



UET09
Electricity Supply Industry
Transmission, Distribution and Rail Sector Training
Package

Volume 2 — Part 2
Competency Standards Units

Volume 2 of 2

Table of Contents

Volume 2 Part 2	4
2.1 Competency Standards Units	4
Accessing the Competency Standard Units from this Industry Training Package...	4
Competency Standard Components	4
Structure of the Competency Standard Units	4
2.1 Competency standard units - Coding Structure	6
2.1.1 Cable Jointing Competency Standard Units	7
2.1.2 Distribution Competency Standard Units	8
2.1.3 Design Competency Standard Units	9
2.1.4 Cross Discipline Competency Standard Units	11
2.1.5 Industry Specific Cross Discipline Competency Standard Units	12
2.1.6 Rail Traction Competency Standard Units	14
2.1.7 Substation Competency Standard Units	15
2.1.8 System Operations Competency Standard Units	16
2.1.9 Transmission Competency Standard Units	17
2.1.10 Testing Competency Standard Units	18
2.1.11 Vegetation Competency Standard Units	19
2.1.13 Imported CSUs	20
2.1.14 Possible Skills Sets CSUs	23
2.2.1 Essential Knowledge and Associated Skills	24
Outline of Essential Knowledge and Associated Skills construction	24
2.2.2 Essential Knowledge and Associated Skills to Unit Matrix Map	25
EKAS Clauses to unit map within CII in ESI Vegetation Control	25
EKAS Clause to Unit Map for Units within CII qualification – Transmission Line Assembly	26
EKAS Clause to Unit Map for Units within CIII qualifications Part 1	27
EKAS Clause to Unit Map for Units within CIII qualifications Part 2	28
EKAS Clause to Unit Map for CIV ESI Power Systems	29
EKAS Clause to Unit Map for CIV ESI Substations	30
EKAS Clause to Unit Map for CIV ESI Network Infrastructure	31
EKAS Clause to Unit Map for Diploma and Advanced Diploma Power Systems CORE	32
EKAS Clause to Unit Map for Diploma and Advanced Diploma ESI Power Systems DESIGN Part 1	33
EKAS Clause to Unit Map for Diploma and Advanced Diploma ESI Power Systems DESIGN Part 2	34
EKAS Clause to Unit Map for Diploma and Advanced Diploma ESI Power Systems SYSTEM OPERATIONS	35
EKAS Clause to Unit Map for Diploma and Advanced Diploma ESI Power Systems TESTING	36

Volume 2 Part 2

2.1 Competency Standards Units

Accessing the Competency Standard Units from this Industry Training Package

This section of the national Electricity Supplied Industry Transmission, Distribution and Rail sector Training Package UET09 outlines the industry Competency Standard Units. Approximately 216 Competency Standard Units have been arranged into twelve (12) discipline categories for ease of presentation and to facilitate quick access and referencing for users.

Competency Standard Components

All Competency Standard Units found in this National Electricity Supply Industry Transmission, Distribution and Rail sector Training Package UET09 have been developed in accordance with DEEWR requirements with minor enhancements. All Parts in Volume 2 of this Training Package form an integrated component of each Competency Standard Unit and must be included when developing learning strategies and assessment processes.

Each Competency Standard Unit is interrelated and linked with the Definitions/Glossary and Essential Knowledge and Associated Skills sections of the Volume. It should be noted that the essential knowledge and associated skills have been separated from the Competency Standard Units to facilitate user-friendliness, applicability and future maintenance. This separate essential knowledge and associated skills forms an integral part of each Competency Standard Unit, and all assessment evidence activities and reporting processes will include and confirm achievement of this specification.

No Competency Standard Unit is to be used in isolation or exported without these interrelated components.

Structure of the Competency Standard Units

Section 1 provides the unit title and scope.

Section 2 provides for all of the pre-requisite and co-requisite standard units that are required for each individual competency standard unit, as well as a section on Literacy and Numeracy entry requirements.

Section 3 has further information in relation to the application of the units and any licence to practice advice for those assessing the Competency Standard Units with the potential licensing requirements that underpin the carrying out of work performed in the Competency Standard Unit.

