Maintains fire integrity and terminates cables and accessories to manufacture's specs and regulatory requirements without waste or damage to equipment and uses sustainable energy practices.			
Tests and verifies installation to regulatory requirements.			
Cleans work site, makes safe, documents work and notifies appropriate persons regarding completion of work using established procedures.			
Deals with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions.			
Demonstrates understanding and applies knowledge and skills in: • power cable and conductor terminations • technical standards, regulations, and codes • electrical installation wiring, accessories, and equipment requirements.			

RECORD OF CONVERSATION

UEEEL0012 Install low voltage wiring, appliances, switchgear and associated accessories .

Core

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME** _____ **DATE:** ____/____/____

Question 19: What are the types of low voltage electrical apparatus and associated equipment you have installed and what processes have you followed when installing and connecting apparatus?

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 19			
Demonstrates appropriate experiences and skills in installing and connecting apparatus including ***at least four*** different electrical apparatus from list below: • motor staters and associated control devices • switchgear and control gear • protective devices; Control devices • fixed appliances/accessories • lighting and their controls and socket outlets • single and three phase motors and their controls • transformers and their controls; Metering devices • a c./d c. machines and their controls.	AS/NZS Wiring Rules 3000:2018 Electrical Safety Act Electrical Safety Regulations Code of Practice – Electrical work Standard Operating Procedures (SOP) Job Safety and Environmental Analysis (JSEA) Workplace documentation, policies and procedures Manufacturer's specifications and drawings		
Follows OHS and risk control procedures and determines nature and scope of work, sources materials and coordinates work with others.			
Reads and interpreting drawings related to cable layouts, cable schedules and apparatus locations.			
Determines need to test or measure live and follows risk control measures according to regulatory requirements and safe working practices.			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Uses and selects appropriate tools, cables and accessories and tests all equipment for correct operation and safety and isolates circuits according to established procedures.			
Installs and terminates apparatus and associated equipment to comply with standards, job specifications and established work practices (including maintaining fire integrity and placing and securing apparatus accurately).			
Installs apparatus without waste or damage to equipment and uses sustainable energy practices.			
Cleans work site, makes safe, documents work and notifies appropriate persons regarding completion of work using established procedures.			
Deals with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions.			
Demonstrates understanding and applies knowledge and skills in: • alternating current rotating machines • single and three phase transformers • luminaries and lighting systems • power cable and conductor terminations (assessed in G003B) • technical standards, regulations, and codes (assessed in G003B) • electrical installation wiring, accessories, and equipment requirements (assessed in G003B).			

RECORD OF CONVERSATION

UEEEL0039 Design, install and verify compliance and functionality of general electrical installations Core

☐ *Please tick this box to indicate if all prerequisites have been met. Prerequisites:* ***UEENEE/*** *E001B; E002B; E003B; E004B; E005B; E007B; E008B; E033B; G001B; G002B; G003B; G004B; G007B; G008B; G009B; and elective units as required, from Schedule 3 to a Strand Unit value of 6*

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME** _____ **DATE:** ____/____/____

Question 20: What have been the types of electrical installations that you have inspected and tested to verify whether is safe and complies with all requirements? Describe the process you undertake in verifying electrical installations for safety and regulatory compliance.

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 20	Electrical work permit (Electrical Safety Office) OTSR certificate (VETASSESS) ARTC certificate (Trades Recognition Australia) Electrical apprenticeship AS/NZS Wiring Rules 3000:2018 AS/NZS 3017 Electrical installations—Verification guidelines AS/NZS 3008 Electrical installations— Selection of cables		
Demonstrates appropriate experiences and skills in verifying compliance and functionality of: • main switchboards containing circuits for: o lighting o socket outlets o fixed appliances. • distribution boards. • circuits supplying a three-phase load.			
Follows OHS and risk control procedures and determines nature and scope of work, sources materials and coordinates work with others.			
Determines need to test or measure live and follows risk control measures according to regulatory requirements and safe working practices.			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Uses and selects appropriate tools, equipment and measuring devices are checked for correct operation and safety and isolates circuits according to established procedures.	AS/NZS 4836 Safe Working on LV Electrical Installations Electrical Safety Act Electrical Safety Regulations Code of Practice – Electrical work Standard Operating Procedures (SOP) Job Safety and Environmental Analysis (JSEA) Workplace documentation, policies and procedures Manufacturer's specifications and drawings Work permits and isolation orders		
Checks wiring for suitability to environment and checks if suitably protected from damage or overheating.			
Confirms cable conductor sizes meet current-carrying capacity requirements and voltage drop and fault-loop impedance limits.			
Validates protection methods and devices as meeting co-ordination requirements for overload and short-circuit protection.			
Validates switchgear and control gear as being appropriately rated and meeting functional requirement.			
Inspects electrical equipment for compliance with safety requirements. Checks earthing system components are correctly located and conductors correctly sized.			
Checks that marking on switchboards are clear and accurate and comply with requirements.			
Conducts mandatory tests for verification of: • earthing conductor resistance is sufficiently low • insulation resistance is sufficiently high • all polarities are correct • circuit connections are correct • fault-loop impedance is sufficiently low • residual current devices operate as intended.			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Identifies non-compliance defects are identified and reported in accordance with established procedures.			
Makes recommendations for rectifying defects in accordance with established procedures.			
Completes mandatory documentation in accordance with established procedures.			

RECORD OF CONVERSATION

UEEEL0018 Select wiring systems and select cables for low voltage electrical installations*

Core

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME** _____ **DATE:** ____/____/____

Question 21: What have been the types of electrical equipment that you have selected and arranged for general electrical installations?

Describe the process you undertake in selecting and arranging equipment for electrical installations.

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 21	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS 3000:2018 Workplace documentation (component faults report, test results, parts/components dispatch, stores record) Service manuals Manufacturer's parts catalogue		
Demonstrates appropriate experiences and skills in selecting and arranging equipment comprising: • main switchboards containing circuits for: o lighting o socket outlets o fixed appliances • distribution boards and • circuits supplying three-phase loads.			
Determines extent and nature of the electrical installation and follows safety and regulatory requirements.			
Arranges circuits to ensure safe and functional operation of the installation and to comply with technical standards and job specifications and requirements.			
Arranges circuits to ensure safe and functional operation of the installation and to comply with technical standards and job specifications and requirements.			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Selects wiring for: • suitability of environment • current-carrying capacity, voltage-drop and fault-loop impedance • Selects protection methods and devices to meet co-ordination requirements for overload and short-circuit protection.			
Selects switchgear and control gear to meet current, voltage and IP ratings and functional requirements.			
Selects earthing system components to meet requirements of the MEN system and obtains evidence that electrical equipment complies with safety requirements.			
Documents reasons for selections and arrangements made, including calculations and specifications for selected items in accordance with established procedures and forwards to appropriate person/s.			

RECORD OF CONVERSATION

UEEEL0014 Isolate, test and troubleshoot low voltage electrical circuits Core

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME** _____ **DATE:** ____/____/____

Question 22: What have been the types of faults you have found and repaired in low voltage electrical apparatus and circuits?

Describe the process you undertake when applying fault finding techniques for repair of low voltage electrical apparatus and circuits.

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 22			
Demonstrates appropriate range of experiences and skills in finding and repairing faults and their cause (***at least five***): • open circuit; short-circuit; incorrect connections; insulation failure; unsafe condition; apparatus /component failure; related mechanical failure. Finds and rectifies faults in a range of apparatus (at least ***four***): • control devices, fixed appliances, lighting; single and three phase motors, socket outlets; transformers, switchboards and/or distribution boards, protection and/or metering devices, a.c./d.c. machines and their controls. Finds and rectifies faults in a range of circuits that supply (***at least three***): • fixed appliances; lighting; single and three phase motors; socket outlets; machines and transformers; electronic or computer-based equipment.	Electrical work permit (Electrical Safety Office) OTSR certificate (VETASSESS) ARTC certificate (Trades Recognition Australia) Electrical apprenticeship AS/NZS Wiring Rules 3000:2018 AS/NZS 3017 Electrical installations—Verification guidelines AS/NZS 3008 Electrical installations— Selection of cables AS/NZS 4836 Safe Working on LV Electrical Installations		

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Determines likely extent of the fault and work from fault/breakdown reports and/or discussion with appropriate person/s and follows safety and regulatory requirements.	Electrical Safety Act Electrical Safety Regulations Code of Practice – Electrical work Standard Operating Procedures (SOP) Job Safety and Environmental Analysis (JSEA) Workplace documentation, policies, and procedures Manufacturer's specifications and drawings Work permits and isolation orders		
Determines need to test or measure live and follows risk control measures for hazards caused by fault.			
Uses appropriate tools and resources while applying methodical fault-finding techniques and draws on knowledge of a.c. circuits and apparatus using measured and calculated values of circuit/apparatus parameters.			
Conducts tests or measurements in strict accordance with OHS and electrical safe working requirements.			
Locates and finds faults efficiently and sources replacement parts and rectifies faults effectively.			
Tests apparatus without waste or damage to equipment and uses sustainable energy practices.			
Cleans work site, makes safe, documents work and notifies appropriate persons regarding completion of work using established procedures.			
Deals with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions.			

RECORD OF CONVERSATION

UEEEL0005 Develop and connect electrical control circuits Core

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME** _____ **DATE:** ____/____/____

Question 23: What have been the types of control circuits that you have developed and connected?

Describe the process you undertake in developing and connecting a control circuit including functional tests you have performed.

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 23	Electrical work permit (Electrical Safety Office) OTSR certificate (VETASSESS) ARTC certificate (Trades Recognition Australia) Electrical apprenticeship AS/NZS Wiring Rules 3000:2018 AS/NZS 3017 Electrical installations—Verification guidelines AS/NZS 3008 Electrical installations— Selection of cables AS/NZS 4836 Safe Working on LV Electrical Installations Electrical Safety Act		
Demonstrates satisfactory range of experiences in developing and connecting control circuits (***at least four*** from list below): • multiple light switching circuit • master control circuit • single stop-start circuit • multiple stop-start circuit • time controlled circuit • machine interlocked circuit • motor jogging circuit • machine safety circuit.			
Follows all OHS requirements and determines control scenarios and develops schematic arrangement of control circuits in accordance with established procedures.			
Determines need to test or measure live and follows risk control measures according to regulatory requirements and safe working practices.			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Uses and selects appropriate tools, cables and accessories and tests all equipment for correct operation and safety and isolates circuits according to established procedures.	Electrical Safety Regulations Code of Practice – Electrical work Standard Operating Procedures (SOP) Job Safety and Environmental Analysis (JSEA) Workplace documentation, policies, and procedures Manufacturer's specifications and drawings Work permits and isolation orders		
Connects control circuit components to comply with the agreed control scenario and tests circuit operation for agreed functionality and in strict accordance with OHS requirements and established safety procedures.			
Identifies and corrects non-compliant control functions and deals with unexpected situations safely and with the approval of an authorised person.			
Tests and connects control circuits efficiently without waste or damage to equipment and uses sustainable energy practices.			
Cleans work site, makes safe, documents work using standard drawing conventions and notifies appropriate persons regarding completion of work using established procedures.			

RECORD OF CONVERSATION

UEEIC0013 Develop, enter and verify discrete control programs for programmable controllers*. Group A Elective

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME** _____ **DATE:** ____/____/____

Question 24

a) Discuss your actions in carrying out your obligations and responsibilities prior to commencing work. As well as work preparation include your obligations and responsibilities under current OH&S legislation.

b) You are required to determine a control system scenario from job specifications of the process/ plant machine/ to be controlled through consultation with appropriate person(s)

c) Describe the preparation to develop and verify the program.

d) Describe how you would develop control system and enter and test program.

e) Discuss the requirements to verify, document and report programming activities.

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 24			

KEY POINTS The candidate's response should evidence the following	INDUSTRY REQUIREMENTS These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	COMMENTS Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
A) • Knows and applies OH&S procedures. • Understands risk analyses process and applies 'order of risk reduction', i.e., elimination of risk a priority. • Confirms machines are isolated where necessary. • Control solutions are developed and documented. • Developed control system is converted to an appropriate form such as flow state and ladder diagram. • Program is entered into the programmable control using a personal computer and appropriate soft ware • Appropriate methods and tools are used to test control systems and operating faults and anomalies are identified and rectified. • Methods of dealing with unexpected situations are selected on the basis of safety and specified work outcomes.	OH&S Legislation Codes of Practice - Electrical Work – Electrical Safety Act 2002 Manufacturer's specifications – Equipment Licensing		
B) • OHS work completion risk control measures and procedures are followed. • Program is transferred from a programmable controller to an external medium for storage. • Control system specification documented • Work completion is reported, and appropriate personnel notified in accordance with established procedures.			
C) • Understands the requirements for correctly setting up a PLC • Understands the control methodology behind plc integration into the workplace			

RECORD OF CONVERSATION

UEEEL0020 Solve problems in low voltage a.c. circuits. Core

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME** _____ **DATE:** ____/____/____

Question 25: See Below

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 25	Electrical Safety Act 2002 Electrical Safety Regulation 2002 Electrical Safety Act 2002 (ESA) Code of Practice – Electrical Work Workplace Health and Safety Act 1995 Workplace Health and Safety Regulation 2008 Workplace Health and Safety Act Codes of Practice as applicable AS/NZS3000:2007 Sustainable Energy		
• Demonstrate an understanding of Alternating quantities for example RMS values and frequency of sinusoidal waveforms			
• Demonstrates an understanding phasor diagram including 'in phase' 'out of phase' 'phase angle' 'lead' and 'lag'			
• Application of ohms law to determine voltage, current or reactance. Show understanding of RC and RL in a series AC circuit encompassing impedance and impedance triangle and RLC series circuits.			

KEY POINTS The candidate's response should evidence the following	INDUSTRY REQUIREMENTS These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	COMMENTS Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
• Show understanding of parallel AC circuits encompassing the determination of branch currents that contain RL, RC in two branches, the total circuit impedance, the total current by phasors and phase angle.	principles and practices Effective communication Workplace documentation		
• Show understanding of power in an AC circuit encompassing the difference between true power, apparent power, reactive power. List their units of measurement and define the term 'power factor' and phase angle.			
• Explain how power factor can be improved.			
• What are harmonics?			
• What problems arise from the effects of harmonics?			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
• Demonstrate an understanding of the relationship of voltages in a multiphase system and explain the term 'phase sequence' or 'phase rotation'			
• What do we mean by the term 'fault loop impedance?			
• Show understanding of a three-phase star connected system encompassing phase relationship between line and phase voltages and line and phase currents. • Show understanding of a three-phase delta connected system encompassing phase relationship between line and phase voltages and line and phase currents. • What is the purpose for measuring power, energy, power factor and maximum demand of a.c. power systems and loads?			

RECORD OF CONVERSATION

UEEAS0007 Assemble, mount and connect control gear and switchgear. Group A Elective

CANDIDATE'S NAME:_____ ASSESSOR'S **NAME** _____ **DATE:** ____/____/____

Question 26: What have been the types of switchgear and control gear you have installed and connected for control panels and switchboards? Explain the processes you follow in selecting, installing, and connecting switchgear and control gear.

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 26	Electrical work permit (Electrical Safety Office) OTSR certificate (VETASSESS) ARTC certificate (Trades Recognition Australia) Electrical apprenticeship AS/NZS Wiring Rules 3000:2018 AS/NZS 3017 Electrical installations—Verification guidelines AS/NZS 3008 Electrical installations— Selection of cables AS/NZS 4836 Safe Working on LV Electrical Installations Electrical Safety Act AS/NZS Switchboard		
Meets regulatory requirements to undertake electrical work (electrical licence, electrical work permit, apprenticeship or performs electrical work under a "prescribed place of work" as defined by the Electrical Safety Act section18 d)			
Demonstrates satisfactory range of experiences in installing and connecting switchgear and control gear (in ***at least two*** different control panels) and includes all equipment and apparatus from list below: • busbars • bus ties • isolators • current transformers • voltage transformers • core balance protective devices • HRC Fuses • meters and measuring equipment • air circuit breakers and/or oil circuit breakers.			
Follows OHS and risk control procedures and determines nature and scope of work from wiring diagrams, sources materials and coordinates work with others			

KEY POINTS The candidate's response should evidence the following	INDUSTRY REQUIREMENTS These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	COMMENTS Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Determines need to test or measure live and follows risk control measures according to regulatory requirements and safe working practices.	standards Electrical Safety Regulations Code of Practice – Electrical work Standard Operating Procedures (SOP) Job Safety and Environmental Analysis (JSEA) Workplace documentation, policies and procedures Manufacturer's specifications and drawings Work permits and isolation orders		
Uses and selects appropriate tools, cables and accessories and tests all equipment for correct operation and safety and isolates circuits according to established procedures.			
Follows assembly instructions and correctly fits and connects switchgear/control gear without damage and follows quality procedures, standards/codes and job specifications.			
Tests completed switchboard against work instructions and industry standards and in strict accordance with OHS risk control measures.			
Follows procedures for non-routine events and carries out work without waste or damage to equipment and uses sustainable energy practices.			
Cleans work site, makes safe, documents work and notifies appropriate persons regarding completion of work using established procedures.			

RECORD OF CONVERSATION

UEECS0033 Use engineering applications software on personal computers*.

Group A Elective

CANDIDATE'S NAME:_____ **ASSESSOR'S NAME:**_____ **DATE:** ____/____/____

Question 27: What types of computer applications you have used in your work environment, and outline the steps you take in using computer applications including how information is used, files stored and forwarded?

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 27			
Examples provided indicate that ***at least three*** of the applications listed are routinely used: • word processing • spread sheet • drawings • business management • apparatus set-up • email.	Work safety practices Standard operating procedures Vendor computer application instruction manual		
Processes routinely followed include: • switching computer on to established procedures • applying user preferences and uses help directory • adds, alters or deletes information in accordance with user instructions • produces and prints engineering related reports • stores/files engineering related reports • forwards engineering related reports using email • names, saves and print files/documents • shuts down computer correctly • uses essential knowledge and skills to deal with anomalies and unplanned events.			

RECORD OF CONVERSATION

UETDRRF004 Perform rescue from a live LV panel Core

CANDIDATE'S NAME:_____ ASSESSOR'S NAME _____ **DATE:** ____/____/____

Question 33: Demonstrate how to rescue a workmate from a live LV panel

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 33	Electrical Safety Act Electrical Safety Regulations Code of Practice – Electrical work Standard Operating Procedures (SOP) Job Safety and Environmental Analysis (JSEA) Workplace documentation, policies, and procedures ESI Safety Practice and Relevant High Voltage Safety Standards of Energy Supply Authorities ESI Training Materials http://www.iqytechnicalcollege.com/Form71ESILesson.htm		
(a) How will you prepare to perform rescue procedures from live LV?			
(b) Demonstrate how to carry out rescue from live LV panel			
(c) Provide your plan regarding the processes for reporting accidents and/or incidents to authorised personnel in accordance with established procedures			
• Instruction in hazards and risk control measures for specific work functions and work areas are			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
identified and obtained • Electricity isolation point is identified and labelled, where appropriate • Tools and emergency equipment are checked for safety, functionality and placed in an accessible location to facilitate response and rescue according to established procedures • Workplace procedures and work instructions for controlling risk are followed • Workplace procedures for accessing and isolating the LV panel and removing the victim, where necessary, from contact with live apparatus are followed • Workplace procedures for applying cardiopulmonary resuscitation (CPR), if required at the site, and gaining access to treatment by a medical professional, if necessary, are followed • The worksite is secured and entry controlled until appropriate authorities inspect and release the site • Processes for reporting accidents and/or incidents to authorised personnel are confirmed in accordance with established procedures			

RECORD OF CONVERSATION

UEERE0001 Apply environmentally and sustainable procedures in the energy sector. Core

CANDIDATE'S NAME:_____ **ASSESSOR'S NAME:**_____ **DATE:** ____/____/____

Question 29: Provide examples of the sustainable work practices that you have used in the workplace.

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 29	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2018 Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation Workplace policies and procedures		
Implements techniques which reduces energy usage directly or indirectly. Minimises waste of material or damage to surrounding environment. Involves others to communicate suggestions for improvements to workplace practices to minimise energy and materials wastage. Dealing with unplanned events.			
Evidence of understanding of sustainable work practices include: • effects of neglecting sustainable work practice • greenhouse effect - causes, consequences. • international and national greenhouse imperatives • role of regulators and similar bodies • economic benefits of sustainable initiatives. Techniques for reducing carbon produced energy and hence greenhouse gases: • domestic, commercial and industrial strategies • trade related technologies and methods • energy efficient retrofits (overview) • renewable energy technologies (overview). • Energy efficiency			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.

RECORD OF CONVERSATION

UEECO0023 Participate in electrical work and competency development activities. Core

CANDIDATE'S NAME: _____ **ASSESSOR'S NAME:** _____ **DATE:** _____

Question 30: How have you monitored your competency development and ensured your progression of knowledge and skills was maintained?

***Note**: This unit of competency is designed for an apprentice/learner in employment-based programs covered by an approved contract of training. To RPL in this unit the assessor must therefore establish that the candidate has been actively participating in own competency development to the level of performance required by this unit. Where gap training is required (from other Appliance Servicing units) to gain qualification, assessor can use this opportunity to collect additional relevant evidence from candidate for support of this unit.*

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 30	Workplace Health and Safety Act: 1995 Queensland Electricity Act Queensland Electricity Safety Regulations Electrical Code of Practice AS/NZS 3000:2018 Workplace documentation (service report, test results, parts/components dispatch, stores record Service manuals Manufacturer's instructions for materials and equipment		
Identified and confirmed training practices, requirements, administration costs and support service policies and procedures provided by training organisation.			
Identified and confirmed the context, requirements, and responsibilities of a competency development plan.			
Has clarified how particular work is carried out and the procedures involved.			
Identified and confirmed the critical industry, enterprise and regulatory policies, procedures, and context applicable to work activities.			
Has requested assistance to overcome difficulties when developing competency.			
Progressed successfully against periodic or staged evaluative performance events.			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Reported periodically the competency development activities in accordance with requirements.			
Met obligations by periodically reviewing progress of competency development and modified through consultation with appropriate persons.			
Competency development reports validated by an appropriate person.			
Pursued strategies for developing opportunities in gaining range of workplace experiences and exposure.			
Dealt with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions.			
Demonstrates understanding of: • responsibilities under a competency development plan • exposure requirements to scope of workplace activities and equipment • methods of monitoring and reporting competency development activities • workplace evidence reporting and review • workplace evidence validation • periodic evaluation of competency development progress • enterprise work activities policies and procedures.			

RECORD OF CONVERSATION

UEEEL0003 Arrange circuits, control and protection for electrical installations Core

CANDIDATE'S NAME: _____ **ASSESSOR'S NAME:** _____ **DATE:** _____

Question 31:

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 31	Codes of Practice Safety NSW Work Cover AS/NZS3000:2018 AS/NZS 3018 Electrical Safety Act Electrical Safety Regulations Code of Practice – Electrical work Standard Operating Procedures (SOP) Job Safety and Environmental Analysis		
Safe work practices			
Protection against overload and earth fault protection			
Factors that determine the number and type of circuits in the installation.			
Devices for protection against direct and indirect contact.			
Earthing arrangements for example MEN systems, protective earth and functional earthing			
Devices for Automatic disconnection.			
Causes of under voltage and effects on the system.			

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Switching arrangements for example local isolation and emergency situations.	(JSEA) Workplace documentation, policies, and procedures ESI Safety Practice and Relevant High Voltage Safety Standards of Energy Supply Authorities		
CT metering and application.			
Requirements of single and three phase metering			
Circuit arrangements, compliance requirements (includes location, access, identification and marking, arc fault protection and construction suitability			
Control arrangement for complete installations with or without with or without safety services and an alternate supply. Switch types current, voltage and IP rating			

RECORD OF CONVERSATION

HLTAI009 Provide cardiopulmonary Resuscitation Core

CANDIDATE'S NAME: _____ **ASSESSOR'S NAME:** _____ **DATE:** _____

Question 32: Demonstrate cardiopulmonary resuscitation to workmate who suffers the serious injury.

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 32	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2018 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Low Voltage Rescue First Aid and CPR Elevated Work Platforms Permit		
Respond to an emergency situation			
Recognise and assess an emergency situation.			
Ensure safety for self, bystanders and casualty.			
Assess the casualty and recognise the need for cardiopulmonary resuscitation (CPR).			
Seek assistance from emergency services			
Perform CPR procedures			
Perform CPR in accordance with the ARC guidelines			

KEY POINTS The candidate's response should evidence the following	INDUSTRY REQUIREMENTS These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	COMMENTS Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Display respectful behaviour towards casualty			
Operate an automated external defibrillator (AED) according to manufacturers' instructions			
Communicate details of the incident.			
Accurately convey incident details to emergency services.			
Report details of incident in line with appropriate workplace or site procedures.			
Maintain privacy and confidentiality of information in line with statutory or organisational policies.			
Review the incident.			

RECORD OF CONVERSATION

UEEEL0047 Identify, shut down and restart systems with alternate supplies. Core

CANDIDATE'S NAME: _____ **ASSESSOR'S NAME:** _____ **DATE:** _____

Question 34: When the main power is outage, how will you identify, shut down and restart the system with alternate supplies.

KEY POINTS The candidate's response should evidence the following	**INDUSTRY REQUIREMENTS** These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	**COMMENTS** Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
Question 34	Codes of Practice Manufacturer's Instructions AS/NZS 3000 NSW Electrical Service Rules ESI Safety Practice and Relevant High Voltage Safety Standards of Energy Supply Authorities ESI References http://www.iqytechnicalcollege.com/Form71ESILesson.htm		
(a) How will you prepare to work on systems with alternate supplies?			
(b) How do you identify and isolate alternate supplies?			
(c) Provide the sample of your complete work and document records			

KEY POINTS The candidate's response should evidence the following	INDUSTRY REQUIREMENTS These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	COMMENTS Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
• Nature of the installation is obtained from appropriate written documentation, electrical drawings and/or relevant person/s to determine the scope of work			
• WHS/OHS workplace procedures are obtained, interpreted and applied			
• Hazards are identified, risks are assessed, and control measures are implemented			
• Tools, equipment and circuit testing devices are obtained and checked for correct operation and safety in accordance with workplace procedures			
• Work supervisor is consulted to ensure work is coordinated effectively with others			
• Labelling indicating generation system/s connected on site is located, interpreted and checked against electrical diagram			
• Switchboard, circuits and known supply are identified			
• Site procedures for isolation and shutdown are obtained and interpreted			
• Circuit to be isolated is identified and tested			

KEY POINTS The candidate's response should evidence the following	INDUSTRY REQUIREMENTS These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	COMMENTS Record other key points and examples from conversation. Identify whether a practical assessment is warranted.
• Shutdown procedures are completed in accordance with industry standards and workplace procedures			
• Isolation of energy sources is completed and proved in accordance with workplace procedures, industry standards and regulatory requirements			
• Systems are inspected and tested for compliance with industry and regulatory standards			
• Battery storage system integrity is checked in accordance with industry standards and regulatory requirements			
• System is re-instated after isolation			
• WHS/OHS work completion risk control measures and procedures are followed			
• Worksite is cleaned and made safe in accordance with workplace procedures			
• Work completion is documented, electrical drawings are updated, and relevant personnel are notified in accordance with workplace procedures and regulatory requirements			

KEY POINTS The candidate's response should evidence the following	INDUSTRY REQUIREMENTS These must be evidenced in the candidate's response	Indicate if response addresses KP and IR	COMMENTS Record other key points and examples from conversation. Identify whether a practical assessment is warranted.

32	**Task 33** **Practical** Practical demonstration of <u>1.Respond to an emergency situation</u> 1.1. Recognise and assess an emergency situation. 1.2. Ensure safety for self, bystanders and casualty. 1.3. Assess the casualty and recognise the need for cardiopulmonary resuscitation (CPR). 1.4. Seek assistance from emergency services <u>2. Perform CPR procedures.</u> 2.1. Perform CPR in accordance with the ARC guidelines. 2.2. Display respectful behaviour towards casualty. 2.3. Operate an automated external defibrillator (AED) according to manufacturers' instructions. <u>3. Communicate details of the incident.</u> 3.1. Accurately convey incident details to emergency services. 3.2. Report details of incident in line with appropriate workplace or site procedures. 3.3. Maintain privacy and confidentiality of information in line with statutory or organisational policies	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit

	4.Review the incident. 4.1. Recognise the possible psychological impacts on self and other rescuers and seek help when required. 4.2. Contribute to a review of the first aid response as required.	

UEEEL0047 Identify, shut down and restart systems with alternate supplies** **Core**	34.When the main power supply is broken down, provide the work procedure to identify, shut down and restart the system with alternate supply

SECTION D

Written Assessments / Exams

Not Included

SECTION E

Practical Tasks and Observation Recording Sheets

You use this section to assist you in determining a candidate's competency in those areas where they have not yet successfully demonstrated their skills, knowledge and prior experience. Therefore, candidates are not required to complete all tasks. You select tasks after considering available evidence collected through previous phases and according to context and needs of each candidate.

PRACTICAL TASKS
UEE30820 Certificate III in electrotechnology electrician

NOTE to assessors – Ensure all assessment resources are available for applicant. Applicant is encouraged to use own tools and meters. Tasks chosen must be completed to specified performance standard. Where knowledge or skill is demonstrated at below industry standard performance level, the assessor is to record as a skill gap.

All practical tasks require a risk assessment with appropriate documentation completed

Note: It is not the intention that all tasks must be completed. The assessor is to choose the task/s that will confirm candidate's knowledge and application of skills to provide sufficient evidence to make a judgment of competence

Unit of Competency	Practical Task
UEECD0007 Apply work health and safety regulations, codes and practices in the workplace **Core**	**Task 1** You have received a service call to perform electrical repairs in a customer's factory. The factory supervisor informs you that you will be working within proximity to moving automated equipment next to a switch board. Explain the steps you would take to ensure the safety of yourself and others, before, during and after entering the work area. **Task 2** Describe the procedures that you would use to remove someone from what is believed to be a live electrical situation.
UEECD0016 Document and apply measures to control WHS risks associated with electrotechnology work **Core**	**Task 3** Using risk assessment and control documentation from your workplace or as provided by the assessor, complete the documentation for a jobsite you are about to begin work in. • Jobsite location to be agreed upon by assessor and candidate After completion of documentation an unforseen hazard (chosen by the assessor) has now been identified. Complete document variations and implement new risk control measures
UEECD0019 Fabricate, assemble and dismantle utilities industry components **Core**	**Task 4** This task requires you to show your assessor how you assemble and disassemble electrotechnology components using a variety of tools. The assessor will discuss with you an appropriate job to complete either in your work place or in a simulated environment. Source an assembly/ disassembly specification and select tools and equipment and complete your normal steps.

	Task 5 This task requires you to show your assessor how you fabricate electrotechnology components using a variety of fabrication tools. The assessor will discuss with you an appropriate job to complete either in your work place or in a simulated environment. Source a fabrication procedure specification and select tools and equipment and complete your normal steps. In addition, you are to demonstrate how you sharpen drill bits for two different types of materials.
UEECD0046 Solve problems in single path circuits **Core**	**Task 6** This task will enable you to demonstrate to the assessor your ability to solve ELV circuit problems by the use of measuring instruments and calculations. In your workplace or in a simulated environment develop and connect an ELV circuit that includes a circuit protection device, switch, resistive load and ELV supply. By measurement determine actual power dissipated by load. By calculation determine a suitable resistor to reduce the voltage across the load by 50%, and then connect resistor into the circuit and retest. Once task is completed provide responses to your assessor for the following questions: • What are the effects of electrical current? • What are other sources of electrical energy and how are they produced? • What are the possible causes of loss of supply to a load?
UEECD0020 Fix and secure electrotechnology equipment **Core**	**Task 7** This task requires you to demonstrate to your assessor how you fix and secure electrotechnology equipment in the workplace. The assessor will discuss with you an appropriate fixing and securing job to complete either in your workplace or in a simulated environment.
UEECD0051 Use drawings, diagrams, schedules, standards, codes and specifications **Core**	**Task 8** These tasks will enable you to demonstrate to the assessor your ability to use electrical, mechanical and site drawings. **8 a)** Using drawings from your workplace or as provided by the assessor, read, interpret and explain details and functions of symbols of the drawings. **8 b)** Based on the drawings supplied neatly freehand draw a variation as outlined by the assessor. **Task 9** Using freehand drawing skills neatly draw a control circuit that activates a relay using stop and start switches. Also draw a three-dimensional electrical enclosure to house this circuit, according to the assessor's requirements.

UEECD0044
Solve problems in multiple path circuits

Core

Task 10

10 a)

Practical

This task will allow you to demonstrate how you are able to **solve problems in multipath d.c. circuits**. The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to:

- Develop and connect a d.c. series – parallel circuit.
- Determine the operating parameters using measured and calculated values.
- Alter circuit to specified operating parameters.
- Deal with an unplanned event using essential knowledge and skills to provide appropriate solutions.

Your assessor will discuss with you the appropriate equipment, resources and location for demonstration.

All OHS, risk assessment and isolation procedures must be followed using safe work procedures and will be monitored when performing all tasks.

10 b)

Theory

This task will allow you to demonstrate your understanding of d.c. electrical principles as applied to solving problems in multipath d.c. circuits.

Your demonstration will include providing knowledge of:

- factors that affect resistance
- effects of resistance on cables
- resistor types, characteristics, power ratings and applications
- specifying resistors according to application
- colour coded resistor identification
- procedures for connecting series / parallel d.c. circuits:
    - Measuring and calculating values and solving problems using resistance, voltage, current and power calculations
- voltage drops, resistance and applied voltage relationships including voltage divider network
- voltage and current levels of cells connected in series, in parallel and in series/parallel
- relationship between currents entering and leaving a junction and resistance relationships
- relationship between voltages, currents, and resistances in a bridge network
- hazards involved in using electrical instruments and safety control measures
- meter selection and operating characteristics of digital and analogue meters
- measuring resistance using direct, voltammeter and bridge methods
- field instruments and measurement applications
- capacitance, units of and how stores charge
- capacitance, voltage, and charge relationships
- behaviour of series resistance/capacitance circuits
- hazards and safety control measures for capacitance effects
- factors effecting capacitance values and effects of capacitors connected in series and in parallel
- testing of capacitors to determine serviceability.

UEEEL0023 Terminate cables, cords and accessories for low voltage circuits **Core**	**Task 11** **11 a)** **Practical** This task will allow you to demonstrate how you **lay wiring /cabling and terminate accessories for extra-low voltage in power and control circuits**. The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to: • scope work and material requirements • select appropriate tools, cables, and accessories • follow appropriate cable routes • install cable and accessories to requirements • terminate cables and accessories to manufacture's specifications and requirements • clean and make safe worksite • apply communication protocols on completion of work using established procedures. Your assessor will discuss with you the appropriate equipment, resources, and location for demonstration. **All OHS, risk assessment and isolation procedures must be followed using safe work procedures and will be monitored when performing all tasks.** **11 b)** **Theory** This task will allow you to demonstrate your understanding of: • cable protection and support • cable types and applications • cables in buildings, structures, and premises • basic cable and conductor terminations • technical standards, regulations, and codes for extra-low voltage work • environmental and heritage awareness. You are required to provide a written or verbal response to the assessor detailing your understanding and knowledge of: **1. Cable protection and support** • Requirements to protect and support cables adequately: o mechanical damage, adverse temperatures, corrosion, and magnetic fields • Types of cable support and protection devices, accessories, and typical applications: o metallic and non-metallic conduits, duct and trunking, cable ladder and tray, cable, clips and ties and related accessories • Installation techniques encompassing: o cable installation equipment o cable drawing and hauling techniques **2. Demonstrate understanding of cable types and applications and include knowledge of:** • Structural components of cables and their purpose including: o conductors and conductor material; insulation; sheathings and servings o application of various cable types.

	• Cable types: o single cables, flexible cables, flexible cords, shielded cables, armoured cables, ribbon cables, other similar and like cables. • Typical characteristics and use of power circuit cables and control circuit cables. **3. Demonstrate understanding of cables in buildings, structures and premises and include knowledge of:** • building construction method and construction sequence • typical cable routes through buildings, structures and premises • building codes affecting the installation of cables in buildings, structures and premises: o building codes include limitation on penetration of structural elements and maintenance of fire protection interiority. • Cable segregation requirements. **4. Demonstrate understanding of basic cable and conductor terminations and include knowledge of:** • insulation removal and replacement • conductor handling and cable terminations encompassing: o general aspects and soldering involving pins on electronic components and stranded conductors carrying current up to 25 amperes o application of connecting devices for conductors and terminals o continuity through connections and insulation resistance testing o stress release on cables/conductors. **5. Demonstrate understanding of technical standards, regulations and codes for extra low voltage work and include knowledge of:** • limitation imposed by regulations • reading and applying standards • aspects of technical Standards that apply to extra-low voltage work. **6. Demonstrate understanding of environmental and heritage awareness and include knowledge of:** • purpose of environmental and heritage regulations • typical issues affecting electrotechnology services and systems • meeting requirements.
UEEEL0021 Solve problems in magnetic and electromagnetic devices **Core**	**Task 12** **12 a)** **Practical** This task will allow you to demonstrate how you **determine correct operation of electromagnetic circuits and providing solutions** as they apply to electrical installations and equipment. The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to: • Determine the operating parameters of an existing electromagnetic circuit. • Listing control measures that apply to electrical devices and machines operating at low voltage.

	• Correctly and safely using voltage, current and resistance measuring devices and providing solutions derived from measurements and calculations to predictable problems in electromagnetic circuits. • Altering an existing electromagnetic circuit to comply with specified operating parameters. • Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions. Your assessor will discuss with you the appropriate equipment, resources, and location for demonstration. **All OHS, risk assessment and isolation procedures must be followed using safe work procedures and will be monitored when performing all tasks.**
UEEEL0019 Solve problems in direct current (d.c.) machines **Core**	**Task 12** **12 b)** **Theory** This task will allow you to demonstrate your understanding of **electromagnetic principles, d.c. machines** and **electrical safe working practices.** **I)** You are required to provide a written or verbal response to the assessor detailing your understanding and knowledge of **electromagnetic principles** including: • principles of magnetic shielding and its application • practical uses in electromagnets • force between current-carrying conductors • magnetic losses and the resulting effects on the performance of electrical machines • electromagnetic induction and types of inductors • self-inductance, mutual inductance, and factors affecting inductance growth/decay of current in an inductor and time constant of a series L-R circuit • application of electromagnetic principles • hazards and situations associated with induced voltages
UEEEL0008 Evaluate and modify low voltage heating equipment and control **Core**	**Task 13** **13 a)** **Practical** This unit involves the skills and knowledge required to evaluate and modify low voltage (LV) heating equipment and controls. The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to: • work safely, • identify faults in heating equipment, • repair heating equipment, • ensure all work complies with relevant Australian Standards and legislation, and completing work and documenting activities.. Your assessor will discuss with you the appropriate equipment, resources, and location for demonstration. **All OHS, risk assessment and isolation procedures must be followed using safe work procedures and will be monitored when performing all tasks.**

	The tasks • Testing water heater • Testing control thermostat • Interpret the water heater wiring diagram and connection • Note water heater specifications • Rectify the fault
UEEEL0009 Evaluate and modify low voltage lighting circuits, equipment and controls **Core**	**Task 13** **13 b)** **Practical** This unit involves the skills and knowledge required to evaluate and modify low voltage (LV) lighting circuits, equipment and controls. The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to: • work safely, • identify faults in luminaires and associated control equipment, • repair/replace luminaire and control equipment components, • ensure all work complies with relevant Australian Standards and legislation • complete work and documenting activities. Your assessor will discuss with you the appropriate equipment, resources, and location for demonstration. **All OHS, risk assessment and isolation procedures must be followed using safe work procedures and will be monitored when performing all tasks**
UEEEL0010 Evaluate and modify low voltage socket outlets circuits **Core**	This unit involves the skills and knowledge required to evaluate and modify low voltage (LV) socket outlets circuits. **Task 13** **13 c)** **Practical** The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to: • work safely, • identify and repaire/replacing faulty socket outlets, • ensure all work complies with relevant Australian Standards and legislation complete work and documenting activities

UEEEL0012 Install low voltage wiring, appliances, switchgear and associated accessories Part 1- Install low voltage wiring, appliances **Core**	**Task 14** **14 a)** **Practical** This task will allow you to demonstrate how you **install wiring and accessories for a low voltage final sub circuit (lighting, socket outlet or appliance) and verify circuit for connection to supply**. The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to: • Read and interpret drawings related to cable layouts, cable schedules and apparatus locations. • Routing, placing, and securing cables to comply with requirements. • Placing and securing accessories accurately. • Maintaining fire integrity. • Terminating cable and conductors to comply with requirements. • Deal with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions. Your assessor will discuss with you the appropriate equipment, resources, and location for demonstration. **All OHS, risk assessment and isolation procedures must be followed using safe work procedures and will be monitored when performing all tasks.** **14 b)** **Theory** This task will allow you to demonstrate your understanding of: • power cable and conductor terminations • technical standards, regulations, and codes for general electrical installations • electrical installations, wiring and accessories • electrical wiring systems • electrical installation, equipment requirements. You are required to provide a written or verbal response to the assessor detailing your understanding and knowledge of: **1) Power cable and conductor terminations:** • types of cable glands and their application • terminal types and applications • conductor and cable termination techniques. **2) Applying Standards, regulations, and codes for general electrical installations:** • protection for safety • installation design, selection, and installation of electrical equipment • testing and verification. **3) Electrical installations, wiring and accessories.** • standards, codes, and requirements applicable to installing wiring and accessories. • techniques for installing wiring and accessories.