Section 4 covers the competency field or discipline applying and section 5 the elements.

Section 6 provides detailed information on the required Essential Knowledge and Associated Skills (EKAS) to be delivered as a part of the competency standard. It includes the need to use and reference Volume 2 Part 2.2 of this Training Package for

the required detail and specification of the essential knowledge and associated skills applying to the unit.

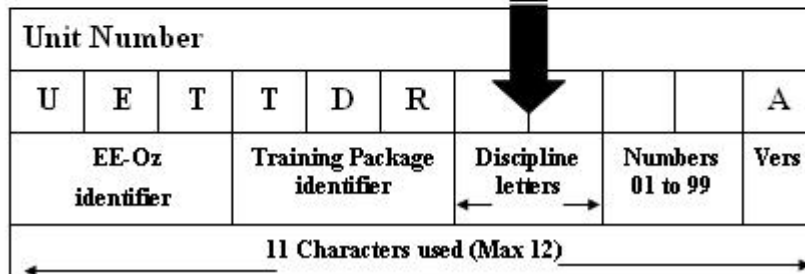
Section 7 relates to the competency standard unit as a whole providing the range of contexts and conditions to which the Performance Criteria apply. This Range Statement allows for different work environments and situations that will/may affect performance.

Section 8 covers the Evidence Guide that includes the overview of assessment; critical aspects of evidence required to demonstrate competency in the unit; context of assessment including resource implications; methods to be used in assessment of the learner and relationship to other competency standard units found in the Training Package.

For further information in relation to the competency standard units, users of this Training Package should refer to *Volume 1, Part 1 Qualifications* and *Volume 1, Part 2 Competency Standards*.

2.1 Competency standard units - Coding Structure

Part Number	Disciplines	Discipline Letters
2.1.1	Cable Jointing	CJ
2.1.2	Distribution	DP
2.1.3	Design	DS
2.1.4	Entry Level - Cross Discipline	EL
2.1.5	Industry Specific - Cross Discipline	IS
2.1.6	Rail Traction	RT
2.1.7	Substation	SB
2.1.8	System Operations	SO
2.1.9	Transmission	TP
2.1.10	Testing	TS
2.1.11	Vegetation	VC
2.1.12	Imported Units	Using own code



Note:

2.1.14 Possible Skills Sets CSUs

2.1.1 Cable Jointing Competency Standard Units

The following units have been grouped into the Discipline of Cable Jointing. They can be found in Qualifications within this Training Package across a number of AQF levels. Reference should be made to the Qualification Structure of Volume 1 Part 1 Qualification Framework to determine the relevant unit(s) pertaining to the qualification(s) required.

The Cable Jointing Discipline contains the following units:

UNIT CODE	UNIT TITLE
UETTDRCJ01B	Lay electrical cables
UETTDRCJ02B	Install and maintain de-energised LV underground paper insulated cables
UETTDRCJ03B	Install and maintain de-energised HV underground paper insulated cables
UETTDRCJ04B	Joint and maintain energised LV underground paper insulated cables
UETTDRCJ05B	Perform straight through HV paper insulated to polymeric transition joint
UETTDRCJ06B	Install and maintain de-energised LV underground polymeric cables
UETTDRCJ07B	Install and maintain de-energised HV underground polymeric cables
UETTDRCJ08B	Joint and maintain energised LV underground polymeric cables
UETTDRCJ09B	Install oil and gas filled specialised underground cables
UETTDRCJ10B	Maintain oil and gas filled specialised underground cables
UETTDRCJ11B	Install and maintain polymeric specialised underground cables
UETTDRCJ12B	Install and maintain oil & gas pressure systems for specialised underground cables
UETTDRCJ13B	Install and maintain network infrastructure LV underground cables
UETTDRCJ14B	Install and maintain network infrastructure HV underground cables

2.1.2 Distribution Competency Standard Units

The following units have been grouped into the Discipline of Distribution. They can be found in Qualifications within this Training Package across a number of AQF levels. Reference should be made to the Qualification Structure of Volume 1 Part 1 Qualification Framework to determine the relevant unit(s) pertaining to the qualification(s) required.