Continued	**4) Electrical wiring systems:** Regulatory requirement for the installation of: • flat and circular TPS cables • cable enclosures such as metallic and non-metallic conduit and trunking • fire related cable • armoured cable • catenary supported cables and pendant-type socket outlets. Installation methods used for: • exposed circular TPS cable of a final sub circuit (lighting, socket outlet, appliance) • TPI cable enclosed in conduit and trunking, of a final sub circuit (lighting, socket outlet, appliance) • fire related cable, of a final sub circuit (lighting, socket outlet, appliance) • armoured cable of a final sub circuit for a socket outlet or appliance • catenary support cable system of a final sub circuit (lighting, socket outlet, appliance) • requirements for testing final sub circuit for connection to supply. Aerial conductors including: • pole/post/strut selection; conductor selection and spacing • clearance requirements and safety measures. Underground wiring including: • categories, cables, enclosures, depth • protection and other safety measures. **5) Electrical installations, equipment requirements** • Standards, codes, and requirements applicable to installing electrical equipment • typical locations for various equipment • terminal configuration for connection of phase, neutral and earthing.
UEEEL0012 Install low voltage wiring, appliances, switchgear and associated accessories **Part 2** Install appliances, switchgear and associated accessories for low voltage electrical installations **Core**	**Task 15** **15 a) Practical** This task will allow you to demonstrate how you **install and connect electrical apparatus** and associated equipment to comply with industry standards and regulatory requirements. Examples of apparatus for this demonstration can be: o motor staters and associated control devices o switchgear and control gear o protective devices; Control devices o fixed appliances/accessories o single and three phase motors and their controls o transformers and their controls o metering devices. The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to: o read and interpret drawings related to cable layouts, cable schedules and apparatus locations o placing and securing apparatus accurately o maintaining fire integrity o terminating and connecting apparatus and associated equipment to comply with requirements. o deal with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions.

	Your assessor will discuss with you the appropriate electrical apparatus, resources, and location for demonstration. **All OHS, risk assessment and isolation procedures must be followed using safe work procedures and will be monitored when performing all tasks.** **15 b) Theory** This task will allow you to demonstrate your understanding of: • alternating current rotating machines • single and three phase transformers • luminaries and lighting systems. You are required to provide a written or verbal response to the assessor detailing your understanding and knowledge of: **1. Alternating current rotating machines** including: • three phase motor principles and operation characteristics • protection requirements of motors against overcurrent and undervoltage. • purpose of limiting starting current of machines • connection methods of three phase starters • wiring Rules and service rule requirements • three phase induction motor controls – speed control, starting and braking methods • single phase motor principles and characteristics • single phase motor construction • single phase motor applications • fault testing • three-phase synchronous machine types, construction, and operating principles • three-phase synchronous machines loading and excitation effect • single phase synchronous machine types, construction, and operating characteristics.
	2. Single & three-phase transformers including: • transformer construction and operating principles • transformer parameters: ratings, impedance, voltage regulation, losses, efficiency • cooling methods, auxiliary equipment • instrument transformers: current and voltage transformers, safety techniques • transformer connections • parallel operation: polarity markings, loading and connections • harmonics in transformers: causes, problems, and solutions • high voltage isolation: isolation procedures, access permits, clearances, ‘step’ and ‘touch’ potential **3. Luminaires and lighting systems** including: • types and applications of luminaires • operating principles and connection arrangements • installation and operating requirements and limitations • typical fault symptoms and related conditions of lighting circuits: • testing techniques • supply authority requirements for lighting circuits: • requirements for power factor correction • evacuation lighting systems: types, Building Codes and Standards requirements, maintenance requirements.

UEEEL0039 Design, install and verify compliance and functionality of general electrical installations **Core**	**Task 16** **16 a)** **Practical** This unit involves the skills and knowledge required to design, install, inspect and test to verify an electrical installation is safe and complies with regulatory requirements. The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to do the tasks in • working safely; • designing, installing, • commissioning and fault finding of electrical installations; • visual inspections and mandatory testing; • following workplace procedures; and completing mandatory reporting requirements. • demonstrating currency for regulatory purposes may be required to undertake this unit to demonstrate their currency with verification of compliance requirements • possession of sufficient to evidence current knowledge of applicable standards and regulations. The skills and knowledge described in this unit require a licence or permit to practice in the workplace where work is carried out on electrical installations which are designed to operate at voltages greater than 50 volt (V) alternating current (a.c.) or 120 V direct current (d.c.). . Your assessor will discuss with you the appropriate resources and location for demonstration. **All OHS, risk assessment and isolation procedures must be followed using safe work procedures and will be monitored when performing all tasks.** **16 b)** **Theory** **<u>1.Prepare to design, install, inspect and test an electrical installation</u>** 1.1 WHS/OHS control measures for the site are identified and applied 1.2 WHS/OHS risk control measures and workplace procedures are followed in preparation for work 1.3 Safety hazards, which have not previously been identified, are noted and risk control measures are implemented 1.4 Installation documentation and/or relevant industry standard are reviewed and applied 1.5 Appropriate person/s is consulted to ensure work is coordinated with others

	involved on the worksite 1.6 Need to test or measure live electrical work is determined in accordance with WHS/OHS requirements and conducted in accordance with workplace safety procedures 1.7 Circuits, machines and/or plant are isolated in accordance with WHS/OHS job requirements and workplace procedures 1.8 Installation of wiring, appliances, switchgear, control gear and associated accessories is planned and appropriately sequenced in consultation with relevant person/s 1.9 Locations of appliances, switchgear, accessories and cable routes are planned within the constraints of building structure, other services, specifications and regulatory requirements 1.10 Tools, equipment and testing devices needed to verify compliance are obtained in accordance with workplace procedures and checked for correct operation and safety 1.11 Preparatory work is checked to ensure it complies with planned specifications and no damage has occurred **2.Select wiring systems, cables, control and protection for general electrical installations** 2.1 Wiring system is selected and suitable for the environments in which it will operate 2.2 Cable conductor sizes are selected to meet current-carrying capacity requirements and voltage-drop and earth fault-loop impedance limitations in accordance with relevant industry standards 2.3 Protective devices are selected to meet the required switching and tripping currents coordination and discrimination for overload and short circuit protection in accordance with relevant industry technical standards 2.4 Earthing system components are selected to meet multiple earthed neutral (MEN) system in accordance with relevant industry standards 2.5 Residual current devices (RCDs) are selected to meet the required circuit switching and tripping currents in accordance with relevant industry technical standards 2.6 Switchgear/control gear is selected to meet current and voltage requirements and confirmed suitable for environmental conditions (ingress protection (IP) ratings) and functional requirements 2.7 Switchboards are arranged to accommodate control and protective devices, links, safety services and other distributor equipment in accordance with relevant industry technical standards **3 Install low voltage (LV) wiring and associated accessories** 3.1 Wiring and accessories are installed and terminated to comply with technical standards and job specifications and requirements 3.2 Cables and conductors are terminated at accessories in accordance with manufacturer specifications and regulatory requirements 3.3 Ongoing compliance and safety inspection of installed wiring systems and testing of installed circuits is undertaken 3.4 Defects revealed through ongoing compliance and safety inspection and tests are rectified

	4.Install and connect LV Appliances, switchgear and accessories appliances, switchgear 4.1 Appliances, switchgear and accessories are installed to comply with technical standards and job specifications and requirements with sufficient access to affect terminations, adjustment and maintenance 4.2 Wiring is terminated at appliances, switchgear and accessories in accordance with manufacturer specifications and functional and regulatory requirements 4.3 Ongoing compliance and safety inspections of the installed appliances, switchgear and accessories are undertaken 4.4 Defects revealed through ongoing compliance and safety inspection are rectified **5 Visually inspect and conduct safety testing on electrical installation** 5.1 Wiring is checked for suitability within the environments in which it is installed to ensure it is suitably protected from damage or overheating in accordance with relevant industry standards 5.2 Cable conductor sizes are compliant with current-carrying capacity, voltage-drop and fault-loop impedance limitations in accordance with relevant industry standards 5.3 Protection methods and devices are verified as meeting coordination requirements for overload and short-circuit protection in accordance with relevant industry standards 5.4 Switchgear and control gear rating is verified as being appropriate and meets functional requirements in accordance with relevant industry standards 5.5 Electrical equipment inspection and testing evidence is cited and verified in accordance with WHS/OHS safety regulations 5.6 Earthing system and components are located correctly, and conductor selection sizes are verified 5.7 Markings on switchboards are checked for accuracy and clarity and comply with requirements 5.8 Mandatory tests are conducted in accordance with relevant industry standards 5.9 Testing is conducted to verify fault-loop impedance is sufficiently low and RCDs operate in accordance with relevant industry standards **6.Report inspection and test findings** 6.1 WHS/OHS risk control work completion measures and procedures are followed 6.2 Worksite is cleaned and made safe in accordance with workplace procedures 6.3 Non-compliance defects are identified and reported in accordance with workplace procedures 6.4 Recommendations for rectifying defects are made in accordance with workplace procedures 6.5 Mandatory documentation is completed in accordance with workplace procedures

UEEEL0018 Select wiring systems and select cables for low voltage electrical installations* **Core**	**Task 17** **17 a)** **Practical** This task requires you to demonstrate how you **Select wiring systems and cables for low voltage general electrical installations**. Selection and arrangement of equipment will be demonstrated as they apply to an electrical installation containing a main switchboard that supplies lighting circuits, socket outlet circuits fixed appliance circuits and a three-phase connected load. The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to: • arrange electrical installations to comply with safety and other regulatory and functional requirements • select appropriate type and size of cables • select protection methods and devices that meet co-ordination requirements for overload and short-circuit protection • select switchgear and control gear that meet current, voltage and IP ratings and functional requirements • select appropriate earthing components • document installation arrangement, specification for items selected and reasons for the selections made. Your assessor will discuss with you the appropriate resources and location for demonstration. **All OHS, risk assessment and isolation procedures must be followed using safe work procedures and will be monitored when performing all tasks.** **17 b)** **Theory** You are required to provide a written or verbal response to the assessor detailing your understanding and knowledge of: • electrical control devices • technical standards, regulations and codes for special electrical installations • technical manuals and catalogues • protection devices and applications • switchboards/distribution boards • electrical installations, safety principles and requirements • electrical installations, protection methods and devices • electrical installations, circuit arrangements and equipment selection. Your assessor will discuss with you the extent of demonstration and will supply appropriate assessment material for collecting evidence of your knowledge and skills as they relate to the unit **UEENEEG107A Select wiring systems and cables for low voltage general electrical installations**.
UEEEL0014 Isolate, test and troubleshoot low voltage electrical circuits* **Core**	**Task 18** **18 a)** **Practical** This task requires you to demonstrate how you **Trouble-shoot and repair faults in low voltage electrical apparatus and circuits** using appropriate fault-finding techniques.

	The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to: • determine the likely extent of the fault from breakdown reports and using discussion to elicit information on the fault/breakdown with appropriate person/s • use appropriate tools and resources, and methodical fault-finding techniques • locate and find faults efficiently • conduct tests or measurements in strict accordance with OHS and electrical safe working requirements • rectify faults effectively • report and complete documentation correctly • deal with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions. Your assessor will discuss with you the appropriate resources and location for demonstration. **All OHS, risk assessment and isolation procedures must be followed using safe work procedures and will be monitored when performing all tasks.** **18 b)** **Theory** You are required to provide a written or verbal response to the assessor detailing your understanding and knowledge of: • fault finding techniques • lighting fundamentals • electrical heating • electronic components and systems, industrial applications Your assessor will discuss with you the extent of demonstration and will supply appropriate assessment material for collecting evidence of your knowledge and skills as they relate to the unit "G008B Trouble-shoot and repair faults in low voltage electrical apparatus and circuits".
UEEEL0005 Develop and connect electrical control circuits* **Core**	**Task 19** **10 a)** **Practical** This task requires you to demonstrate how you **Develop and connect electrical control circuits** and test for correct functionality. Control circuits from the list below may be chosen for the exercise: • multiple light switching circuit • single stop-start circuit • multiple stop-start circuit • time controlled circuit • machine interlocked circuit • motor jogging circuit. The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to: • determine control scenarios • develop schematic arrangement of control circuits • connect control circuit function correctly • identify and correct non-compliant control functions • document 'as-connected' control circuit

	• deal with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions. Your assessor will discuss with you the appropriate resources and location for demonstration. **All OHS, risk assessment and isolation procedures must be followed using safe work procedures and will be monitored when performing all tasks.** **10 b)** **Theory** You are required to provide a written or verbal response to the assessor detailing your understanding and knowledge of: Control circuit fundamentals including: • conversion of circuit diagrams • design and connection of control circuits • sequence of operation of basic control circuits • electrical control devices. Your assessor will discuss with you the extent of demonstration and will supply appropriate assessment material for collecting evidence of your knowledge and skills as they relate to the unit **UEEEL0005** Develop and connect electrical control circuits

UEEEL0025 Test and connect transformers. **Core**	**Task 20 a)** This written task will allow you to demonstrate your understanding of essential knowledge and associated skills as they relate to **UEEEL0025** Test and connect transformers**.** <u>Single and three phase transformers</u> • Outline the types of laminations and core construction of transformers. • Outline the different winding styles/ types used in transformers. • Describe transformer auxiliary equipment and their functions. • List applications for transformers. • Describe the principles of mutual induction of a transformer. • Outline the factors that determine induced voltage of a transformer winding. • Determine the value of a transformer's secondary voltage and current given one winding's electrical details and turns ratio. • Identify voltage and current components of a phaser diagram for a transformer on no-load. • Identify the safety features specified in AS/NZS3000 with respect to transformers and isolating transformers. • What is the purpose of a risk analysis and how would you conduct one? • Describe how you would prevent/limit environmental damage during the normal course of your workday. • Describe the tests which allow the power losses of a transformer be determined. • Describe the methods used for natural and forced cooling of transformers. • Outline the reasons for voltage variation in the output of a transformer • Explain the term "Percentage Impedance" • Determine the percentage impedance by calculation. • Outline the conditions/ restrictions required before connecting two transformers in parallel. • Describe the precautionary methods when connecting and disconnecting instrument transformers. • Outline applications for auto transformers and instrument transformers.
UEEEL0024 Test and connect alternating current (a.c.) rotating machines **Core**	**Task 20 b)** This written task will allow you to demonstrate your understanding of essential knowledge and associated skills as they relate to **UEEEL0024** Test and connect alternating current (a.c.) rotating machines <u>Alternating current rotating machines</u> • Describe the grip rule and Flemings left and right rule • Describe the relationship between rotor speed, slip and rotor frequency • Describe the basic component of a three-phase induction motor and the types of rotors used. • Explain the three phase motor connections in both star and delta. • Describe the dead tests performed on an AC rotating machine. • Outline the common types of single-phase motors. • Describe the basis construction and characteristics of a split phase induction motor. • Describe the principal operation of single phase capacitor start, capacitor start/ run and PSC motors. Explain how to reverse each of the motors outlined in previous point.

	Task 20c) Motor Protection. Outline the reasons for motor protection and the requirements specified in AS/NZS3000. Explain the adverse effect of repetitive starting and/ or reversing motors. Explain the operating principles of phase failure protection. Describe the selection process for suitable protective devices for a given motor and starter combination.
	Task 20 d) Alternators and generators Discuss the principles of operation of a synchronous motor/ alternator and an asynchronous generator (induction generator). Describe the methods of excitation for a synchronous machine. Describe the different types of prime movers used with single and three phase machines. Provide applications of single and three phase portable/ standby alternators. Describe construction details of single and three phase portable/ standby alternators and common faults found in portable/ standby alternators.
UEEAS0007 Assemble, mount and connect control gear and switchgear **Core**	**Task 21** This task requires you to demonstrate how you select, **assemble, mount and connect switchgear and control gear** and test against work instructions and industry standards. Equipment and apparatus from list below will be chosen for the exercise: • Busbars and bus ties • Isolators • Current and voltage transformers • Core balance protective devices • HRC Fuses • Meters and measuring equipment • Air circuit breakers and/or oil circuit breakers. • Relays, contactors, motor starters The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to: • Follow assembly instructions • Correctly select and place, switchgear, and control gear • Make connections without damaging switchgear/control • Adhere to quality procedures • Deal with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions • Labelling /identification • Use of terminal strips to assist fault finding • Component layout encompassing schematic diagrams with power and control circuits. • Choice of control and switchgear encompassing voltage and current ratings • Equipment and layout methods. Your assessor will discuss with you the appropriate resources and location for demonstration.

	All OHS, risk assessment and isolation procedures must be followed using safe work procedures and will be monitored when performing all tasks. **Theory** You are required to provide a written or verbal response to the assessor detailing your understanding and knowledge of switchgear and control gear to an extent indicated by the following aspects: • types and applications • operating principles • interlocking systems • control and protection • installation requirements • Regulations, Standards and Codes.
UEECS0033 Use engineering applications software on personal computers* **Group A Elective**	**Task 22** This task will allow you to demonstrate how you **use computer applications in the workplace** or in a simulated environment. You are required to • correctly switch on computer • open a spreadsheet and develop a materials list based on the last service job you performed (or list as advised by assessor) • create an invoice in a Word document • save and print the documents • open email and type information detailing what the documents are • attach documents and forward • shutdown computer correctly.
UEERE0001 Apply environmentally and sustainable procedures in the energy sector **Core**	**Task 25** This task will allow you to demonstrate your knowledge of and how you **apply sustainable work practices**. You are required to identify and outline the sustainable work practices that occur on your work site and to include what techniques are used to reduce energy and how materials wastage is minimised. Your assessor will discuss with you a typical unplanned event that may occur in your work area, and you will need to outline the steps you would take in managing situation.

UEECO0023 Participate in electrical work and competency development activities **Core**	**Task 26** This task will allow you to demonstrate how you **monitor your competency development** and ensure you **maintain progression of knowledge and skills** in accordance with your gap training plan. Based on the requirements of your gap training plan you are to: • Demonstrate understanding of your training schedule, support service provisions and administration costs. • Confirm the context, requirements, and responsibilities of a competency development plan • Ensure you seek clarification of how particular work is carried out and the procedures involved (work record book entry). • Identify and confirm the critical industry, enterprise and regulatory policies, procedures, and context applicable to work activities. • Ensure you request assistance to overcome difficulties when developing competency (work record book entry). • Progress successfully against periodic or staged evaluative performance events and report and review your competency development activities and modifying development activities through consultation with supervisor and assessor. • Have competency development reports validated by an appropriate person. • Pursue strategies for developing opportunities in gaining range of workplace experiences and exposure. • Deal with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions.
UEEEL0003 Arrange circuits, control and protection for electrical installations* **Core**	**Task 27** This task will allow you to demonstrate how you arrange circuits, control and protection for general electrical installations and test against work instructions and industry standards. Equipment and apparatus from the list below will be chosen for the exercise. • Switchboard • RCD's • RCBO's • MCB's The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to: • Demonstrate an understanding of circuit arrangements, control and protection of electrical installations that comply with Wiring Rules and Service Rules. Your assessor will discuss with you the appropriate resources and location for demonstration. All OHS, risk assessment and isolation procedures must be followed using safe work procedures and will be monitored when performing all tasks. You are required to provide a written or verbal response to the assessor detailing your understanding and knowledge of Arrange circuits, control and protection for general electrical installations indicated by the following aspects: • Safety principles with reference to Section 1 of the Wiring Rules and deemed to comply requirements from Section 2 to 8. • Calculation of Maximum Demand • Consideration for the number and type of circuits

	• Protection methods (Direct) • Protection methods (Indirect) • Earthing system • Protection devices against overload and short circuit • Coordination requirements between protective devices and conductors • Devices for automatic disconnection • Fault loop impedance • Switch types, current and voltage and IP rating and where these apply • Switchboards and their requirements encompassing metering, physical circuit arrangements, identification and marking.
UEEEL0020 Solve problems in low voltage a.c. circuits **Core**	**Task 28 (a)** **Practical (A)** This task will allow you to demonstrate how you determine correct operation of low voltage AC circuits. The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to: • Develop and connect an AC series parallel LRC circuit, take resistance, voltage, and current measurements, and using measured or given values show relationships between components (impedance triangle). • Alter circuit to improve power factor. • Determine conditions that may cause an existing circuit to be unsafe. Your assessor will discuss with you the appropriate equipment, resources, and location for demonstration. All OHS, risk assessment and isolation procedures must be followed using safe work procedures and will be monitored when performing all tasks. **Theory (B)** This task will allow you to demonstrate your understanding of alternating current power circuits. You are required to provide a written or verbal response or where online testing may be applicable. This will be forwarded to the assessor detailing your understanding and knowledge of alternating current power circuits. • Generation of a sinusoidal voltage and phase relationships; r.m.s values, peak values, instantaneous values, time period and frequency. • Phaser diagrams and relationship between voltage and current in an AC circuit.