The Distribution Discipline contains the following units:

UNIT CODE	UNIT TITLE
UETTDRDP01A	Inspect overhead structures and electrical apparatus (Poles /Structures)
UETTDRDP02A	Maintain overhead energised LV conductors and cables
UETTDRDP03A	Maintain energised high voltage distribution overhead electrical apparatus (stick)
UETTDRDP04A	Maintain energised high voltage distribution overhead electrical apparatus (glove)
UETTDRDP05A	Inspect, maintain and restore energised LV overhead distribution network infrastructure

2.1.3 Design Competency Standard Units

The following units have been grouped into the Discipline of Design. They can be found in Qualifications within this Training Package across a number of AQF levels. Reference should be made to the Qualification Structure of Volume 1 Part 1 Qualification Framework to determine the relevant unit(s) pertaining to the qualification(s) required.

The Design Discipline contains the following units:

UNIT CODE	UNIT TITLE
UETDRDS01A	Draft and layout an overhead distribution extension
UETDRDS02A	Draft and layout an underground distribution extension
UETDRDS03A	Draft and layout a street lighting system
UETDRDS04A	Draft and layout a distribution substation minor upgrade
UETDRDS05A	Design overhead distribution systems
UETDRDS06A	Design underground distribution systems
UETDRDS07A	Design distribution substations
UETDRDS08A	Design public lighting systems
UETDRDS09A	Prepare and manage detailed construction plans for electrical system infrastructure
UETDRDS10A	Prepare and appraise financial impact statements
UETDRDS11A	Manage electrical infrastructure projects
UETDRDS12A	Investigate quality of supply issues
UETDRDS13A	Develop HV and LV distribution protection systems
UETDRDS14A	Design zone substations modifications
UETDRDS15A	Organise and implement line and easement surveys
UETDRDS16A	Develop planned outages strategies
UETDRDS17A	Review asset management strategies
UETDRDS18A	Analyse and appraise fault and outage data
UETDRDS19A	Establish and manage geographical information system data

UNIT CODE	UNIT TITLE
UETDRDS20A	Design customer substation
UETDRDS21A	Manage transmission and sub-transmission design process
UETDRDS22A	Design transmission and sub-transmission substation buildings
UETDRDS23A	Design transmission and sub-transmission substation primary plant
UETDRDS24A	Design transmission and sub-transmission protection and control
UETDRDS25A	Design transmission and sub-transmission substation earthing
UETDRDS26A	Design transmission and sub-transmission substation — civil and structural
UETDRDS27A	Design overhead transmission systems
UETDRDS28A	Design underground transmission systems

2.1.4 Cross Discipline Competency Standard Units

The following units have been grouped into the Discipline of Entry Level — Cross Discipline. They can be found in Qualifications within this Training Package across a number of AQF levels. Reference should be made to the Qualification Structure of Volume 1 Part 1 Qualification Framework to determine the relevant unit(s) pertaining to the qualification(s) required.

The Entry Level — Cross Discipline contains the following units:

UNIT CODE	UNIT TITLE
UETTDREL01A	Apply environment and sustainable energy procedures
UETTDREL02A	Operate plant and equipment near live electrical conductors/apparatus
UETTDREL03A	Comply with environmental and incidence response procedures
UETTDREL04A	Working safely near live electrical apparatus as non electrical worker

2.1.5 Industry Specific Cross Discipline Competency Standard Units

The following units have been grouped into the Discipline of Industry Specific — Cross Discipline. They can be found in Qualifications within this Training Package across a number of AQF levels. Reference should be made to the Qualification Structure of Volume 1 Part 1 Qualification Framework to determine the relevant unit(s) pertaining to the qualification(s) required.