	• Inductance in ac circuits, inductive reactance; relationship between inductive reactance and frequency. • Relationship between capacitive reactance and frequency • AS/NZS 3000 requirements for the installation of capacitors • Definition of “impedance” • Determining the impedance of series, and series parallel circuits and diagrams showing the relationship between resistive, inductive, and capacitive components (impedance triangle). • Phaser diagram to solve problems and show the relationship between V and I • Relationship between resonance, frequency, and the effect on current in series resonance and parallel resonance conditions; applications where resonance is applied. • Difference between true power, apparent power and reactive power and the units. • Multiphase system and voltages generated by single and multiphase alternators • Generation of three phase r.m.s. values and the determination of phase sequence. • Effects of low power factor and AS/NZS 3000 Requirements and power factor improvement equipment. • Define the term “power factor’ and phase angle. • List and explain methods to improve “power factor • Determine the branch currents of a parallel circuit that contain RL, RC or LC in two branches. • Use a phasor diagram to determine the total circuit current and phase angle in parallel RL, RC or LC circuits • Define “Harmonics” and the relationship it has on a sinusoidal wave form of an AC power system. • Explain the condition when a circuit is in “resonance”. • Dangers of parallel and series resonant circuits. • Explain the purpose of a neutral conductor • The effects of high impedance in the neutral conductor supplying an unbalanced load. • AS/NZS 3000 requirements of neutral conductors. • Three phase delta and star system connections, I and V phase relationships. • Determine r.m.s, value of line and phase current relationships of a star/delta connected system. • Determine r.m.s, value of line and phase voltage relationship of a star / delta connected system. • Effects of phase reversal on a star / delta system. • Purpose and methods used for measuring power, energy, power factor and maximum demand of AC power systems and loads. • Term fault loop impedance of an AC power system.

	• Measure fault loop impedance of typical circuits • Procedures for testing fault loop impedance.
	Task 28 b **Practical** This task will allow you to demonstrate how you **determine correct operation of single and three phase circuits and solve circuit problems**. The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to: • Develop and connect an a.c. series parallel LRC circuit, take resistance, voltage and current measurements and using measured or given values show relationship between components (impedance triangle). • Alter circuit to improve power factor. • Determine conditions that may cause an existing circuit to be unsafe. Your assessor will discuss with you the appropriate equipment, resources, and location for demonstration. **All OHS, risk assessment and isolation procedures must be followed using safe work procedures and will be monitored when performing all tasks.** **Theory** This task will allow you to demonstrate your understanding of **alternating current power principles.** You are required to provide a written or verbal response to the assessor detailing your understanding and knowledge of **alternating current power principles** including: • generation of a sinusoidal voltage and phase relationships; r.m.s. values and frequency • Phasors diagrams and relationship between voltage drops and current in a resistive a.c. circuit • inductance in a.c. circuits; inductive reactance; relationship between inductive reactance and frequency • examples of inductive components, phase shift effect; current limiting characteristics of inductors • relationship between capacitive reactance and frequency • examples of capacitive components their effect on the phase relationship between V and I • definition of 'impedance' • impedance of series, parallel and series-parallel circuits and diagrams showing the relationship between resistive, inductive, and capacitive components (impedance triangle) • voltage, current or impedance values from measured or given values of any two of these quantities • Phasor diagram to solve problems and show the relationship between V and I • relationship between resonance, frequency, and the effect on current in series resonance and parallel resonance conditions; applications where resonance is applied ……. /cont.

	• difference between true power, apparent power and reactive power and the units • effects of low power factor and AS/NZS 3000 requirements and power factor improvement equipment • multiphase system and voltages generated by single and multiphase alternators • generation of three-phases, r.m.s. values and the determination of phase sequence • three-phase star system connections, I and V phase/line relationships and r.m.s. value of line and phase V and I • examples of balanced and unbalanced loads in typical power systems • purpose of the neutral conductor in three-phase four wire systems • effects of a high impedance in the neutral conductor supplying an unbalanced load • value and phase relationship of neutral current in unbalanced three-phase four wire systems given line currents and power factors • AS/NZS 3000 requirements regarding neutral conductors • three-phase delta system connections, I and V phase/line relationships • determine r.m.s. value of line and phase voltage and current • example of delta-connection loads in typical power systems • relationship between line and phase voltages and line and phase currents in a system with a star-connected supply device and a delta-connected load • relationship between line and phase voltages and line and phase currents in a system with a delta-connected supply device and a star-connected load • purpose and methods used for measuring power, energy, power factor and maximum demand of a.c. power systems and loads • power factor improvement of a three-phase installation • harmonics in an a.c. power system; sources that produce harmonics and problems caused by harmonics and how these are overcome.
	Task 28 c **Practical** This task will allow you to demonstrate how you **determine correct operation of single and three phase circuits and solve circuit problems**. The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to: • Develop and connect an a.c. series parallel LRC circuit, take resistance, voltage and current measurements and using measured or given values show relationship between components (impedance triangle). • Alter circuit to improve power factor. • Determine conditions that may cause an existing circuit to be unsafe. Your assessor will discuss with you the appropriate equipment, resources, and location for demonstration. **All OHS, risk assessment and isolation procedures must be followed using safe work procedures and will be monitored when performing all tasks.** **Theory** This task will allow you to demonstrate your understanding of **alternating current power principles.** You are required to provide a written or verbal response to the assessor detailing your understanding and knowledge of **alternating current power principles** including: • generation of a sinusoidal voltage and phase relationships; r.m.s. values and

	frequency • Phasors diagrams and relationship between voltage drops and current in a resistive a.c. circuit • inductance in a.c. circuits; inductive reactance; relationship between inductive reactance and frequency • examples of inductive components, phase shift effect; current limiting characteristics of inductors • relationship between capacitive reactance and frequency • examples of capacitive components their effect on the phase relationship between V and I • definition of 'impedance' • impedance of series, parallel and series-parallel circuits and diagrams showing the relationship between resistive, inductive, and capacitive components (impedance triangle) • voltage, current or impedance values from measured or given values of any two of these quantities • Phasor diagram to solve problems and show the relationship between V and I • relationship between resonance, frequency, and the effect on current in series resonance and parallel resonance conditions; applications where resonance is applied • difference between true power, apparent power and reactive power and the units • effects of low power factor and AS/NZS 3000 requirements and power factor improvement equipment • multiphase system and voltages generated by single and multiphase alternators • generation of three-phases, r.m.s. values and the determination of phase sequence • three-phase star system connections, I and V phase/line relationships and r.m.s. value of line and phase V and I • examples of balanced and unbalanced loads in typical power systems • purpose of the neutral conductor in three-phase four wire systems • effects of a high impedance in the neutral conductor supplying an unbalanced load • value and phase relationship of neutral current in unbalanced three-phase four wire systems given line currents and power factors • AS/NZS 3000 requirements regarding neutral conductors • three-phase delta system connections, I and V phase/line relationships • determine r.m.s. value of line and phase voltage and current • example of delta-connection loads in typical power systems • relationship between line and phase voltages and line and phase currents in a system with a star-connected supply device and a delta-connected load • relationship between line and phase voltages and line and phase currents in a system with a delta-connected supply device and a star-connected load • purpose and methods used for measuring power, energy, power factor and maximum demand of a.c. power systems and loads • power factor improvement of a three-phase installation • harmonics in an a.c. power system; sources that produce harmonics and problems caused by harmonics and how these are overcome.

UETDRRF004 Perform rescue from a live LV panel* **Core**	**Task 29** **Practical** This unit covers the performance of rescue procedures from live low voltage (LV) apparatus, not including overhead lines and underground cables in the workplace The practical demonstration of Rescuing a person from a live LV panel in the context of transmission, distribution or rail work functions. The responsibilities for health, safety and risk management processes at all operative levels and adherence to safety practices as part of the normal way of doing work. o
UEEIC0013 Develop, enter and verify discrete control programs for programmable controllers* **Group A Elective**	**Task 30** **Practical** Develop enter and verify discrete control programs for programmable controllers. Observation on site. Practical Tasks: Candidate needs to list verbally the WH&S essential requirements relating to the task of developing, verifying, and implementing a program for a programmable controller. Show evidence at workplace of control system development and data entry and final test run or operational function. Identify functions applied/ implemented and adaptions introduced when necessary. Without interference of established system, indicate method(s) used for system storage and backup facilities.
HLTAID009 Provide cardiopulmonary resuscitation **Core**	**Task 31** **Practical** This unit applies to all persons who may be required to provide CPR, in a range of situations, including community and workplace settings, 1.Respond to an emergency situation 1.1. Recognise and assess an emergency situation. 1.2. Ensure safety for self, bystanders and casualty. 1.3. Assess the casualty and recognise the need for cardiopulmonary resuscitation (CPR). 1.4. Seek assistance from emergency services 2. Perform CPR procedures. 2.1. Perform CPR in accordance with the ARC guidelines. 2.2. Display respectful behaviour towards casualty. 2.3. Operate an automated external defibrillator (AED) according to manufacturers' instructions.

	3. Communicate details of the incident. 3.1. Accurately convey incident details to emergency services. 3.2. Report details of incident in line with appropriate workplace or site procedures. 3.3. Maintain privacy and confidentiality of information in line with statutory or organisational policies 4.Review the incident. 4.1. Recognise the possible psychological impacts on self and other rescuers and seek help when required. 4.2. Contribute to a review of the first aid response as required.
UEEEL0047 Identify, shut down and restart systems with alternate supplies* **Core**	**Task 32** **Practical** This unit involves the skills and knowledge required to identify, shut down and restart systems with alternate supplies. The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to • identify the system configuration, • work safely with electricity generation systems and inverters, • identify hazards and controlling the associated risks, • isolate and test for de-energisation, • reinstate the system after isolation • complete relevant documentation.

OBSERVATION RECORDING SHEET

Practical Tasks

CANDIDATE'S NAME: _____ SIGNATURE**:** _____ **DATE:** _____

ASSESSOR'S NAME: _____ SIGNATURE**:** _____ **DATE:** _____

LOCATION: _____

NB: The skills listed below must be verified by a competent assessor through observed demonstration either in the candidate's workplace as part of the candidate's normal work duty OR as part of a practical assessment/demonstration set by the assessor.

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEECD0007 Apply work health and safety regulations, codes and practices in the workplace. Core					
1	Obtains and applies WH&S instructions in specified work functions and work areas. Applies enterprise policies and procedures to all work. Follows safety instructions where provided. Consults others in identifying hazards and implementing and monitoring control measures. Establishes appropriate risk control measures. Processes and interprets job plans and sets out sequence of activities. Works comfortably with other crew members. Prioritises work and adapts to problem situations.	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
1	Asks questions of supervisors and colleagues. Discusses problems with supervisors, colleagues, and industry representatives. Obtains and apply instructions, work permits, clearances and isolation permissions from supervisors. Prepares for electrical and non-electrical isolation to established procedures. Considers and acts on environmentally friendly working methods. Leaves the worksite clear of debris and waste and stores equipment. Monitors condition of equipment, tools, and meters to regulatory requirements.	Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Low Voltage Rescue CPR Elevated Work Platforms Permit Emergency evacuation procedures			
2	Isolate supply, if possible, avoid becoming another victim. Call for help (000). If unable to turn off supply, disconnect the victim from the electricity supply by the use of dry non-conducting material, e.g., rescue hook. Avoid direct skin to skin contact. Move/drag victim to safe area (with rescue hook). Smother fire (if any). Assess the victim's condition. Apply, if necessary, CPR and/or treatment of injuries: • 2 breathes per 30 compressions at a rate of 100 per minute. Place in recovery position. Monitor victim. Record and report incident.	CPR LVR LVR rescue kit			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
	Follows all workplace procedures for an emergency situation.				
UEECD0019 Fabricate, assemble and dismantle utilities industry components Core					
4	Performs risk assessment and completes documentation. Reads and interprets specifications correctly. Selects and safely uses a variety of appropriate tools and techniques (hand and power). Marks or tags components to ensure correct assembly. Replaces or repairs components to manufacturer specifications. Stores parts to protect against loss or damage. Works with minimising waste of materials. Follows appropriate techniques for close fitting parts. Assembles to manufacturer's user guides and completes task to established procedures and techniques.	Electrical Safety Act & Regulations Electrical Code of Practice Manufacturer's instructions for materials and equipment Correct use of MSDS data Engineering references/ specifications, plans, drawings Workplace documentation Workplace policies and procedures			
5	Performs risk assessment and completes documentation Follows drawings and instructions accurately. Sources suitable materials to established procedures Calculates and measures accurately for component dimensions from information given in job drawings and instructions. Selects and safely uses a variety of appropriate tools and techniques (hand and power): • cutting • shaping • drilling • threading and tapping Sharpens drills correctly to manufacturer's specifications.				

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
	Fabricates components efficiently minimising waste of materials and damage to environment and services. Performs routine quality checks.				
UEECD0020 Fix and secure electrotechnology equipment. Core					
7	Selects the appropriate hand and power tools. Selects the appropriate fixing devices according to suitability of the load, environment, and the material structure they are to be installed. Fixed and secured to: • industry time frames • minimise wastage and disposes according to workplace practice • prevent damage to surrounding environment • Sustainable Energy principles and practices. Shows knowledge and understanding of environment and building regulation including the protocols for working in and around protected environments and heritage sites.	Workplace Health and Safety Act: 1995 Queensland Electricity Act Queensland Electricity Safety Regulations Electrical Code of Practice AS/NZS 3000:2007 Workplace documentation (SOP) Engineering references - specifications plans and drawings Workplace documentation Environmental and building regulation Manufacturer's instructions for materials and equipment			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEECD0051 Use drawings, diagrams, schedules, standards, codes and specifications Core					
8	Correctly reads and interprets given drawings: • symbols and functions • drawing layouts • conventions and symbols • dimensions • location of equipment • schematics and wiring diagrams • cable schedules • termination schedule • site and architectural drawings and plans • services, apparatus plant and machinery.	Workplace Health and Safety Act: 1995 Queensland Electricity Act Queensland Electricity Safety Regulations Electrical Code of Practice AS/NZS 3000:2007 Workplace documentation (SOP) Engineering references - specifications plans and drawings Workplace documentation Environmental and building regulation Manufacturer's instructions for materials and equipment			
9	Uses drawing conventions in neat freehand drawing: • electrical (Symbols, lines, layouts, naming conventions) • mechanical (3 dimensional and 2 dimensional planes).				

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEECD0016 Document and apply measures to control WHS risks associated with electrotechnology work. Core					
3	Identifies and documents hazards using appropriate processes while consulting with other. Identifies risk classification to established procedures: • high (potential to kill) • medium (potential to cause injury) • low (potential to cause minor injury). Develops control measures to eliminate risk according to classification • uses different approaches to work or redesign • fixes defective equipment • PPE. Seeks agreement on control measures and documents. Understands principles and legal responsibilities and regulatory requirements in managing hazards and assessing risks in the workplace. Monitors and reviews control measures and modifies in consultation with others. Makes changes to documentation for unforseen hazards. Files documentation according to established procedures.	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEECO0023 Participate in electrical work and competency development activities Core					
26	• Responsibilities under a competency development plan • Methods of monitoring and reporting competency development activities • Enterprise work activities policies and procedures	Competent performance with inherent safe working practices is expected in the industry to which this 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 skills described in this unit.			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEECD0046 Solve problems in single path circuits Core					
6	• Using methodological techniques to solve single path d.c. circuit problems from measure and calculated values • Determining the operating parameters of an existing circuit. • Altering an existing circuit to comply with specified operating parameters. • Developing circuits to comply with a specified function and operating parameters. • Dealing with unplanned events	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEENEEE104A - Solve problems in d.c. circuits Core					
10	• Using methodological techniques to solve multi path d.c. circuit problems from measure and calculated values • Determining the operating parameters of an existing circuit. • Altering an existing circuit to comply with specified operating parameters. • Developing circuits to comply with a specified function and operating parameters. • Dealing with unplanned events	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEEEL0025 Test and connect transformers Core					
20a	• Determining the operating parameters of existing transformer.. • Altering an existing machine to comply with specified operating parameters. • Developing transformer circuit to comply with a specified function and operating parameters. • Determining the cause of low efficiency in an existing machine. • Determining conditions causing an existing circuit to be unsafe. • Dealing with unplanned events	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEEEL0024 Test and connect alternating current (a.c.) rotating machines*Core					
20 b c d	• Determining the operating parameters of existing machines. • Altering an existing machine to comply with specified operating parameters. • Developing machines/circuits to comply with a specified function and operating parameters. • Determining the cause of low efficiency in an existing machine. • Determining conditions causing an existing circuit to be unsafe. • Dealing with unplanned events	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEEEL0008 Evaluate and modify low voltage heating equipment and controls Core					
13a	• Testing water heater • Testing control thermostat • Interpret the water heater wiring diagram and connection • Note water heater specifications • Rectify the fault	Competent performance with inherent safe working practices is expected in the industry to which this 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 skills described in this unit.			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEEEL0009 Evaluate and modify low voltage lighting circuits, equipment and controls Core					
13b	• Basic electrical concepts • Basic electrical circuit • Ohm's Law • Electrical power • Effects of electrical current • EMF sources energy sources and conversion electrical energy • identify faults in luminaires and associated control equipment, • repair/replace luminaire and control equipment components, • ensure all work complies with relevant Australian Standards and legislation • complete work and documenting activities.	Competent performance with inherent safe working practices is expected in the industry to which this 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 skills described in this unit.			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEEEL0010 Evaluate and modify low voltage socket outlets circuits Core					
13c	• work safely, • identify and repaire/replacing faulty socket outlets, • ensure all work complies with relevant Australian Standards and legislation complete work and documenting activities	Competent performance with inherent safe working practices is expected in the industry to which this 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 skills described in this unit.			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEEEL0003 Arrange circuits, control and protection for electrical installations Core					
	• Determining the extent and nature of the installation for job specifications • Obtaining and understand the safety and other regulatory requirements to which the electrical installation shall comply • Determining individual load requirements. • Arranging and terminate circuits, control, and protective devices to comply with all requirements • Selecting circuit protective devices residual current device that comply with all requirements. • Selecting switchgear and control gear that meet current, voltage and IP ratings and functional requirements. • Obtaining evidence of compliance for the equipment selected • Documenting installation arrangement, specification for items selected and reasons for the selections made. • Dealing with unplanned events	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEEEL0021 Solve problems in magnetic and electromagnetic devices Core					
12a	• Using methodological techniques to solve problems in circuits with an electromagnetic device from measure and calculated values • Determining the operating parameters of an existing circuit with an electromagnetic device. • Alternating an existing circuit with an electromagnetic device to comply with specified operating parameters. • Developing circuits with electromagnetic devices to comply with a specified function and operating parameters. • Dealing with unplanned events	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEEEL0019 Solve problems in direct current (d.c.) machines Core					
12b	• Using methodological techniques to solve problems in circuits with an electromagnetic device from measure and calculated values • Determining the operating parameters of dc machines • Alternating an existing circuit with a dc machine to comply with specified operating parameters. • Developing circuits with electromagnetic devices to comply with a specified function and operating parameters. • Dealing with unplanned events	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEEEL0020 Solve problems in low voltage a.c. circuits Core					
28	• Using methodological techniques to solve problems in circuits in a.c. circuits from measure and calculated values • Determining the operating parameters of existing circuits • Altering an existing circuit to comply with specified operating parameters. • Developing circuits to comply with a specified function and operating parameters. • Determining the cause of low power factor in an existing circuit. • Determining conditions causing an existing circuit to be unsafe. • Dealing with unplanned events	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEEEL0012 Install low voltage wiring, appliances, switchgear and associated accessories Core					
14	**Task 14** **14 a)** **Practical** This task will allow you to demonstrate how you **install wiring and accessories for a low voltage final sub circuit (lighting, socket outlet or appliance) and verify circuit for connection to supply**. The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to: • Read and interpret drawings related to cable layouts, cable schedules and apparatus locations. • Routing, placing, and securing cables to comply with requirements. • Placing and securing accessories accurately. • Maintaining fire integrity. • Terminating cable and conductors to comply with requirements. • Deal with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions. Your assessor will discuss with you the appropriate equipment, resources, and location for demonstration. **All OHS, risk assessment and isolation procedures must be followed using safe work procedures and will be monitored when performing all tasks.** **14 b)** **Theory**	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
	This task will allow you to demonstrate your understanding of: • power cable and conductor terminations • technical standards, regulations, and codes for general electrical installations • electrical installations, wiring and accessories • electrical wiring systems • electrical installation, equipment requirements. You are required to provide a written or verbal response to the assessor detailing your understanding and knowledge of: **6) Power cable and conductor terminations:** • types of cable glands and their application • terminal types and applications • conductor and cable termination techniques. **7) Applying Standards, regulations, and codes for general electrical installations:** • protection for safety • installation design, selection, and installation of electrical equipment • testing and verification. **8) Electrical installations, wiring and accessories.** • standards, codes, and requirements applicable to installing wiring and accessories. • techniques for installing wiring and accessories.				

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEEEL0039 Design, install and verify compliance and functionality of general electrical installations Core					
16	**Task 16** **16 a)** **Practical** This unit involves the skills and knowledge required to design, install, inspect and test to verify an electrical installation is safe and complies with regulatory requirements. The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to do the tasks in • working safely; • designing, installing, • commissioning and fault finding of electrical installations; • visual inspections and mandatory testing; • following workplace procedures; and completing mandatory reporting requirements. • demonstrating currency for regulatory purposes may be required to undertake this unit to demonstrate their currency with verification of compliance requirements • possession of sufficient to evidence current knowledge of applicable standards and regulations.	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
	The skills and knowledge described in this unit require a licence or permit to practice in the workplace where work is carried out on electrical installations which are designed to operate at voltages greater than 50 volt (V) alternating current (a.c.) or 120 V direct current (d.c.). . Your assessor will discuss with you the appropriate resources and location for demonstration. **All OHS, risk assessment and isolation procedures must be followed using safe work procedures and will be monitored when performing all tasks.** **16 b)** **Theory** **<u>1.Prepare to design, install, inspect and test an electrical installation</u>** 1.1 WHS/OHS control measures for the site are identified and applied 1.2 WHS/OHS risk control measures and workplace procedures are followed in preparation for work 1.3 Safety hazards, which have not previously been identified, are noted and risk control measures are implemented 1.4 Installation documentation and/or relevant industry standard are reviewed and applied 1.5 Appropriate person/s is consulted to ensure work is coordinated with others involved on the worksite 1.6 Need to test or measure live electrical work is determined in accordance with WHS/OHS requirements and conducted in accordance with workplace safety procedures				

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
	1.7 Circuits, machines and/or plant are isolated in accordance with WHS/OHS job requirements and workplace procedures 1.8 Installation of wiring, appliances, switchgear, control gear and associated accessories is planned and appropriately sequenced in consultation with relevant person/s 1.9 Locations of appliances, switchgear, accessories and cable routes are planned within the constraints of building structure, other services, specifications and regulatory requirements 1.10 Tools, equipment and testing devices needed to verify compliance are obtained in accordance with workplace procedures and checked for correct operation and safety 1.11 Preparatory work is checked to ensure it complies with planned specifications and no damage has occurred **2.Select wiring systems, cables, control and protection for general electrical installations** 2.1 Wiring system is selected and suitable for the environments in which it will operate 2.2 Cable conductor sizes are selected to meet current-carrying capacity requirements and voltage-drop and earth fault-loop impedance limitations in accordance with relevant industry standards 2.3 Protective devices are selected to meet the required switching and tripping currents coordination and discrimination for overload and short circuit protection in accordance with relevant industry technical standards 2.4 Earthing system components are selected to meet multiple earthed neutral (MEN) system in accordance with relevant industry standards 2.5 Residual current devices (RCDs) are selected to meet the required circuit switching and tripping currents in accordance with relevant industry				

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
	technical standards 2.6 Switchgear/control gear is selected to meet current and voltage requirements and confirmed suitable for environmental conditions (ingress protection (IP) ratings) and functional requirements 2.7 Switchboards are arranged to accommodate control and protective devices, links, safety services and other distributor equipment in accordance with relevant industry technical standards **3 Install low voltage (LV) wiring and associated accessories** 3.1 Wiring and accessories are installed and terminated to comply with technical standards and job specifications and requirements 3.2 Cables and conductors are terminated at accessories in accordance with manufacturer specifications and regulatory requirements 3.3 Ongoing compliance and safety inspection of installed wiring systems and testing of installed circuits is undertaken 3.4 Defects revealed through ongoing compliance and safety inspection and tests are rectified **4.Install and connect LV Appliances, switchgear and accessories appliances, switchgear** 4.1 Appliances, switchgear and accessories are installed to comply with technical standards and job specifications and requirements with sufficient access to affect terminations, adjustment and maintenance				

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
	4.2 Wiring is terminated at appliances, switchgear and accessories in accordance with manufacturer specifications and functional and regulatory requirements 4.3 Ongoing compliance and safety inspections of the installed appliances, switchgear and accessories are undertaken 4.4 Defects revealed through ongoing compliance and safety inspection are rectified **5 Visually inspect and conduct safety testing on electrical installation** 5.1 Wiring is checked for suitability within the environments in which it is installed to ensure it is suitably protected from damage or overheating in accordance with relevant industry standards 5.2 Cable conductor sizes are compliant with current-carrying capacity, voltage-drop and fault-loop impedance limitations in accordance with relevant industry standards 5.3 Protection methods and devices are verified as meeting coordination requirements for overload and short-circuit protection in accordance with relevant industry standards 5.4 Switchgear and control gear rating is verified as being appropriate and meets functional requirements in accordance with relevant industry standards 5.5 Electrical equipment inspection and testing evidence is cited and verified in accordance with WHS/OHS safety regulations 5.6 Earthing system and components are located correctly, and conductor selection sizes are verified 5.7 Markings on switchboards are checked for accuracy and clarity and				

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
	comply with requirements 5.8 Mandatory tests are conducted in accordance with relevant industry standards 5.9 Testing is conducted to verify fault-loop impedance is sufficiently low and RCDs operate in accordance with relevant industry standards **6.Report inspection and test findings** 6.1 WHS/OHS risk control work completion measures and procedures are followed 6.2 Worksite is cleaned and made safe in accordance with workplace procedures 6.3 Non-compliance defects are identified and reported in accordance with workplace procedures 6.4 Recommendations for rectifying defects are made in accordance with workplace procedures 6.5 Mandatory documentation is completed in accordance with workplace procedures •				

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEEEL0023 Terminate cables, cords and accessories for low voltage circuits Core					
11	• Selecting appropriate cable/cord and conductor devices • Cutting cable ends and stripping sheath/insulation to a sufficient length • Fitting and securing cable glands/retaining devices correctly • Preparing and terminating conducts to suit the type of terminal at which there are to be connected. • Testing completed cables to ensure compliant continuity and insulation resistance • Dealing with unplanned events	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEEEL0018 Select wiring systems and select cables for low voltage electrical installations Core					
17	• Determining cable routes, the route lengths of cables and the conditions in which the wiring system is to operate. • Selecting wiring system suitable for the environment requirements. • Selecting cable conductor sizes in consideration to current-carrying capacity and voltage-drop / earth fault-loop limitation. • Ensuring co-ordination between circuit protective device and conductor current-carrying capacity. • Selecting compliant earthing system components • Documenting wiring systems and cables to be used, specification for items selected and reasons for the selections made. • Dealing with unplanned events	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEEEL0014 Isolate, test and troubleshoot low voltage electrical circuits Core					
18	• Envisaging the likely extent of the fault and the work from fault/breakdown reports and/or discussion to elicit information on the fault/breakdown with appropriate person(s). • Using appropriate tools and resources, and methodical fault-finding techniques. • Locating and trouble-shooting faults efficiently. • Conducting tests or measurements in strict accordance with OHS and electrical safe working requirements. • Rectifying faults effectively. • Reporting cause of the fault and justifying the repairs undertaken.	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEEEL0005 Develop and connect electrical control circuits Core					
10	• Identification of given circuit diagrams (schematic) symbols and explain the operation of the components represented • labelling wires and terminal (numbering systems) • control relay - operating principles, basic contact configurations and identification and common applications • push button - switching configurations and common applications • selecting pushbuttons/pilot lamps from manufacturer's catalogues for specific applications • development of simple stop-start relay circuit that incorporates pilot lights and latching circuit. • connection and testing of control circuits	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			
	• selecting relays from manufacturers' catalogue for specified applications • circuit development of electrical control circuit in accordance with a written description (specification) and list the sequence of operation of the circuit • connecting simple electrical control circuit from circuit diagrams • applying safe working practices when testing an electrical control circuit				
	• Determining control scenarios specifications. • Developing schematic arrangement of control circuits that meets the required scenario as specified. • Connecting control circuit to function as specified.				

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
	• Conducting safety and functional testing correctly • Identifying and correcting non-compliant control functions. • Documenting 'as-connected' control circuit.				

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEERE0001 Apply environmentally and sustainable procedures in the energy sector Core					
25	• Sustainable work practices • Techniques for reducing carbon produced energy and hence greenhouse gases	Competent performance with inherent safe working practices is expected in the Industry to which this 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 skills described in this unit.			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEECS0033 Use engineering applications software on personal computers Group A Elective					
22	• Starting up • Selecting application • Entering information • Saving • Printing	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UETDRRF004 Perform rescue from a live LV panel*Group A Elective					
29	The practical demonstration of Rescuing a person from a live LV panel in the context of transmission, distribution or rail work functions. The responsibilities for health, safety and risk management processes at all operative levels and adherence to safety practices as part of the normal way of doing work.	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEEIC0013 Develop, enter and verify discrete control programs for programmable controllersGroup B Elective					
30	• Basic Programming • Program modification • Ladder diagram development • Connecting the programmable controller.	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			
	• Installation precaution • Safety systems • AS/NZS requirements				
	• PLC Fault Finding • Controller Status • I/O Faults • Program Faults				

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEEAS0007 Assemble, mount and connect control gear and switchgear Group A Elective					
21	• wiring and schematic diagrams • placement /layout of power circuit devices and components • placement/layout of control circuit devices and components	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			
	• earthing • size of power and control circuit conductors • equipment layout methods and accessories				
	• Correctly selecting and placing, switchgear and control gear.				
	• Making connection without damaging switchgear/control.				

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UEEEL0047 Identify, shut down and restart systems with alternate supplies Core					
32	**Practical** This unit involves the skills and knowledge required to identify, shut down and restart systems with alternate supplies. The demonstration will occur in the workplace or in a simulated environment and will include evidence of your ability to • identify the system configuration, • work safely with electricity generation systems and inverters, • identify hazards and controlling the associated risks, • isolate and test for de-energisation, • reinstate the system after isolation complete relevant documentation	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
UETDRRF004 Perform rescue from a live LV panel Core					
29	The practical demonstration of Rescuing a person from a live LV panel in the context of transmission, distribution or rail work functions. The responsibilities for health, safety and risk management processes at all operative levels and adherence to safety practices as part of the normal way of doing work.	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
HLTAID009 Provide cardiopulmonary resuscitation Core					
31	**Task 31** **Practical** Practical demonstration of 1.Respond to an emergency situation 1.1. Recognise and assess an emergency situation. 1.2. Ensure safety for self, bystanders and casualty. 1.3. Assess the casualty and recognise the need for cardiopulmonary resuscitation (CPR). 1.4. Seek assistance from emergency services 2. Perform CPR procedures. 2.1. Perform CPR in accordance with the ARC guidelines. 2.2. Display respectful behaviour towards casualty. 2.3. Operate an automated external defibrillator (AED) according to manufacturers' instructions. 3. Communicate details of the incident. 3.1. Accurately convey incident details to emergency services. 3.2. Report details of incident in line with appropriate workplace or site procedures. 3.3. Maintain privacy and confidentiality of information in line with	Workplace Health and Safety Act: 1995 Electrical Safety Act & Regulations Electrical Code of Practice AS/NZS3000:2007 Environmental protection Manufacturer's instructions for materials and equipment Correct use of MSDS data Workplace documentation (SOP, Work permits, Safety checklists, incident reports) Elevated Work Platforms Permit			

Task No.	Observable behaviours in task	Industry requirements	Assessor's comments	Indicate if behaviour observed	Date assessed
	statutory or organisational policies 4.Review the incident. 4.1. Recognise the possible psychological impacts on self and other rescuers and seek help when required. 4.2. Contribute to a review of the first aid response as required.				

SECTION F

Resources for Practical Tasks

Please refer to Section D – Practical Tasks:

The resource requirements for individual practical tasks and scenarios can be determined by the assessor.

The resources required to adequately conduct assessment will be dependent on the workplace or simulated environment chosen for each task/scenario. This will also apply to written tasks.

SECTION G

Third Party Verification

The preferred approach in gaining third party validation is to take the forms in this section to the candidate's previous employers or referees to gain confirmation of the candidate's skills against the required competencies. This would be done during a conversation or interview with these people.

It may be beneficial to contact the employers/referees early in the recognition process to make appointments, particularly if you have to travel some distance to visit them. This may be done on the same day as a practical assessment in the workplace if appropriate.

It is recommended that verification be obtained from one or two referees who can confirm the candidate's industry skills in context over time.

After completing verification conversation for student's referee's Assessor to make notes to confirm the verification conversation occurred.

Details required, date _____/ Time of call: _____
Person contacted: _____

Verification of skills/knowledge as advised by the referee for student units of competency (verified by Assessor)

Assessor Signature: _____ Date: _____

REFEREE TESTIMONIAL

(Date)
To whom it may concern,

RE: _____ skills in/as _____
(insert candidate name) *(insert industry/job title)*

I certify that the above-named person has:

worked at _____ for a period of _____ years

regularly undertaken the following activities within the workplace since commencing employment with this organisation:

➔ *Initial those skills/ competencies (below) that the candidate has or can successfully perform in the workplace*

_____ Acts in accordance with Workplace Health & Safety regulations
_____ Works effectively with other team members and supervisors
_____ Able to Fabricate, dismantle, assemble of utilities industry components
_____ Solves problems in single and three phase low voltage electrical apparatus and circuits
_____ Solves problems in D.C. circuits
_____ Fix and secure electrotechnology equipment
_____ Uses drawings, diagrams, schedules and manuals
_____ Lays wiring and terminates accessories
_____ Documents occupational hazards and risks in electrical
_____ Solves problems in electromagnetic circuits
_____ Solves problems in low voltage A.C. circuits
_____ Installs wiring and accessories
_____ Installs low voltage electrical apparatus and associated equipment
_____ Verifies compliance and functionality of general electrical installations
_____ Selects and arranges equipment for general electrical installations
_____ Trouble shoot and repair faults in low voltage electrical apparatus and circuits
_____ Develops and connects control circuits
_____ Apply environmental and sustainable procedures in the energy sector
_____ Install appliances, switchgear, and associated accessories for low voltage electrical installations
_____ Use basic computer application relevant to an energy sector workplace
_____ Assemble, mount, and connect switchgear and control gear
_____ Develop, enter, and verify discrete control programs for programmable controllers
_____ Source and purchase materials for installation/service jobs.

If you would like any further information or would like to discuss any of the above, I can be contacted on _____

Yours sincerely
Signature
License number:
Phone number:

SECTION H

Assessment Tables

You use these tables as a reference tool to see at a glance which units/elements of competency are within the qualification.

Question numbers refer to those found in **SECTION C** of this kit.

Practical assessment/scenarios numbers refer to those found in **SECTION D** of this kit.

It is important to note that this section is used for validation purposes only. Any mapping should be done after questions and tasks have been selected.

ASSESSMENT TABLE

UEECD0007 Apply work health and safety regulations, codes and practices in the workplace

ELEMENTS		PERFORMANCE CRITERIA		QUESTION	PRACTICAL TASK
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Prepare to enter an electrotechnology workplace**	**1.1**	Work area access permits are obtained from appropriate person/s in accordance with workplace procedures	1	1
		1.2	Relevant workplace WHS/OHS safety regulations and codes of practices are identified and followed when entering the electrotechnology work area	1	1
		1.3	Safe work methods for controlling risks are obtained, read and applied prior to undertaking work activity in accordance with WHS/OHS workplace procedures	1	1
		1.4	Preparation for electrical and non-electrical isolation is carried out to prevent creation of hazards from loss of machine/system/process control in accordance with WHS/OHS workplace procedures	1	1
		1.5	Tools, equipment and chemicals required for the electrotechnology work are checked for safety and correct functionality in accordance with workplace procedures and regulatory requirements	1	1
		1.6	Personal protective equipment (PPE) is worn appropriate to the electrotechnology work area and in accordance with workplace procedures	1	1
2	**Apply safe electrotechnology working practices**	**2.1**	Risk control work measures are implemented in accordance with WHS/OHS workplace procedures	1,2	1
		2.2	Procedures for dealing with accidents, fires and emergencies are followed in accordance with workplace procedures, scope of responsibility and capabilities	3	2
		2.3	Safe work methods are applied when working at heights including safe and effective use of safety equipment	3	2

		2.4	Safe work methods are used when undertaking lifting, lowering, pushing, pulling, carrying or otherwise moving, holding or restraining workplace tasks in accordance with relevant code of practice	3	2
		2.5	Safe work methods for removing an electric shock victim from a live electrical situation are demonstrated in accordance with workplace emergency management procedures	3	2
		2.6	Working area is kept clean, neat and tidy in accordance with workplace housekeeping procedures	3	2
3	**Follow electrotechnology workplace procedures for hazard identification and risk control**	**3.1**	Hazards are identified, control measures implemented and reviewed through regular active participation in the consultation process with employer and other employees	2	1
		3.2	Hazards in the work area are identified and reported to relevant person/s in accordance with workplace procedures	2	1
		3.3	WHS/OHS documentation and incident records are completed in accordance with regulatory requirements and workplace procedures	3	2
		3.4	Workplace instructions are followed in accordance with regulatory requirements and workplace procedures	3	1

ELEMENTS		PERFORMANCE CRITERIA		QUESTION	PRACTICAL TASK
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Identify and document hazards and risks associated with electrotechnology work**	**1.1**	Hazards are identified and documented by undertaking a job analysis and worksite inspection in consultation with relevant person/s and in accordance with workplace procedures	4	3
		1.2	Risks associated with identified hazards are assessed in consultation with relevant person/s, taking into account existing control measures and documented in accordance with workplace procedures	4	3
2	**Assign levels of risk and develop and document control measures**	**2.1**	Level of risk is assessed and prioritised for each identified hazard in consultation with relevant/s persons and in accordance with regulations and WHS/OHS workplace compliance procedures	4	3
		2.2	Control measures for identified hazards are determined by applying the hierarchy of control and activities to eliminate and/or mitigate the risk	4	3
		2.3	Level of risk is re-assessed to confirm the required control measures reduce the risk level to as low as reasonably practicable	4	3
		2.4	Hazards risk level and control measures are agreed to in consultation with relevant stakeholders and documented in accordance with workplace procedures	4	3
3	**Monitor, review and document risk control measures**	**3.1**	Documented control measures are recorded in workplace risk register and made available for reference by relevant person/s	4	3
		3.2	Control measures are reviewed and modified, as required, in consultation with relevant person/s in accordance with workplace procedures	4	3
		3.3	Document and apply measures to control WHS/OHS risks associated with electrotechnology work	4	3
		3.4	Changes and updates are made to relevant documentation, risk register as additional hazards are identified	4	3

UEECD0019 Fabricate, assemble and dismantle utilities industry components

ELEMENTS	PERFORMANCE CRITERIA	QUESTION	PRACTICAL TASK
Elements describe	Performance criteria describe the performance needed to demonstrate achievement of the		

the essential outcomes.		element.			
1	**Prepare for dismantling, assembling and fabrication work**	**1.1**	Work health and safety (WHS)/occupational health and safety (OHS) procedures for a given work area are identified and applied in accordance with workplace procedures	1	1
		1.2	WHS/OHS risk control measures and workplace procedures are followed in preparation for the work	1.4	1
		1.3	Work instructions and relevant workplace procedures, industry standards, codes of practice and regulations for dismantling, assembling and fabrication are identified and applied	4	1
		1.4	Scope of work to be undertaken is obtained from relevant documentation and from work supervisor	5	Core
		1.5	Advice is sought from work supervisor to ensure work is coordinated effectively with other persons	5	Core
		1.6	Materials required for work are identified and obtained in accordance with workplace procedures	5	Core
		1.7	Tools, equipment and measuring devices needed to carry out the work are obtained and checked for correct operation and safety	10	5
2	**Dismantle and assemble utilities industry apparatus**	**2.1**	WHS/OHS risk control measures and workplace procedures for dismantling and assembling apparatus are followed	1,2,4	1
		2.2	Circuits/apparatus/plant are checked and isolation confirmed in accordance with WHS/OHS workplace requirements and procedures	1,2	1
		2.3	Relevant tools are selected and used correctly and safely in accordance with manufacturer instructions and workplace procedures	5	4
		2.4	Relevant manufacturer guides and instructions are followed when dismantling and assembling apparatus	9	5
		2.5	Apparatus components are marked or tagged correctly during dismantling to ensure correct and efficient reassembly in accordance with workplace procedures	9	5
		2.6	Dismantled components and parts are stored to protect them against loss or damage in accordance with manufacturer instructions and workplace procedures	9	5
		2.7	Apparatus is dismantled and assembled without waste of materials and energy, damage to apparatus, the surrounding environment or services	8	core
		2.8	Unplanned events are referred to supervisor for directions in accordance with workplace procedures	4	core
		2.10	Worksite is tidied, tools and equipment cleaned and securely stored in accordance with workplace procedures	6	core
		2.11	Work supervisor is notified of dismantling and assembling apparatus completion in	9	4

			accordance with workplace procedures		
3	**Fabricate utilities industry components**	**3.1**	WHS/OHS risk control measures and workplace procedures for fabricating components are followed	1,2,4	core
		3.2	Circuits/apparatus/plant are checked and isolated in accordance WHS/OHS workplace requirements and procedures	1,2	core
		3.3	Relevant tools and equipment are selected, used correctly and safely in accordance with manufacturer instructions and workplace procedures	5	core
		3.4	Drawings, diagrams and instructions for fabrication of mechanical components are followed in accordance with workplace procedures	5.10	core
		3.5	Component dimensions are determined directly by measuring, or by calculation from information supplied in job drawings and instructions	10	core
		3.6	Mechanical components are fabricated by measuring, marking out, cutting, joining and fixing accurately using relevant equipment and tools, minimising waste of materials and energy and/or damage to the surrounding environment or services	5	5
		3.7	Unplanned events are referred to supervisor for directions in accordance with workplace procedures	8	core
		3.8	Quality checks are carried out in accordance with workplace procedures	8	core
		3.9	Worksite is tidied, tools and equipment cleaned and securely stored in accordance with workplace procedures	6	core
		3.10	Work supervisor is notified of fabrication completion in accordance with workplace procedures	10	5