The Industry Specific — Cross Discipline contains the following units:

UNIT CODE	UNIT TITLE
UETTDRIS01A	Install electrical equipment (Network Infrastructure)
UETTDRIS02A	Maintain electrical equipment (Network Infrastructure)
UETTDRIS03A	Perform LV field switching operation to a given schedule
UETTDRIS04A	Perform HV field switching operations to a given schedule
UETTDRIS05A	Perform substation switching to a given schedule.
UETTDRIS06A	Install and maintain network infrastructure electrical equipment
UETTDRIS07A	Sample, test, filter, and reinstate insulating oil
UETTDRIS08A	Develop HV switching schedule
UETTDRIS09A	Develop LV switching schedule
UETTDRIS10A	Coordinate permit procedures
UETTDRIS11A	Coordinate and direct switching schedules
UETTDRIS12A	Install and maintain poles/structures and associated hardware
UETTDRIS13A	Install and maintain public lighting systems
UETTDRIS14A	Install and maintain overhead conductors and cables (Poles and Structures)
UETTDRIS15A	Install and maintain low voltage services (Underground)
UETTDRIS16A	Install and maintain low voltage services (Overhead)
UETTDRIS17A	Conduct visual checking and treatment of poles and structures
UETTDRIS18A	Locate faults in underground power cables
UETTDRIS19A	Conduct high potential testing of underground power cables

UNIT CODE	UNIT TITLE
UETTDRIS20A	Install and replace energy meters and associated equipment
UETTDRIS21A	Install mobile generation set for synchronised Genset LV
UETTDRIS22A	Implement and monitor the organisational OHS policies, procedures and programs
UETTDRIS23A	Implement and monitor environmental and sustainable energy management policies and procedures
UETTDRIS24A	Install mobile generation set for synchronised Genset HV
UETTDRIS25A	Contribute to coordinate to high voltage live line work
UETTDRIS26A	Manage an ESI OHS management system
UETTDRIS27A	Install and maintain overhead distribution network infrastructure

2.1.6 Rail Traction Competency Standard Units

The following units have been grouped into the Discipline of Rail Traction. They can be found in Qualifications within this Training Package across a number of AQF levels. Reference should be made to the Qualification Structure of Volume 1 Part 1 Qualification Framework to determine the relevant unit(s) pertaining to the qualification(s) required.

The Rail Traction Discipline contains the following units:

UNIT CODE	UNIT TITLE
UETDRRT01A	Install overhead traction wiring systems
UETDRRT02A	Maintain overhead traction wiring systems
UETDRRT03A	Install traction bonds
UETDRRT04A	Maintain traction bonds
UETDRRT05A	Install overhead traction configurations
UETDRRT06A	Maintain overhead traction configurations
UETDRRT07A	Install overhead traction equipment and components
UETDRRT08A	Maintain overhead traction equipment and components
UETDRRT09A	Operate road rail traction height access equipment
UETDRRT10A	Perform rail traction switching operations to a given schedule
UETDRRT11A	Maintain energised DC traction overhead wiring system
UETDRRT12A	Maintain energised traction overhead electrical apparatus (Stick)
UETDRRT13A	Maintain energised traction overhead electrical apparatus (Glove)
UETDRRT14A	Install and maintain traction network wiring systems
UETDRRT15A	Install and maintain traction network equipment and components

2.1.7 Substation Competency Standard Units

The following units have been grouped into the Discipline of Substation. They can be found in Qualifications within this Training Package across a number of AQF levels. Reference should be made to the Qualification Structure of Volume 1 Part 1 Qualification Framework to determine the relevant unit(s) pertaining to the qualification(s) required.

The Substation Discipline contains the following units:

UNIT CODE	UNIT TITLE
UETTDRSB01A	Diagnose and rectify faults in power systems substation environment
UETTDRSB02A	Carry out substation inspections
UETTDRSB03A	Install and maintain substation DC systems
UETTDRSB04A	Maintain HV power system circuit breakers
UETTDRSB05A	Maintain HV power system — transformers and instrument transformers
UETTDRSB06A	Install high current DC switchgear and equipment
UETTDRSB07A	Maintain high current DC switchgear and equipment
UETTDRSB09A	Maintain HV regulating equipment — capacitor banks
UETTDRSB10A	Maintain HV power system static VAR compensators
UETTDRSB11A	Maintain HV power system synchronous condensers
UETTDRSB12A	Maintain voltage regulating equipment — on load Tapchangers
UETTDRSB13A	Install HV plant and equipment
UETTDRSB14A	Carry out Thermovision surveys
UETTDRSB15A	Maintain discrete protection and control systems
UETTDRSB16A	Commission discrete protection and control systems
UETTDRSB17A	Maintain distribution field devices
UETTDRSB18A	Commission distribution field devices