UEECD0020 Fix and secure electrotechnology equipment

ELEMENTS		**PERFORMANCE CRITERIA**		**QUESTION**	**PRACTICAL TASK**
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	Prepare to Fix and secure	1.1	OHS procedures for a given work area are identified, obtained and understood. Prepare to Fix and secure electrotechnology equipment.	1 1,4	1 1
		1.2	OHS risk control work preparation measures and procedures are followed.	5	

	electrotechnology equipment.	1.3 1.4 1.5 1.6 1.7 1.8	The scope of work to be undertaken is obtained from documentation or from work supervisor. Advice is sought from the work supervisor to ensure the work is coordinated effectively with others. Sources of materials that may be required for the work are identified and accessed in accordance with established procedures. Fixing devices are selected for their suitable ability for the environment, the load they are to support and substrata into which they Supporting accessories/equipment is selected for suitability for the environment and ability to support and protect from damage that which they are intended to support. Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.	5 5 12 12 5	Core Core Core 7 7 Core
2	Install fixing and support devices.	2.1 2.2 2.3 2.4 2.5	Electrical isolation is arranged where work is within arms-reach of exposed conductive parts, plant or machinery in strict accordance OHS requirements and procedures. Install fixing and support devices. Other OHS risk control measures relevant to the work site are followed. Fixing devices are installed in accordance with manufacturer instructions. Support accessories/equipment is install accurately and to comply with technical standards and job specifications. Work is carried out efficiently without waste of materials or damage to apparatus, circuits, the surrounding environment or services and using sustainable energy principles.	1, 1 12 12 8 1	1 1 7 7 Core core
3	Complete fixing and support work.	3.1 3.2 3.3	OHS risk control work completion measures and procedures are followed. Work site is tidied and tools and equipment cleaned and securely stored. Complete fixing and support work. Appropriate personnel are notified of the work completion.	1,2,4,7 8 7	1, Core Core Core

UEECD0051 Use drawings, diagrams, schedules, standards, codes and specifications*					
ELEMENTS		**PERFORMANCE CRITERIA**		**QUESTION**	**PRACTICAL TASK**
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	Prepare to Use drawings, diagrams, schedules, standards, codes and	1.1 1.2	Established OHS risk control measures and procedures are followed. Prepare to use drawings, diagrams, schedules and manuals. The need for drawings, diagrams, schedules or manuals is determined from the nature of the work to be	1 5	1 Core

	specifications.	1.3	undertaken. Established routines and procedures are followed to obtain drawings, diagrams, schedules or manuals required for the work to be undertaken.	5	Core
2	Use drawings, diagrams, schedules, standards, codes and specifications to obtain job information.	2.1 2.2 2.3 2.4 2.5 2.6	Drawings, diagrams, schedules and/or manuals are selected, appropriate to the work being undertaken. Use drawings, diagrams, schedules and manuals to obtain job information. Drawings, diagrams and schedules are interpreted using knowledge of drawing layouts, conventions and symbols. Dimensions are extracted from drawings and diagrams for application to work undertaken. Location of equipment is determined from equipment schedules and location diagrams. Manuals are reviewed to ascertain their format and where information relevant to the work to be undertaken is located. Information given in manuals is interpreted in relation to the work to be undertaken.	13 13 13 13 13 13	8 8 8 8 8 8
3	Use drawings, diagrams, schedules, standards, codes and specifications to convey information and ideas.	3.1 3.2 3.3	Drawing conventions are used in neat freehand drawings to convey information and ideas to others involved in the work to be undertaken. Drawing conventions are used to neatly correct freehand original job drawing to show final 'as installed' arrangement. Use drawings, diagrams, schedules, standards, codes and specifications to convey information and ideas. Corrected drawings are forwarded to appropriate person(s) in accordance with established procedures.	13 13 5	9 9 Core

	UEECD0044 Solve problems in multiple path circuits		
ELEMENTS	**PERFORMANCE CRITERIA**	**QUESTION**	**PRACTICAL TASK**

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Prepare to work on multiple path circuits**	**1.1**	Scope of work to be undertaken is determined from relevant documentation, electrical drawings or relevant person/s	1,14	1,3,10
		1.2	Work health and safety (WHS)/occupational health and safety (OHS) workplace procedures for a given work area are identified and applied	1,4,14	1,3,10
		1.3	Electrical hazards are identified, risks are assessed, and control measures are implemented	5,14	Core, 10
		1.4	Advice is sought from the relevant person/s to ensure the work is coordinated effectively with others	5,14	Core, 10
		1.5	Materials required for work are identified and accessed in accordance with workplace procedures	5,14	Core, 10
		1.6	Tools, equipment and testing devices needed to carry out work are obtained and checked for correct operation and safety	5,14	Core, 10
2	**Solve multiple path circuit problems**	**2.1**	The need to test or measure live is determined in accordance with WHS/OHS requirements and when necessary conducted in accordance with workplace procedures	1,14	1,10
		2.2	Circuits are checked as isolated in accordance with workplace procedures and regulatory	1,14	1,10

			requirements		
		2.3	Expected circuit parameters are calculated from relevant component ratings/specifications	1,14	10
		2.4	Circuit parameters are measured in accordance with industry standards and checked against expected values	14	10
		2.5	Circuit problems are assessed using measured and calculated values as they apply to multiple path circuits	14	10
		2.6	Circuit solutions are determined from measured and calculated values of resistance, voltage, current and power in extra-low voltage (ELV) multiple path circuits	14	10
		2.7	Solutions are tested in accordance with workplace procedures and industry standards	14	10
		2.8	Problems are resolved without damage to equipment, circuits, the surrounding environment or services using sustainable energy practices	14	10
		2.9	Unplanned situations are responded to in accordance with workplace procedures, in a manner that minimises risk to personnel and equipment	14	10
3	**Complete work and document problem-solving activities**	**3.1**	WHS/OHS work completion risk control measures and procedures are followed	1,2,4,7,14	1,10
		3.2	Worksite is cleaned and made safe in accordance with workplace procedures	8,14	Core, 10

		3.3	Justification for solutions used to resolve circuit problems is documented	7.14	Core, 10
		3.4	Work completion is documented, electrical drawings are updated, and relevant personnel are notified in accordance with workplace procedures	8,14	Core, 10

		# UEECD0046 Solve problems in single path circuits			
ELEMENTS		**PERFORMANCE CRITERIA**		**QUESTION**	**PRACTICAL TASK**
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Prepare to work on multiple path circuits**	**1.1**	Scope of work to be undertaken is determined from relevant documentation, electrical drawings or relevant person/s	1,14	1,3,10
		1.2	Work health and safety (WHS)/occupational health and safety (OHS) workplace procedures for a	1,4,14	1,3,10

			given work area are identified and applied		
		1.3	Electrical hazards are identified, risks are assessed, and control measures are implemented	5,14	Core, 10
		1.4	Advice is sought from the relevant person/s to ensure the work is coordinated effectively with others	5,14	Core, 10
		1.5	Materials required for work are identified and accessed in accordance with workplace procedures	5,14	Core, 10
		1.6	Tools, equipment and testing devices needed to carry out work are obtained and checked for correct operation and safety	5,14	Core, 10
2	**Solve multiple path circuit problems**	**2.1**	The need to test or measure live is determined in accordance with WHS/OHS requirements and when necessary conducted in accordance with workplace procedures	1,14	1,10
		2.2	Circuits are checked as isolated in accordance with workplace procedures and regulatory requirements	1,14	1,10
		2.3	Expected circuit parameters are calculated from relevant component ratings/specifications	1,14	10
		2.4	Circuit parameters are measured in accordance with industry standards and checked against expected values	14	10
		2.5	Circuit problems are assessed using measured and calculated values as they	14	10

			apply to single path, single source circuits		
		2.6	Circuit solutions are determined from measured and calculated values of resistance, voltage, current, and power in single path circuits	14	10
		2.7	Solutions are tested in accordance with workplace procedures and industry standards	14	10
		2.8	Problems are resolved without damage to equipment, circuits, the surrounding environment or services using sustainable energy practices	14	10
		2.9	Unplanned situations are responded to in accordance with workplace procedures, in a manner that minimises risk to personnel and equipment	14	10
3	**Complete work and document problem-solving activities**	**3.1**	WHS/OHS work completion risk control measures and procedures are followed	1,2,4,7,14	1,10
		3.2	Worksite is cleaned and made safe in accordance with workplace procedures	8,14	Core, 10
		3.3	Justification for solutions used to resolve circuit problems is documented	7.14	Core, 10
		3.4	Work completion is documented, electrical drawings are updated, and relevant personnel are notified in accordance with workplace procedures	8,14	Core, 10

	UEEEL0023 Terminate cables, cords and accessories for low voltage circuits			
	ELEMENTS	**PERFORMANCE CRITERIA**	**QUESTION**	**PRACTICAL TASK**
	Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.		
1	Prepare to terminate cables, cords and conductors.	1.1 OHS procedures for a given work area are identified, obtained and understood. 1.2 Health and safety risks are identified and established risk control measures and procedures in preparation for the work are followed 1.3 Safety hazards that have not previously been identified are noted and established risk control measures are Implemented. 1.4 The junction box/ terminal enclosures and terminal types are inspected to select the type and size of cable and Conductor termination devices needed .1.5 Tools, materials and testing devices needed to for terminating cables and cords are obtained in accordance with Established procedures and checked for correct operation and safety.	32	11
2	Terminate cables, cords and conductors.	2.1 OHS risk control measures and procedures for carrying out the work are 2.2 Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.	32	11

		2.3	Cable /cord ends are cut and sheath/ insulation stripped with sufficient length to prevent strain on terminations and Without undue waste .		
		2.4	Cable glands/ retaining devices are fitted and secured to ensure cable/cord cannot be pulled out of entry into junction Box/ terminal enclosure.		
		2.5	Conductors are terminated to suit the type of terminal they are connected to.		
		2.6	Conductors are terminated to ensure continuity across the terminal.		
		2.7	Established methods for dealing with unexpected situations are discussed with appropriate person or persons and documented.		
		2.8	Unexpected situations are dealt with safely and with the approval of an authorised person. .		
3	Test terminated cables and cords	3.1	OHS work completion risk control measures and procedures are followed.	32	11
		3.2	Terminated cables are tested to ensure continuity and insulation resistance comply with requirements. .		

UEEEL0021 Solve problems in magnetic and electromagnetic devices

ELEMENTS		PERFORMANCE CRITERIA		QUESTION	PRACTICAL TASK
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Prepare to work with electromagnetic devices and circuits**	**1.1**	WHS/OHS requirements and workplace procedures for a given work area are identified and applied	1,16	1.12
		1.2	Device/s and/or circuit/s problems are identified from documentation or work supervisor to determine scope of work	1	1.12
		1.3	Hazards are identified, risks are assessed and control measures are implemented	16	12
		1.4	Tools, equipment and testing devices to carry out work are obtained and checked for correct operation and safety	5	core

		1.5	Circuits are checked and isolated in accordance with workplace procedures and regulatory requirements	5	core
		1.6	Advice is sought from the work supervisor to ensure work is coordinated effectively with others	5	core
2	**Solve electromagnetic device and/or circuit problems**	2.1	WHS/OHS risk control measures and workplace procedures for carrying out work are followed	1	1
		2.2	Need to test or measure live work is determined in accordance with WHS/OHS job safety assessment requirements and work is conducted using safety control measures workplace procedures	1	1
		2.3	Relevant circuits and devices are checked as being isolated, as required, in accordance with WHS/OHS requirements and workplace procedures	1	1
		2.4	Operating parameters of an existing circuit with an electromagnetic device are determined	16	12
		2.5	Methodical techniques are used to resolve circuit problems from measured and calculated values as they apply to electromagnetic devices/circuits	6	core
		2.6	Existing circuit with an electromagnetic device is altered to comply with specified operating parameters	6	core

		2.7	Circuit with electromagnetic device is developed to comply with a specified function and operating parameters	6	core
		2.8	Electrical equipment is connected and tested to determine correct operation	6	core
		2.9	Unplanned situations are responded to in accordance with workplace procedures in a manner that minimises risk to personnel and equipment	6	core
		2.10	Problems are resolved without damage to apparatus, circuits, the surrounding environment or services using sustainable energy practices	6	core
3	**Complete work and documentation**	3.1	WHS/OHS work completion risk control measures and workplace procedures are followed	1	1
		3.2	Worksite is cleaned and made safe in accordance with workplace procedures	8	core
		3.3	Justification for solutions used to resolve problems is documented in accordance with established workplace procedures	7	core
		3.4	Work completion is documented and appropriate person/s notified in accordance with workplace procedures	7	core

UEEEL0019 Solve problems in direct current (d.c.) machines

ELEMENTS		PERFORMANCE CRITERIA		QUESTION	PRACTICAL TASK
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Prepare to work with dc machine**	**1.1**	WHS/OHS requirements and workplace procedures for a given work area are identified and applied	1,16	1.12
		1.2	Device/s and/or circuit/s problems are identified from documentation or work supervisor to determine scope of work	1	1.12
		1.3	Hazards are identified, risks are assessed and control measures are implemented	16	12
		1.4	Tools, equipment and testing devices to carry out work are obtained and checked for correct operation and safety	5	core
		1.5	Circuits are checked and isolated in accordance with workplace procedures and regulatory requirements	5	core
		1.6	Advice is sought from the work supervisor to ensure work is coordinated effectively with others	5	core

2	**Solve electromagnetic device and/or circuit problems**	2.1	WHS/OHS risk control measures and workplace procedures for carrying out work are followed	1	1
		2.2	Need to test or measure live work is determined in accordance with WHS/OHS job safety assessment requirements and work is conducted using safety control measures workplace procedures	1	1
		2.3	Relevant circuits and devices are checked as being isolated, as required, in accordance with WHS/OHS requirements and workplace procedures	1	1
		2.4	Operating parameters of a machine are determined from nameplate details	16	12
		2.5	Electrical measurements are completed and readings compared with nameplate ratings	6	core
		2.6	Methodical techniques are used to identify and resolve problems from measured and calculated values as they apply to machines	6	core
		2.7	Machine is connected and tested to determine correct operation	6	core
		2.8	Unplanned situations are responded to in accordance with workplace procedures in a manner that minimises risk to personnel and equipment	6	core
		2.9	Problems are resolved without damage to apparatus, circuits, the surrounding environment or services and using sustainable energy practices	6	core

3	**Complete work and documentation**	3.1	WHS/OHS work completion risk control measures and workplace procedures are followed	1	1
		3.2	Worksite is cleaned and made safe in accordance with workplace procedures	8	core
		3.3	Justification for solutions used to resolve problems is documented in accordance with established workplace procedures	7	core
		3.4	Work completion is documented and appropriate person/s notified in accordance with workplace procedures	7	core

UEEEL0008 Evaluate and modify low voltage heating equipment and controls

ELEMENTS	PERFORMANCE CRITERIA	QUESTION	PRACTICAL TASK

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Prepare to work on heating equipment**	**1.1**	Scope of work is obtained from relevant documentation, electrical drawings or relevant person/s	1	1,13
		1.2	WHS/OHS requirements and workplace procedures for a given work area are identified and applied	1	1,13
		1.3	Hazards are identified, risks are assessed and control measures are implemented	1	Core
		1.4	Advice is sought from work supervisor to ensure the work is coordinated effectively with others	5	Core
		1.5	Sources of materials required for work are determined in accordance with workplace procedures	5	Core
		1.6	Tools, equipment and testing devices required to carry out work are obtained and checked for correct operation and safety	5	Core
2	**Evaluate and modify heating equipment**	**2.1**	Equipment and circuits are checked and arrangement identified	1,17	1,13
		2.2	Circuits are checked and isolated in accordance with workplace procedures and regulatory requirements	1	1

		2.3	The need to test or measure live work is determined in accordance with WHS/OHS requirements and, as necessary, conducted in accordance with workplace procedures	17	13
		2.4	Fault/s and probable cause/s are identified from measured and calculated values as they apply to heating equipment	17	13
		2.5	Required components are identified and replaced in accordance with manufacturer specifications and industry standards	17	13
		2.6	Unexpected situations are dealt with safely and with the approval of relevant person/s	6	core
3	**Complete work and document activities**	**3.1**	WHS/OHS work completion risk control measures and workplace procedures are followed	1	1
		3.2	Worksite is cleaned and made safe in accordance with workplace procedures	8	Core
		3.3	Justification for solutions used to modify circuits and equipment is documented	7	Core
		3.4	Work completion is documented and an appropriate person/s notified in accordance with workplace procedures	8	core

UEEEL0010 Evaluate and modify low voltage socket outlets circuits					
ELEMENTS		**PERFORMANCE CRITERIA**		**QUESTION**	**PRACTICAL TASK**
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Prepare to work on**	**1.1**	Scope of work is obtained from relevant documentation, electrical drawings or	1	1,13

	socket outlet circuits		relevant person/s		
		1.2	WHS/OHS requirements and workplace procedures for a given work area are identified and applied	1	1,13
		1.3	Hazards are identified, risks are assessed and control measures are implemented	1	Core
		1.4	Advice is sought from work supervisor to ensure the work is coordinated effectively with others	5	Core
		1.5	Sources of materials required for work are determined in accordance with workplace procedures	5	Core
		1.6	Tools, equipment and testing devices required to carry out work are obtained and checked for correct operation and safety	5	Core
2	**Evaluate and modify socket outlet circuits**	**2.1**	Socket outlets and circuits are checked and arrangement identified	1,17	1,13
		2.2	Circuits are checked and isolated in accordance with workplace procedures and regulatory requirements	1	1
		2.3	The need to test or measure live work is determined in accordance with WHS/OHS requirements and, as necessary, conducted in accordance with workplace procedures	17	13

		2.4	Fault/s and probable cause/s are identified from measure and calculated values as they apply to socket outlet circuits	17	13
		2.5	Components are identified and replaced in accordance with manufacturer specifications and industry standards	17	13
		2.6	Unexpected situations are dealt with safely and with the approval of relevant person/s	6	core
3	**Complete work and document activities**	**3.1**	WHS/OHS work completion risk control measures and workplace procedures are followed	1	1
		3.2	Worksite is cleaned and made safe in accordance with workplace procedures	8	Core
		3.3	Justification for solutions used to modify circuits and equipment is documented	7	Core
		3.4	Work completion is documented and an appropriate person/s notified in accordance with workplace procedures	8	core

UEEEL0009 Evaluate and modify low voltage lighting circuits, equipment and control

ELEMENTS		PERFORMANCE CRITERIA		QUESTION	PRACTICAL TASK
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Prepare to work on lighting circuits**	**1.1**	Scope of work is obtained from relevant documentation, electrical drawings or relevant person/s	1	1,13
		1.2	WHS/OHS requirements and workplace procedures for a given work area are identified and applied	1	1,13

		1.3	Hazards are identified, risks are assessed and control measures are implemented	1	Core
		1.4	Advice is sought from work supervisor to ensure the work is coordinated effectively with others	5	Core
		1.5	Sources of materials required for work are determined in accordance with workplace procedures	5	Core
		1.6	Tools, equipment and testing devices required to carry out work are obtained and checked for correct operation and safety	5	Core
2	**Evaluate and modify lighting circuits**	**2.1**	Equipment and circuits are checked and arrangement identified	1,17	1,13
		2.2	Circuits are checked and isolated in accordance with workplace procedures and regulatory requirements	1	1
		2.3	The need to test or measure live work is determined in accordance with WHS/OHS requirements and when necessary conducted in accordance with workplace procedures	17	13
		2.4	Fault/s and probable cause/s are identified from measured and calculated values as they apply to lighting equipment	17	13
		2.5	Required components are identified and replaced in accordance with manufacturer specifications and industry standards	17	13

		2.6	Unexpected situations are dealt with safely and with the approval of relevant person/s	6	core
3	**Complete work and document activities**	**3.1**	WHS/OHS work completion risk control measures and workplace procedures are followed	1	1
		3.2	Worksite is cleaned and made safe in accordance with workplace procedures	8	Core
		3.3	Justification for solutions used to modify circuits and equipment is documented	7	Core
		3.4	Work completion is documented and an appropriate person/s notified in accordance with workplace procedures	8	core

UEEEL0012 Install low voltage wiring, appliances, switchgear and associated accessories

ELEMENTS		PERFORMANCE CRITERIA		QUESTION	PRACTICAL TASK
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Prepare to install low voltage (LV) wiring, appliances, switchgear and associated accessories**	**1.1**	Nature and location of work is determined from workplace documentation, drawings or relevant person/s to determine the scope of work	1	1
		1.2	WHS/OHS requirements and workplace procedures are applied	1	1
		1.3	Risks are identified and control measures implemented in accordance with workplace procedures	1	1
		1.4	Need to test or measure live work is determined in accordance with WHS/OHS requirements and conducted in accordance with workplace safety procedures	1	1
		1.5	Circuits/machines/plant are checked as being isolated, where necessary, in strict	4	core

			accordance with WHS/OHS requirements and procedures.		
		1.6	Installation of wiring, appliances, switchgear, control gear and associated accessories is planned and appropriately sequenced in consultation with relevant person/s	5	core
		1.7	Locations of appliances, switchgear, accessories and cable routes are planned within the constraints of building structure, other services, specifications and regulatory requirements	5	core
		1.8	Material required for installation work is obtained in accordance with workplace procedures and checked against job specifications	5	core
		1.9	Tools, equipment and measuring devices required for the installation and work environment are obtained in accordance with workplace procedures and checked for correct operation and safety	5	core
		1.10	Preparatory work is inspected and checked to ensure no damage has occurred and compliance with job specifications	5	core
2	**Install LV wiring and associated accessories**	**2.1**	Wiring and accessories are installed and terminated to comply with technical standards and job specifications and requirements	18	14
		2.2	Accessories are installed straight and square in the required locations and within acceptable tolerances	18	14

		2.3	Cables and conductors are terminated at accessories in accordance with manufacturer specifications and regulatory requirements	18	14
		2.4	Ongoing compliance and safety inspection of installed wiring systems and testing of installed circuits is undertaken	1	1
		2.5	Defects revealed through on-going compliance and safety inspection and tests are rectified	5	core
		2.6	Cable installation and termination is carried out efficiently without unnecessary waste of materials or damage to apparatus, circuits, the surrounding environment using sustainable energy practices	8	core
		2.7	Unexpected situations are dealt with safely and with the approval of an authorised person	6	core
3	**Install and connect LV appliances, switchgear and associated accessories**	**3.1**	Appliances, switchgear and accessories are installed to comply with technical standards and job specifications and requirements with sufficient access to affect terminations, adjustment and maintenance	19	15
		3.2	Accessories are installed straight and square in the required locations and within acceptable tolerances	19	15
		3.3	Wiring is terminated at appliances, switchgear and accessories in accordance with manufacturer specifications and functional and regulatory requirements	19	15

		3.4	Ongoing compliance and safety inspections of the installed appliances, switchgear and accessories are undertaken	6	core
		3.5	Defects revealed through on-going compliance and safety inspection are rectified	6	core
		3.6	Installation is carried out efficiently without unnecessary waste of materials or damage to apparatus, circuits, the surrounding environment or services using sustainable energy principles	19	15
		3.7	Unexpected situations are dealt with safely and with the approval of an authorised person	6	core
4	**Complete work and document activities**	**4.1**	WHS/OHS work completion risk control measures and procedures are followed	1	1
		4.2	Worksite is cleaned and made safe in accordance with workplace procedures	8	Core
		4.3	'As-installed' cables/wiring, appliances, switchgear and accessories are documented and an appropriate person/s notified in accordance with workplace procedures	7,19	15

UEEEL0039 Design, install and verify compliance and functionality of general electrical installations

ELEMENTS		PERFORMANCE CRITERIA		QUESTION	PRACTICAL TASK
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Prepare to design, install, inspect and test an electrical installation**	**1.1**	WHS/OHS control measures for the site are identified and applied	1	1
		1.2	WHS/OHS risk control measures and workplace procedures are followed in preparation for work	1	1
		1.3	Safety hazards, which have not previously been identified, are noted and risk control measures are implemented	4	core
		1.4	Installation documentation and/or relevant industry standard are reviewed and applied	1	1

		1.5	Appropriate person/s is consulted to ensure work is coordinated with others involved on the worksite	5	core
		1.6	Need to test or measure live electrical work is determined in accordance with WHS/OHS requirements and conducted in accordance with workplace safety procedures	1	1
		1.7	Circuits, machines and/or plant are isolated in accordance with WHS/OHS job requirements and workplace procedures	20	16
		1.8	Installation of wiring, appliances, switchgear, control gear and associated accessories is planned and appropriately sequenced in consultation with relevant person/s	Gap 1	Gap 1
		1.9	Locations of appliances, switchgear, accessories and cable routes are planned within the constraints of building structure, other services, specifications and regulatory requirements	20	16
		1.10	Tools, equipment and testing devices needed to verify compliance are obtained in accordance with workplace procedures and checked for correct operation and safety	5	core
		1.11	Preparatory work is checked to ensure it complies with planned specifications and no damage has occurred	5	core

2	**Select wiring systems, cables, control and protection for general electrical installations**	**2.1**	Wiring system is selected and suitable for the environments in which it will operate	20	16
		2.2	Cable conductor sizes are selected to meet current-carrying capacity requirements and voltage-drop and earth fault-loop impedance limitations in accordance with relevant industry standards	20	16
		2.3	Protective devices are selected to meet the required switching and tripping currents coordination and discrimination for overload and short circuit protection in accordance with relevant industry technical standards	20	16
		2.4	Earthing system components are selected to meet multiple earthed neutral (MEN) system in accordance with relevant industry standards	20	16
		2.5	Residual current devices (RCDs) are selected to meet the required circuit switching and tripping currents in accordance with relevant industry technical standards	Gap 2	Gap 2
		2.6	Switchgear/control gear is selected to meet current and voltage requirements and confirmed suitable for environmental conditions (ingress protection (IP) ratings) and functional requirements	20	16
		2.7	Switchboards are arranged to accommodate control and protective devices, links, safety services and other distributor equipment in accordance with relevant industry technical standards	20	16

3	**Install low voltage (LV) wiring and associated accessories**	**3.1**	Wiring and accessories are installed and terminated to comply with technical standards and job specifications and requirements	19	15
		3.2	Cables and conductors are terminated at accessories in accordance with manufacturer specifications and regulatory requirements	19	15
		3.3	Ongoing compliance and safety inspection of installed wiring systems and testing of installed circuits is undertaken	Gap 3	Gap 3
		3.4	Defects revealed through ongoing compliance and safety inspection and tests are rectified	Gap 4	Gap 4
4	**Install and connect LV appliances, switchgear and associated accessories**	**4.1**	Appliances, switchgear and accessories are installed to comply with technical standards and job specifications and requirements with sufficient access to affect terminations, adjustment and maintenance	19	15
		4.2	Wiring is terminated at appliances, switchgear and accessories in accordance with manufacturer specifications and functional and regulatory requirements	19	15
		4.3	Ongoing compliance and safety inspections of the installed appliances, switchgear and accessories are undertaken	Gap 4	Gap 4
		4.4	Defects revealed through ongoing compliance and safety inspection are rectified	Gap 4	Gap 4
5	**Visually inspect and conduct safety testing**	**5.1**	Wiring is checked for suitability within the environments in which it is installed	20	16

	on electrical installation		to ensure it is suitably protected from damage or overheating in accordance with relevant industry standards		
		5.2	Cable conductor sizes are compliant with current-carrying capacity, voltage-drop and fault-loop impedance limitations in accordance with relevant industry standards	20	16
		5.3	Protection methods and devices are verified as meeting coordination requirements for overload and short-circuit protection in accordance with relevant industry standards	20	16
		5.4	Switchgear and control gear rating is verified as being appropriate and meets functional requirements in accordance with relevant industry standards	20	16
		5.5	Electrical equipment inspection and testing evidence is cited and verified in accordance with WHS/OHS safety regulations	Gap 5	Gap 5
		5.6	Earthing system and components are located correctly, and conductor selection sizes are verified	20	16
		5.7	Markings on switchboards are checked for accuracy and clarity and comply with requirements	20	16
		5.8	Mandatory tests are conducted in accordance with relevant industry standards	20	16
		5.9	Testing is conducted to verify fault-loop impedance is sufficiently low and	20	16

			RCDs operate in accordance with relevant industry standards		
6	**Report inspection and test findings**	**6.1**	WHS/OHS risk control work completion measures and procedures are followed	1	1
		6.2	Worksite is cleaned and made safe in accordance with workplace procedures	8	core
		6.3	Non-compliance defects are identified and reported in accordance with workplace procedures	7	core
		6.4	Recommendations for rectifying defects are made in accordance with workplace procedures	7	core

Installation of wiring, appliances, switchgear, control gear and associated accessories is planned and appropriately sequenced in consultation with relevant person/s	Gap 1

TASKS

- Outline cable types used in electrical ionstallation
- Explain selecting wiring system compatible with the installation conditions,
- Explain selecting cables that comply with required current-carrying capacity and voltage
- What is earth fault-loop impedance limitations, ?
- Write down the procedures on coordination between protective devices

Residual current devices (RCDs) are selected to meet the required circuit switching and tripping currents in accordance with	Gap 2

relevant industry technical standards	

TASKS

- Sketch the RCD and explain its operation.
- What are the types of RCDs?

Ongoing compliance and safety inspection of installed wiring systems and testing of installed circuits is undertaken	Gap 3

TASKS

- What are safety measures to be taken while installing electrical wiring?
- How often should wiring be inspected?
- What are the safety practices and procedures that need to be observed when wiring and testing electrical equipment?
- Why do we have to inspect the wiring installation?
- What Australian standard gives recommended testing arrangements for ongoing periodic inspection of the general electrical installations?
- Who is responsible for verifying that electrical installation work is safe and complies with Australian standards under the relevant legislation?

Defects revealed through ongoing compliance and safety inspection are rectified	Gap 4

TASKS

- What are common problems occur during electrical installation?
- What are the common faults in domestic electrical installation?
- What are three hazards to be aware of when carrying out maintenance or breakdown electrical work?
- What are the 3 safety components in the wiring system?
- What should be checked for the assurance of safety when using electrical equipment?

Electrical equipment inspection and testing evidence is cited and verified in accordance with WHS/OHS safety regulations	Gap 5

TASKS

- Describe Periodic inspection and testing
- Explain Visual inspection.
- What items shall be checked, where applicable during the visual inspection, to assess that the relevant requirements of AS 3000 are satisfied?

Fill the blank

- Clause _____ on the electrical installation to verify that it complies with the requirements of this Standard and that it is suitable for the use intended.
- Which section of AS3000:2018 outline Verification and Testing of electrical installation?

UEEEL0018 Select wiring systems and select cables for low voltage electrical installations

ELEMENTS		PERFORMANCE CRITERIA		QUESTION	PRACTICAL TASK
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Plan wiring systems for general electrical installations**	**1.1**	Scope and nature of the electrical installation is determined from job specifications	5	GC
		1.2	WHS/OHS requirements and workplace procedures and other regulatory requirements are identified and applied	1	1
		1.3	Cable routes, the route lengths of cable, and the conditions in which the wiring system is to operate is determined from job specifications or from consultation with appropriate person/s	21	17

2	**Select wiring systems and cables for general electrical installations**	**2.1**	Wiring system is selected and suitable for the environments in which it will operate	21	17
		2.2	Cable conductor sizes are selected to meet current-carrying capacity requirements and voltage-drop and earth fault-loop impedance limitations in accordance with relevant industry standards	21	17
		2.3	Circuit protective devices are selected to meet requirement for co-ordination with conductor current-carrying capacity in accordance with relevant industry standards	21	17
		2.4	Earthing system components are selected to meet multiple earthed neutral (MEN) system in accordance with relevant industry standards	21	17
3	**Document electrical installation**	**3.1**	Manufacturer data is referenced in selection of equipment to ensure materials comply with safety requirements and relevant industry standards	21	17
		3.2	Rationale for wiring system selections and calculations are documented in accordance with workplace procedures	21	17
		3.3	Electrical installation arrangement and specifications for all selected items are documented in accordance with workplace procedures and forwarded to	21	17

			appropriate person/s		

UEEEL0014 Isolate, test and troubleshoot low voltage electrical circuits

ELEMENTS		PERFORMANCE CRITERIA		QUESTION	PRACTICAL TASK
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Prepare to isolate, test and troubleshoot electrical circuits**	**1.1**	Scope of work to be undertaken is determined from relevant documentation, electrical drawings or relevant person/s	5	Core
		1.2	WHS/OHS requirements and workplace procedures for a given work area are identified and applied	1	1
		1.3	Electrical hazards are identified, risks are assessed, and control measures are implemented	1	1
		1.4	Relevant industry standards, regulation, legislation and workplace procedures are identified and applied	1	1
		1.5	Advice is sought from the work supervisor to ensure the work is coordinated	5	Core

			effectively with others		
2	**Apply safe isolation, lock-out and tag-out procedures**	**2.1**	Electrical circuits and conductors, all of their energy sources, and isolation points are identified	5	Core
		2.2	Electrical circuits are isolated from all energy sources and secured in accordance with industry and regulatory standards	5	Core
		2.3	Safe isolation from all sources of energy is confirmed	5	Core
		2.4	Isolation is secured using appropriate devices, tags, lock-out or permit system	5	Core
		2.5	Any stored energy is discharged and deenergisation proved	5	Core
		2.6	Unused conductors and equipment are dealt with in accordance with regulatory requirements	5	Core
3	**Conduct compliance inspection and testing on electrical circuits**	**3.1**	Electrical circuits are visually inspected for compliance with regulatory requirements	5	Core
		3.2	Mandatory tests are identified, including sequence of tests and equipment required	22	18
		3.3	Continuity of the earthing system is tested for compliance with regulatory requirements	22	18

		3.4	Insulation resistance of the circuit is tested for compliance with regulatory requirements	20	16
		3.5	Polarity of the circuit is tested for compliance with regulatory requirements	20	16
		3.6	Correct circuit connections is tested for compliance with regulatory requirements	20	16
		3.7	Alternative supply systems are inspected and tested for compliance with industry and regulatory standards	20	16
		3.8	Earth fault loop impedance is verified for compliance with regulatory requirements	20	16
		3.9	Operation of residual current devices (RCDs) is tested for compliance with regulatory requirements	20	16
		3.10	Compliance test results are documented and reported in accordance with industry and workplace requirements	8	Core
		3.11	Non-compliances are identified and reported to relevant personnel	8	Core
		3.12	Requirements for the verification of circuits are completed in accordance with regulatory requirements	8	Core
4	**Locate, identify and repair faults in**	**4.1**	Circuits/machines/plant are checked as being isolated, where necessary, in strict	8	Core

	electrical circuits		accordance WHS/OHS requirements and procedures		
		4.2	Safety hazards resulting from the fault or breakdown are documented and risk control measures identified and implemented in consultation with appropriate person/s	1	1
		4.3	Troubleshooting of electrical circuits is undertaken methodically using measured and calculated values of circuit parameters	22	18
		4.4	Circuit components are dismantled and parts stored to protect against loss or damage	22	18
		4.5	Faulty circuits/components are rechecked and their fault status identified	22	18
		4.6	Materials/replacement parts required to rectify faults are sourced and obtained in accordance with workplace procedures	22	18
		4.7	Effectiveness of the repair is tested in accordance with workplace procedures	22	18
		4.8	Circuit is reassembled, tested and prepared for return to service	22	18
		4.9	Unexpected situations are dealt with safely and with the approval of authorised person/s	22	18
		4.10	Troubleshooting and repair activities are carried out without damage to	22	18

			equipment, circuits, the surrounding environment or services using sustainable energy practices		
5	**Complete work and document activities**	**5.1**	WHS/OHS work completion risk control measures and workplace procedures are followed	1	1
		5.2	Work area is cleaned and made safe in accordance with workplace procedures	8	Core
		5.3	Work completion is documented and appropriate person/s notified in accordance with workplace procedures	8	Core

UEEEL0005 Develop and connect electrical control circuits			
ELEMENTS	**PERFORMANCE CRITERIA**	**QUESTION**	**PRACTICAL**

					TASK
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Develop electrical control circuits**	**1.1**	WHS/OHS requirements and workplace procedures for a given work area are identified obtained and applied	1	1
		1.2	Control circuit/s requirements are determined from discussions with relevant person/s and documented in accordance with workplace procedures	1	1
		1.3	Agreement for the control circuit/s requirement is sought from appropriate person/s and documented in accordance with workplace procedures	1	1
		1.4	Schematic arrangement of control circuits that complies with agreed requirement is documented in accordance with workplace procedures	4	3
		1.5	Wiring diagram of control circuits is developed from schematic diagram in accordance with workplace procedures	5	Core
		1.6	Materials needed to connect control circuit/s are obtained in accordance with workplace procedures and checked against job requirements	5	Core
		1.7	Tools, equipment and testing devices needed to connect control circuit/s are obtained in accordance with workplace procedures and checked for correct operation and safety	5	Core

		1.8	Preparatory work is checked to ensure no damage has occurred and complies with control circuit/s application requirements	5	Core
2	**Connect and test electrical control circuits**	**2.1**	WHS/OHS risk control measures and workplace procedures for carrying out work are followed	1	1
		2.2	Need to test or measure live electrical work is determined in accordance with WHS/OHS requirements and conducted within established safety workplace procedures	1	1
		2.3	Circuits/machines/plant are checked and isolated as required in accordance with WHS/OHS requirements and workplace procedures	23	19
		2.4	Control circuit component/s are connected to comply with the agreed control requirements	23	19
		2.5	Control circuit operation is tested for functionality and in accordance with WHS/OHS requirements and workplace safety procedures	23	19
		2.6	Non-compliant control functions are rectified	6	Core
		2.7	Unplanned situations are dealt with safely and with the approval of an authorised person in accordance with workplace procedures in a manner that minimises risk to personnel and equipment	6	Core
		2.8	Control circuits are connected, inspected and tested without unnecessary waste	8	Core

			of materials or damage to apparatus, circuits, the surrounding environment or services using sustainable energy practice		
3	**Complete and document circuit development activities**	**3.1**	WHS/OHS work completion risk control measures and workplace procedures are followed	1	1
		3.2	Worksite is cleaned and made safe in accordance with workplace procedures	8	Core
		3.3	'As-connected' control circuits are documented using standard drawing conventions and appropriate person/s notified in accordance with workplace procedures	7	Core

UEEEL0024 Test and connect alternating current (a.c.) rotating machines			
ELEMENTS	**PERFORMANCE CRITERIA**	**QUESTION**	**PRACTICAL TASK**
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.		