2.1.8 System Operations Competency Standard Units

The following units have been grouped into the Discipline of System Operations. They can be found in Qualifications within this Training Package across a number of AQF levels. Reference should be made to the Qualification Structure of Volume 1 Part 1 Qualification Framework to determine the relevant unit(s) pertaining to the qualification(s) required.

The System Operations Discipline contains the following units:

UNIT CODE	UNIT TITLE
UETTDRSO02A	Manage network faults
UETTDRSO03A	Manage critical events
UETTDRSO04A	Control generating plant
UETTDRSO05A	Manage HV distribution and subtransmission network demand
UETTDRSO06A	Develop LV distribution switching programs
UETTDRSO07A	Develop HV distribution and subtransmission switching programs
UETTDRSO08A	Develop and evaluate transmission switching programs
UETTDRSO09A	Coordinate LV distribution networks
UETTDRSO10A	Coordinate HV distribution and subtransmission networks
UETTDRSO11A	Manage transmission networks
UETTDRSO12A	Manage transmission network demand
UETTDRSO13A	Coordinate LV distribution network demand
UETTDRSO14A	Develop crisis management plans
UETTDRSO15A	Operate and monitor system equipment (SCADA)
UETTDRSO16A	Monitor and control the activities of field staff
UETTDRSO17A	Coordinate HV transmission network
UETTDRSO18A	Respond to discrete/ interdependent protection operations
UETTDRSO19A	Coordinate system operations in a regulated energy market
UETTDRSO20A	Respond to complex protection operations
UETTDRSO21A	Manage network power flows

2.1.9 Transmission Competency Standard Units

The following units have been grouped into the Discipline of Transmission. They can be found in Qualifications within this Training Package across a number of AQF levels. Reference should be made to the Qualification Structure of Volume 1 Part 1 Qualification Framework to determine the relevant unit(s) pertaining to the qualification(s) required.

The Transmission Discipline contains the following units:

UNIT CODE	UNIT TITLE
UETTD RTP02A	Establish and reinstate a transmission tower work site
UETTD RTP03A	Erect transmission towers
UETTD RTP04A	Erect transmission tower hardware
UETTD RTP05A	Pre-tension stringing transmission overhead conductors and cables
UETTD RTP06A	Erect transmission towers and associated hardware
UETTD RTP07A	Maintain transmission towers and associated hardware
UETTD RTP08A	Transmission tower stub setting
UETTD RTP09A	Install and maintain overhead conductors and cables (Towers)
UETTD RTP10A	Inspect overhead structures and electrical apparatus (Towers)
UETTD RTP11A	Maintain energised lines (Transmission) using live line stick technique
UETTD RTP12A	Maintain energised lines (Transmission) using Barehand Technique
UETTD RTP13A	Maintain energised lines (Transmission) using Barehand Technique on a helicopter platform
UETTD RTP14A	Install and maintain overhead transmission network infrastructure
UETTD RTP15A	Install and maintain transmission network infrastructure electrical equipment

2.1.10 Testing Competency Standard Units

The following units have been grouped into the Discipline of Testing. They can be found in Qualifications within this Training Package across a number of AQF levels. Reference should be made to the Qualification Structure of Volume 1 Part 1 Qualification Framework to determine the relevant unit(s) pertaining to the qualification(s) required.