1	**Prepare to test and connect a.c. rotating machines**	**1.1**	Nature of machine/s problem is obtained from relevant documentation or work supervisor to determine scope of work	11	20
		1.2	WHS/OHS requirements and workplace procedures for a given work area are identified and applied	11	20
		1.3	Hazards are identified, risks are assessed, and control measures are implemented	11	20
		1.4	Materials required for work are determined in accordance with workplace procedures	11	20
		1.5	Tools, equipment and testing devices required for work are obtained and confirmed fit for purpose and serviceable in accordance with workplace procedures	11	20
2	**Test and connect a.c. rotating machines**	**2.1**	WHS/OHS risk control measures and workplace procedures for carrying out work are followed	11	20
		2.2	Need to test or measure live work is determined in accordance with WHS/OHS job safety assessment requirements and work is conducted using safety control measures and workplace procedures	11	20
		2.3	Relevant circuits, machines and/or plant are checked as being isolated, as	11	20

			required in accordance with WHS/OHS requirements and workplace procedures		
		2.4	Problem-solving techniques are used to resolve problems from measured and calculated values as they apply to a.c. rotating machines	11	20
		2.5	Machine is verified as electrically safe and connected to electrical supply and commisioned in accordance with workplace procedures and industry standards	11	20
		2.6	Unplanned situations are dealt with safely and with the approval of an authorised person/s	11	20
		2.7	Problems dealt with safely and without damage to machines, the surrounding environment or services using sustainable energy practices	11	20
3	**Complete work and document activities**	**3.1**	WHS/OHS work completion risk control measures and workplace procedures are followed	11	20
		3.2	Worksite is cleaned and made safe in accordance with workplace procedures	11	20
		3.3	Justification for solutions used to solve problems is documented in accordance with workplace procedures	11	20
		3.4	Work completion is documented and an appropriate person/s notified in accordance with workplace procedures	11	20

UEEEL0021 Solve problems in magnetic and electromagnetic devices

ELEMENTS		PERFORMANCE CRITERIA		QUESTION	PRACTICAL TASK
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Prepare to work with electromagnetic devices and circuits**	**1.1**	WHS/OHS requirements and workplace procedures for a given work area are identified and applied	11	20

		1.2	Device/s and/or circuit/s problems are identified from documentation or work supervisor to determine scope of work	11	20
		1.3	Hazards are identified, risks are assessed and control measures are implemented	11	20
		1.4	Tools, equipment and testing devices to carry out work are obtained and checked for correct operation and safety	11	20
		1.5	Circuits are checked and isolated in accordance with workplace procedures and regulatory requirements	11	20
		1.6	Advice is sought from the work supervisor to ensure work is coordinated effectively with others	11	20
2	**Solve electromagnetic device and/or circuit problems**	**2.1**	WHS/OHS risk control measures and workplace procedures for carrying out work are followed	11	20
		2.2	Need to test or measure live work is determined in accordance with WHS/OHS job safety assessment requirements and work is conducted using safety control measures workplace procedures	11	20
		2.3	Relevant circuits and devices are checked as being isolated, as required, in accordance with WHS/OHS requirements and workplace procedures	11	20
		2.4	Operating parameters of an existing circuit with an electromagnetic device are determined	11	20

		2.5	Methodical techniques are used to resolve circuit problems from measured and calculated values as they apply to electromagnetic devices/circuits	11	20
		2.6	Existing circuit with an electromagnetic device is altered to comply with specified operating parameters	11	20
		2.7	Circuit with electromagnetic device is developed to comply with a specified function and operating parameters	11	20
		2.8	Electrical equipment is connected and tested to determine correct operation	11	20
		2.9	Unplanned situations are responded to in accordance with workplace procedures in a manner that minimises risk to personnel and equipment	11	20
		2.10	Problems are resolved without damage to apparatus, circuits, the surrounding environment or services using sustainable energy practices	11	20
3	**Complete work and documentation**	**3.1**	WHS/OHS work completion risk control measures and workplace procedures are followed	11	20
		3.2	Worksite is cleaned and made safe in accordance with workplace procedures	11	20
		3.3	Justification for solutions used to resolve problems is documented in accordance with established workplace procedures	11	20
		3.4	Work completion is documented and appropriate person/s notified in	11	20

			accordance with workplace procedures		

UEEEL0020 Solve problems in low voltage a.c. circuits					
ELEMENTS		**PERFORMANCE CRITERIA**		**QUESTION**	**PRACTICAL TASK**
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Identify low voltage (LV) a.c. circuit problem**	**1.1**	WHS/OHS requirements and workplace procedures for work area are identified and applied	15	28
		1.2	Hazards are identified, risks are assessed and control measures and workplace procedures are implemented	15	28
		1.3	Safety hazards which have not previously been identified are noted on job	15	28

			safety assessments and existing risk control measures are implemented		
		1.4	Circuit problems are identified from documentation or work supervisor to determine the scope of work	15	28
		1.5	Advice is sought from the work supervisor to ensure work is coordinated effectively with others	15	28
		1.6	Sources of materials required for work are identified in accordance with workplace procedures	15	28
		1.7	Tools, equipment and testing devices to carry out work are obtained and checked for correct operation and safety	15	28
2	**Solve LV a.c. circuit problems**	**2.1**	WHS/OHS risk control measures and workplace procedures for carrying out work are followed	15	28
		2.2	Need to test or measure live work is determined in accordance with WHS/OHS requirements and, as required, conducted in accordance with workplace safety procedures	15	28
		2.3	Circuits/machines/plant are checked and isolated, as required, in accordance with WHS/OHS requirements and workplace procedures	15	28
		2.4	Methodical techniques are used to resolve circuit problems from measured and calculated values as they apply to single and three phase LV circuits in	15	28

			accordance with workplace procedures		
		2.5	Existing circuits are altered to comply with power factor correction in compliance with industry standards	15	28
		2.6	Power factor of a circuit is calculated from given measurements	15	28
		2.7	Low power factor is improved by altering the reactive power of a circuit	15	28
		2.8	Unplanned situations are responded to in accordance with workplace procedures in a manner that minimises risk to personnel and equipment	15	28
		2.9	Problems are resolved without damage to apparatus, circuits, the surrounding environment or services using sustainable energy practices	15	28
3	**Complete work and document activities**	**3.1**	WHS/OHS work completion risk control measures and workplace procedures are followed	15	28
		3.2	Worksite is cleaned and made safe in accordance with workplace procedures	15	28
		3.3	Justification for solutions used to resolve circuit problems is documented in accordance with workplace procedures	15	28
		3.4	Work completion is documented and an appropriate person/s notified in accordance with workplace procedures	15	28

UEEAS0007 Assemble, mount and connect control gear and switchgear					
ELEMENTS		**PERFORMANCE CRITERIA**		**QUESTION**	**PRACTICAL TASK**
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Plan to assemble, mount and connect control gear and switchgear**	**1.1**	Switchgear and control gear assembly installation is determined and planned in accordance with job specifications, wiring and schematic diagrams	26	21
		1.2	Work health and safety (WHS)/occupational health and safety (OHS) requirements and workplace procedures for a given work area are identified and applied	26	21
		1.3	Work instructions, including layout and wiring diagrams, are applied in accordance with workplace procedures	26	21

		1.4	Advice is sought from supervisor to ensure work is coordinated effectively with relevant person/s	26	21
		1.5	Materials required for the control gear and switchgear installation work are obtained in accordance with workplace procedures	26	21
		1.6	Tools, equipment and measuring devices required to carry out work are obtained and checked for correct operation and safety	26	21
2	**Assemble, mount and connect control gear and switchgear**	**2.1**	Switchgear and control gear assembly hazards are identified, risks assessed and control measures are implemented in accordance with workplace procedures	26	21
		2.2	Circuits are checked and isolated in accordance with WHS/OHS workplace requirements and procedures	26	21
		2.3	Component layout is in accordance with job specifications, wiring and schematic diagrams	26	21
		2.4	Switchgear/control gear is fitted in accordance with work instructions, industry standards, manufacturer specifications and workplace procedures	26	21
		2.5	Interconnections are made in accordance with work instructions, industry standards and workplace procedures	26	21
		2.6	Regular quality checks are carried out in accordance with workplace procedures	26	21

		2.7	Completed switchboard function is tested in accordance with workplace procedures, industry standards and manufacturer specifications	26	21
		2.8	Labelling and numbering cable are undertaken in accordance with industry standards, wiring and schematic diagrams	26	21
		2.9	Unplanned events are referred to supervisor for directions in accordance with workplace procedures	26	21
		2.10	Assembly work is carried out without waste of materials or damage to apparatus, the surrounding environment or services and using sustainable energy practices	26	21
3	**Finalise and inspect assembled control gear and switchgear installation**	**3.1**	Assembled switchboard panel is visually inspected and checked against work instructions, industry standards and manufacturer specifications in accordance with workplace procedures	26	21
		3.2	Problem-solving techniques are used where corrective actions to assembled components are required in accordance with regulatory requirements and industry standards	26	21
		3.3	Work completion is documented and relevant person/s notified in accordance with workplace procedures	26	21

UEECS0033 Use engineering applications software on personal computers

ELEMENTS		PERFORMANCE CRITERIA		QUESTION	PRACTICAL TASK
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Prepare to use computer application software**	**1.1**	Work health and safety (WHS)/occupational health and safety (OHS) requirements and workplace procedures for an engineering work area are identified, obtained and applied	1,2	1
		1.2	WHS/OHS risk control measures and procedures in relation to computer and keyboard use are followed in accordance with workplace procedures	1	1
		1.3	Application software and information/instructions required for use are obtained	5	Core
		1.4	On-screen instructions in relation to any anomaly are followed in accordance with workplace procedures	5	Core
		1.5	Help menu is used to resolve any common start-up, access issues or anomalies	27	23
2	**Use engineering software application**	**2.1**	WHS/OHS risk control measures and workplace procedures for carrying out work are followed	27	1

		2.2	Techniques specific to software packages are used to produce relevant files and engineering information	27	23
		2.3	Checks are made to ensure accuracy of information produced	27	21
3	**Output information from software application**	**3.1**	Completed files are stored appropriately in accordance with workplace policies and procedures	27	23
		3.2	Files are printed and stored electronically as formal records and/or forwarded to relevant personnel	27	23
4	**Shut down computer**	**4.1**	Files are named, arranged, saved and backed up in accordance with workplace policies and procedures	27	23
		4.2	Computer shutdown procedures are followed in accordance with workplace procedures and computer powered off	27	23

UEEEL0003 Arrange circuits, control and protection for electrical installations

ELEMENTS		PERFORMANCE CRITERIA		QUESTION	PRACTICAL TASK
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Prepare electrical circuits, control and protection installation**	**1.1**	The extent and nature of the electrical installation is determined from job specifications	31	27
		1.2	Hazards are identified, risks are assessed and control measures are implemented	31	27
		1.3	Load requirements for individual current-using equipment is determined from job specifications and/or consultation with appropriate persons	31	27
2	**Arrange electrical circuits, control and protection**	**2.1**	Circuits, control and protective devices are arranged to ensure safe and functional operation of the installation and to comply with relevant industry technical standards and job specification requirements	31	27
		2.2	Earthing is arranged and terminated to comply with the multiple earthed neutral (MEN) system requirements	31	27
		2.3	Protective devices are selected to meet the required switching and tripping currents coordination and discrimination for overload and short circuit	31	27

			protection in accordance with relevant industry technical standards		
		2.4	Residual current devices (RCDs) are selected to meet the required circuit switching and tripping currents, in accordance with relevant industry technical standards	31	27
		2.5	Switchgear/control gear is selected to meet current and voltage requirements and confirmed suitable for environmental conditions (ingress protection (IP) ratings) and functional requirements	31	27
		2.6	Switchboards are arranged to accommodate control and protective devices, links, safety services and other distributor equipment in accordance with relevant industry technical standards	31	27
3	**Document electrical installation circuits, control and protection arrangements**	**3.1**	Evidence is obtained from manufacturer/suppliers that electrical equipment selected complies with safety requirements in accordance with workplace procedures	31	27
		3.2	Device selection/s rationale and calculations are documented in accordance with workplace procedures	31	27
		3.3	Electrical installation and specifications for selected items are documented in accordance with workplace procedures and forwarded to appropriate person/s	31	27

UEEIC0013 Develop, enter and verify discrete control programs for programmable controllers			
ELEMENTS	**PERFORMANCE CRITERIA**	**QUESTION**	**PRACTICAL TASK**

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Identify control system requirements**	**1.1**	PLC operating functions, parameters and specifications are determined from relevant documentation, electrical drawings or persons to determine the control system scope of work	24	30
		1.2	Work health and safety (WHS)/occupational health and safety (OHS) requirements and workplace procedures for a given work area are identified and applied	1	Core
		1.3	Control system scenario is developed from job specifications of process/plant/machine controlled through consultation with relevant person/s	24	30
		1.4	PLC block diagram is developed using industry standard symbols	24	30
		1.5	Infotechnology equipment, software and measuring devices needed to carry out the PLC work are obtained and checked for correct operation and safety	24	30
		1.6	Installation of PLC is checked for compliance with relevant industry standards, regulations and job specifications	24	30
2	**Develop control system, enter and test program**	**2.1**	Established WHS/OHS risk control measures and procedures for carrying out the work are followed.	6	Core
		2.2	Circuits/machines/plant are checked and isolated in accordance with workplace	24	30

			procedures		
		2.3	Control system solutions are developed and documented based on specified control mode and using acceptable methods for designing control systems	24	30
		2.4	Developed control system is converted to an appropriate form	24	30
		2.5	Program is entered into the PLC using appropriate infotechnology and software	24	30
		2.6	Entered instructions and settings are tested in accordance with job specifications by control system scenario	24	30
		2.7	Appropriate methods and tools are used to test control system and operating faults and anomalies are identified and rectified	24	30
		2.8	Unplanned situations are responded to in accordance with workplace procedures, in a manner that minimises risk to persons and equipment		
3	**Verify document and report programming activities**	**3.1**	WHS/OHS work completion risk control measures and procedures are followed	1	Core
		3.2	Program is transferred from PLC to external medium for storage	24	30
		3.3	Control system specification and program are documented in accordance with workplace procedures	24	30
		3.4	Work completion is documented and relevant persons notified in accordance	24	30

			with workplace procedures		

	UEECO0023 Participate in electrical work and competency development activities		
ELEMENTS	**PERFORMANCE CRITERIA**	**QUESTION**	**PRACTICAL TASK**
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.		

1	**Engage in a competency development plan**	**1.1**	Context and conditions under which the competency development plan is to be undertaken are identified and confirmed	30	26
		1.2	Roles and obligations of all parties/stakeholders with respect to the competency development plan are identified and confirmed	30	26
		1.3	Competency development plan is agreed upon, finalised and executed by all relevant parties/stakeholders	30	26
2	**Participate in electrical competency development work activities**	**2.1**	Industry/organisational policies and procedures for work and competency development activities are identified, obtained and reviewed	30	26
		2.2	Electrical work is undertaken in accordance with the competency development plan and applicable industry/organisational policies and procedures	30	26
		2.3	Opportunities to practise skills and apply knowledge relevant to the development of competency are utilised	30	26
3	**Monitor and report on competency development**	**3.1**	Records of competency development work activities are maintained and updated on a regular basis	30	26
		3.2	Obligations are met for periodic and timely reporting of competency development activities	30	26

		3.3	Periodic competency development report is verified and validated by appropriate person/s within accepted industry timelines	30	26
		3.4	Progress in the competency development plan is self-monitored and assistance is sought from appropriate person/s to overcome difficulties or deficiencies	30	26
		3.5	Modifications to the competency development plan are made in consultation with appropriate person/s	30	26

UEERE0001 Apply environmentally and sustainable procedures in the energy sector

ELEMENTS	**PERFORMANCE CRITERIA**	**QUESTION**	**PRACTICAL TASK**
Elements describe the	Performance criteria describe the performance needed to demonstrate achievement of the element.		

essential outcomes.					
1	**Identify sustainable work practice**	**1.1**	Activities are planned, prepared and sequenced to ensure work health and safety (WHS)/occupational health and safety (OHS) policies and workplace procedures are followed in accordance with work requirements	1	Core
		1.2	Relevant personnel are consulted to ensure work is coordinated effectively with others	5	Core
		1.3	Materials required for the work are obtained and checked in accordance with workplace procedures and compliance with work requirements	5	Core
		1.4	Location that activities are to be undertaken is determined from job requirements	5	Core
		1.5	Workplace environmental risks and resource efficiency issues are identified	4	Core
2	**Apply sustainable work practice**	**2.1**	WHS/OHS policies and workplace procedures for undertaking administrative functions are followed	1	1
		2.2	Energy assessment is undertaken in accordance with requirements to implement techniques which produce energy reduction directly or indirectly	8.29	Core,25
		2.3	Approval is obtained for suggested improvements to energy efficient methods and components from relevant person/s before any contingencies are implemented	6	25

		2.4	Unplanned events or conditions are responded to in accordance with workplace procedures in a manner that minimises risk to personnel, equipment and environment	5	Core
		2.5	On-going checks of the quality of the work are undertaken in accordance with established procedures	5	Core
		2.6	Work is carried out efficiently without unnecessary waste of materials or damage to the surrounding environment while using sustainable work practices which minimise wastage of energy and materials either directly or indirectly	8	Core
3	**Complete workplace documentation**	**3.1**	Documentation/reports are completed to ensure detailed promotional activities requirements are met	7,29	25
		3.2	Suggestions are made to relevant person/s for improvement/s to workplace practices to minimise energy and materials wastage	5.29	25
		3.3	Workplace documentation is completed in accordance with workplace procedures	7	Core

UETDRRF004 Perform rescue from a live LV panel Core					
ELEMENTS		**PERFORMANCE CRITERIA**		**QUESTION**	**PRACTICAL TASK**
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Prepare to perform rescue procedures from live LV panel**	**1.1**	Instruction in hazards and risk control measures for specific work functions and work areas are identified and obtained	33	33
		1.2	Electricity isolation point is identified and labelled, where appropriate	33	33

		1.3	Tools and emergency equipment are checked for safety, functionality and placed in an accessible location to facilitate response and rescue according to established procedures	33	33
2	**Carry out rescue from live LV panel**	**2.1**	Workplace procedures and work instructions for controlling risk are followed	33	33
		2.2	Workplace procedures for accessing and isolating the LV panel and removing the victim, where necessary, from contact with live apparatus are followed	33	33
		2.3	Workplace procedures for applying cardiopulmonary resuscitation (CPR), if required at the site, and gaining access to treatment by a medical professional, if necessary, are followed	33	33
		2.4	The worksite is secured and entry controlled until appropriate authorities inspect and release the site	33	33
3	**Complete the LV panel rescue procedure**	**3.1**	Processes for reporting accidents and/or incidents to authorised personnel are confirmed in accordance with established procedures	33	33

HLTAI009 Provide cardiopulmonary Resuscitation Core					
ELEMENTS		**PERFORMANCE CRITERIA**		**QUESTION**	**PRACTICAL TASK**
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	Respond to an emergency situation	1.1	Recognise and assess an emergency situation.	32	32
		1.2	Ensure safety for self, bystanders and casualty.	32	32
		1.3	Assess the casualty and recognise the need for cardiopulmonary resuscitation (CPR).	32	32
		1.4	Seek assistance from emergency services	32	32
2	Perform CPR procedures	2.1	Perform CPR in accordance with the ARC guidelines.	32	32

		2.2	Display respectful behaviour towards casualty..	32	32
		2.3	Operate an automated external defibrillator (AED) according to manufacturers' instructions	32	32
3	Communicate details of the incident.	3.1	Accurately convey incident details to emergency services..	32	32
		3.2	Report details of incident in line with appropriate workplace or site procedures.	32	32
		3.3	Maintain privacy and confidentiality of information in line with statutory or organisational policies	32	32
4	Review the incident.	4.1	Recognise the possible psychological impacts on self and other rescuers and seek help when required.	32	32
		4.2	Contribute to a review of the first aid response as required.	32	32

UEEEL0047 Identify, shut down and restart systems with alternate supplies. Core					
ELEMENTS		**PERFORMANCE CRITERIA**		**QUESTION**	**PRACTICAL TASK**
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.			
1	**Prepare to work on systems with alternate supplies**	**1.1**	Nature of the installation is obtained from appropriate written documentation, electrical drawings and/or relevant person/s to determine the scope of work	34	34
		1.2	WHS/OHS workplace procedures are obtained, interpreted and applied	34	34
		1.3	Hazards are identified, risks are assessed, and control measures are implemented	34	34
		1.4	Tools, equipment and circuit testing devices are obtained and checked for correct operation and safety in accordance with workplace procedures	34	34
		1.5	Work supervisor is consulted to ensure work is coordinated effectively with others	34	34

2	**Identify and isolate alternate supplies**	**2.1**	Labelling indicating generation system/s connected on site is located, interpreted and checked against electrical diagrams	34	34
		2.2	Switchboard, circuits and known supply are identified	34	34
		2.3	Site procedures for isolation and shutdown are obtained and interpreted	34	34
		2.4	Circuit to be isolated is identified and tested	34	34
		2.5	Shutdown procedures are completed in accordance with industry standards and workplace procedures	34	34
		2.6	Isolation of energy sources is completed and proved in accordance with workplace procedures, industry standards and regulatory requirements	34	34
		2.7	Systems are inspected and tested for compliance with industry and regulatory standards	34	34
		2.8	Battery storage system integrity is checked in accordance with industry standards and regulatory requirements	34	34
		2.9	System is re-instated after isolation	34	34
3	**Complete work and document records**	**3.1**	WHS/OHS work completion risk control measures and procedures are followed	34	34
		3.2	Worksite is cleaned and made safe in accordance with workplace procedures	34	34

		3.3	Work completion is documented, electrical drawings are updated, and relevant personnel are notified in accordance with workplace procedures and regulatory requirements	34	34

SECTION I

RPL Outcome and Further Action

Unit		RPL Granted	RPL Pending	Further action to grant RPL
UEECO0023	Participate in electrical work and competency development activities			
HLTAID009	Provide cardiopulmonary resuscitation			
UEECD0007	Apply work health and safety regulations, codes and practices in the workplace			
UEECD0019	Fabricate, assemble and dismantle utilities industry components			
UEECD0044	Solve problems in multipath circuits			
UEECD0046	Solve problems in single path circuits			
UEECD0020	Fix and secure electrotechnology equipment			
UEECD0051	Use diagrams, diagrams, schedules, standards, codes and specifications			
UEECD0016	Document and apply measures to control WHS risks associated with electrotechnology work			
UEEEL0024	Test and connect alternating current (a.c) rotating machines			
UEEEL0025	Test and connect transformers			
UEEEL0008	Evaluate and modify low voltage heating equipment and controls			
UEEEL0009	Evaluate and modify low voltage lighting circuits,equipment and controls			
UEEEL0010	Evaluate and modify low voltage socket outlets circuits			
UEEEL0003	Arrange circuits, control and protection for electrical installations			
UEEEL0019	Solve problems in direct current (d.c.) machines			

UEEEL0021	Solve problems in magnetic and electromagnetic devices			
UEEEL0020	Solve problems in low voltage a.c. circuits			
UEEEL0012	Install low voltage wiring, appliances, switchgear and associated accessories			
UEEEL0039	Design, install and verify compliance and functionality of general electrical installations			
UEEEL0023	Terminate cables, cords and accessories for low voltage circuits*			
UEEEL0018	Select wiring systems and select cables for low voltage electrical installations			
UEEEL0014	Isolate, test and troubleshoot low voltage electrical circuits			
UEEEL0005	Develop and connect electrical control circuits			
UEERE0001	Apply environmentally and sustainable			
UEEEL0047	Identify, shut down and restart systems with alternate supplies			
UETDRRF004	Perform rescue from a live LV panel*			
UEEDV0005	Install and maintain cabling for multiple access to telecommunication services			
UEEEL0033	Conduct electrical tests on LV electrical machines			

SECTION J

ACTION RECORD

END