The Testing Discipline contains the following units:

UNIT CODE	UNIT TITLE
UETTDRTS01A	Maintain network protection and control systems (Interdependent)
UETTDRTS02A	Commission network protection and control systems (Interdependent)
UETTDRTS03A	Conduct evaluation of power system faults within a substation
UETTDRTS04A	Develop testing and commissioning procedures for substation and field devices
UETTDRTS05A	Test and maintain metering schemes
UETTDRTS06A	Commission metering schemes
UETTDRTS07A	Perform accuracy checks on instrument transformers
UETTDRTS08A	Test, repair and calibrate protection relays
UETTDRTS09A	Develop secondary isolation instructional documents
UETTDRTS10A	Design secondary isolation instructional documents
UETTDRTS11A	Maintain, test and commission distribution field devices
UETTDRTS12A	Conduct evaluation of primary plant
UETTDRTS13A	Undertake project management of substation augmentation and maintenance
UETTDRTS14A	Install and maintain power system communication equipment
UETTDRTS15A	Maintain network protection and control systems (Complex)
UETTDRTS16A	Commission network protection and control systems (Complex)

2.1.11 Vegetation Competency Standard Units

The following units have been grouped into the Discipline of Vegetation. They can be found in Qualifications within this Training Package across a number of AQF levels. Reference should be made to the Qualification Structure of Volume 1 Part 1 Qualification Framework to determine the relevant unit(s) pertaining to the qualification(s) required.

The Vegetation Discipline contains the following units:

UNIT CODE	UNIT TITLE
UETTDRVC02A	Operate vegetation control plant, machinery and equipment near live electrical apparatus
UETTDRVC03A	Plan for the removal of vegetation up to vegetation exclusion zone near live electrical apparatus
UETTDRVC04A	Assess vegetation and recommend control measures for work near live electrical apparatus
UETTDRVC05A	Cut vegetation above ground level outside vegetation exclusion zone near live electrical apparatus
UETTDRVC06A	Cut vegetation at ground level outside vegetation exclusion zone near live electrical apparatus
UETTDRVC07A	Monitor safety compliance for vegetation work near live electrical apparatus
UETTDRVC08A	Safe use of EWP near live electrical apparatus
UETTDRVC09A	Control vegetation (Linework)
UETTDRVC10A	Coordinate vegetation control work

2.1.13 Imported CSUs

The following have been grouped into the Discipline of Imported units. They can be found in Qualifications within this Training Package across a number of AQF levels. Reference should be made to the Qualification Structure of Volume 1 Part 1 Qualification Framework to determine the relevant unit(s) pertaining to the qualification(s) required. The units grouped into this Discipline use their own unit code and are placed into two areas. Those that are utilised in the Core and those that are available as Electives units in any of the qualifications pertaining to this Training Package.

Every effort has been made to supply the latest imported unit but it is the responsibility of the user to utilise the most up-to-date version of the unit(s) required. It is highly advisable that imported unit are periodically checked with the National Training Information Service (NTIS) via the following link: <http://www.ntis.gov.au>

Imported units used as in the qualifications as Cores units are supplied in this Training Package in their entirety.

The Imported Units used in the Core are as follows:

UNIT CODE	UNIT TITLE
UEENEED002B	Assemble, set-up and test personnel computers
UEENEED004B	Use engineering application software
UEENEEE001B	Apply OHS practices in the workplace
UEENEEE002B	Dismantle, assemble and fabricate electrotechnology components
UEENEEE003B	Solve problems in extra-low voltage, single path circuits
UEENEEE004B	Solve problems in multiple path DC circuits
UEENEEE005B	Fix and secure equipment
UEENEEE007B	Use drawings, diagrams, schedules and manuals
UEENEEE024B	Compile and produce an electrotechnology report
UEENEEG001B	Solve problems in electromagnetic circuits
UEENEEG002B	Solve problems in single and three phase low voltage circuits
UEENEEG047B	Provide computational solutions to power engineering problems
UEENEEG048B	Solve problems in complex multiple path power circuits
UEENEEG049B	Solve problems in complex polyphase power circuits

UNIT CODE	UNIT TITLE
UEENEEH002B	Carry out basic repairs to electronic apparatus by replacement of components
UEENEEH011B	Troubleshoot d.c. power supplies with single phase input

Imported units used available in the qualifications as Elective units are supplied in this Training Package in a reduced format.

The Imported Units available as Elective Units are as follows:

UNIT CODE	UNIT TITLE
BSBFLM303B	Contribute to effective workplace relationships
BSBFLM305B	Support operational plan
BSBFLM306B	Provide workplace information and resourcing plans
BSBFLM309B	Support continuous improvement systems and processes
BSBFLM311B	Support a workplace learning environment
BSBFLM312A	Contribute to team effectiveness
BSBFLM403B	Manage effective workplace relationships
BSBFLM405B	Implement operational plan
BSBFLM406B	Implement workplace information system
BSBFLM409B	Implement continuous improvement
BSBFLM412A	Promote team effectiveness
BSBFLM501B	Manage personal work priorities and professional development
BSBFLM503B	Manage effective workplace relationships
BSBFLM505B	Manage operational plan
BSBFLM506B	Manage workplace information systems
BSBFLM507A	Manage quality customer service
BSBFLM509B	Facilitate continuous improvement
BSBFLM510B	Facilitate and capitalise on change and innovation

UNIT CODE	UNIT TITLE
BSBFLM511B	Develop a workplace learning environment
BSBFLM512B	Ensure team effectiveness
BSBFLM513A	Manage finances
BSBFLM514A	Manage people
BSBMGT507A	Manage environmental performance
ICTTC013C	Perform accurate cable system test
ICTTC064C	Haul underground cable
ICTTC065C	Splice optic fibre cable
ICTTC066C	Joint and terminate co-axial cable
ICTTC068C	Install telecommunications service to a building
ICTTC069C	Install network cable equipment
ICTTC104C	Maintain an electronic system
ICTTC127C	Supervise work site activities
ICTTC131B	Install an above ground equipment enclosure
ICTTC133B	Construct underground enclosures
ICTTC134B	Fix aerial cable
ICTTC135B	Joint metallic cable
UEENEEH012B	Troubleshoot digital subsystems
UEENEEH039B	Troubleshoot basic amplifiers
UEENEED017B	Install and configure internetworking systems
UEENEED027B	Develop structured programs to control external devices
UEENEED028B	Develop and test code for microcontroller devices
UEENEEE008B	Lay wiring and terminate accessories for extra-low voltage circuits

2.1.14 Possible Skills Sets CSUs

The following Competency Standard Units may appear within a qualification in this Training Package. However they may be independent or ‘orphaned’ from qualifications in this Package in which case they can be delivered and assessed independently of any qualification.

Typically, they CSUs relate to work functions that are associated with regulatory or specialised functions. They may augment or be incidental to existing competencies held by individuals, or be required for workplace entry associated with OHS issues. All pre-requisite requirements must be met for each Competency Standard Unit.

The Competency Standard Units listed below are not physically included in this section. For a physical copy of the Competency Standard Units refer to the respective Discipline section.

UNIT CODE	UNIT TITLE
UETTDREL03A	Comply with environmental and incidence response procedures
UETTDREL04A	Working safely near live electrical apparatus as non electrical worker
UETTDREL05A	Respond to technical enquiries and requests

2.2.1 Essential Knowledge and Associated Skills

Essential Knowledge and Associated Skills (EKAS) play an integral part in each unit of competency and must be taken into account when developing learning strategies and assessment tools. In determining strategies for delivery regard is to be given to the preferred use of industry EKAS learning specifications to assure consistency and reliability of outcomes. The information supplied below has been recommended by industry in providing the underpinning support towards deeming a person competent in a Unit(s) of Competency.

Outline of Essential Knowledge and Associated Skills construction

As Essential Knowledge and Associated Skills can be common across some units the Electricity Supply Industry has adopted a layout of incorporating Clause Numbers and Clause Titles in each unit of competence under Section 6.1. The numbers and titles have been group into categories that best suit the industry and training providers. The letter “T” depicted in the Clause Number has been allocated for this Training Package, the number 2 aligns to this section of Volume 2 of the Training Package and the centre number of the clause refers to the category as shown in the table below. The categories are as follows:

Category	Clause identification number
Engineering Applications	T2.1. n
Power Systems	T2.2. n
Powerline Safety and Protection	T2.3. n
Switching	T2.4. n
Vegetation	T2.5. n
Rail Traction	T2.6. n
Environmental Issues Powerline	T2.7. n
Enterprise Specific	T2.8. n
Drafting and Drawing	T2.9. n
Substations	T2.10. n
Advanced Power Systems	T2.11. n
Electrotechnology	E

Clauses and contents specific to the electrotechnology area have been allocated with the letter “E”. Note that the EKAS Clauses within the Electrotechnology competency standard units are assumed to contain the prefix letter “E”.

Essential Knowledge and Associated Skills clauses follow this section.

2.2.2 Essential Knowledge and Associated Skills to Unit Matrix Map

EKAS Clauses to unit map within CII in ESI Vegetation Control

EK&S Clauses to unit map within CII in ESI Vegetation Control

Clause Number	Clause Titles Located in Units within CII in ESI Vegetation Control	E001	EL03	EL04	VC01	VC02	VC03	VC04	VC05	VC06	VC07	VC08
E2.8.1.1	Basic electrical principles											
E2.8.5	Magnetism											
E2.8.8	Electrotechnology science and materials											
E2.11.1	Hand tools											
E2.11.2.1	Power tools											
E2.18.1	Occupational Health and Safety principles											
E2.18.2	Electrical safe working practices											
T2.1.3	Engineering applications of material properties.											
T2.1.5	Elevating work platform operational principles.											
T2.1.7	Enterprise vehicles											
T2.1.8	Chain saw principles											
T2.2.1	Generation power systems											
T2.2.2	Transmission, distribution and rail power systems											
T2.3.1	Powerline safety practices.											
T2.5.3	Fundamentals for working safely near live electrical apparatus											
T2.5.5	Powerline clearances and approach distances											
T2.5.6	Hazard assessment and risk management											
T2.5.7	Pruning principles near powerline											
T2.5.8	Establishing rigging requirements for vegetation control											
T2.5.9	Powerline access and isolation procedures											
T2.5.10	Tree preservation principles											
T2.5.12	Assessment of vegetation principles											
T2.5.13	Chemical control of foliage											
T2.5.14	Safety observer principles											
T2.5.15	Operating tools and equipment from a platform											
T2.5.16	Climbing techniques											
T2.5.17	Emergency procedures for climbers											
T2.7.1	Environmental fundamentals											
T2.7.2	Material handling and the environment											
T2.8.1	Enterprises specific - policies and procedure instructions											
T2.8.2	Enterprise specific - OHS instructions											
T2.8.12	Enterprise Specific - Vegetation control equipment											

EKAS Clause to Unit Map for Units within CII qualification – Transmission Line Assembly

Clause Number	Clause Titles Located in Units within CII	E001	EL03	TP02	TP03	TP04	TP05
E2.8.1.1	Basic electrical principles						
E2.11.1	Hand tools						
E2.11.2.1	Power tools						
E2.18.1	Occupational Health and Safety principles						
E2.18.2	Electrical safe working practices						
T2.1.3	Engineering applications of material						
T2.1.7	Enterprise vehicles						
T2.1.8	Chain saw principles						
T2.2.1	Generation power systems						
T2.2.2	Transmission, Distribution and Rail power systems						
T2.2.10	Transmission structures and hardware						
T2.2.32	Stringing transmission overhead conductors and cables						
T2.3.1	Powerline safety practices.						
T2.7.1	Environmental fundamentals						
T2.7.2	Material handling and the environment						
T2.8.1	Enterprises specific - policies and procedure instructions						
T2.8.2	Enterprise specific - OHS instructions						
T2.8.3	Enterprise specific - technical drawing and documents						

EKAS Clause to Unit Map for CIV ESI Power Systems

Clause No	Clause Titles Located in Units within CIV in ESI - Power Systems	CJ09A	CJ10A	CJ11A	CJ12A	DP03A	DP04A	DS01A	DS02A	DS03A	DS04A	IS08A	IS09A	IS10A	IS11A	IS22A	IS23A	IS24A	IS25A	RT11A	RT12A	RT13A	TP11A	TP12A	TP13A	VC10A	
E2.18.1	Occupational health and safety principles																										
E2.18.2	Electrical safe working practice																										
T2.1.4	Basic rigging techniques																										
T2.1.10	Filtering and sampling of insulating oil																										
T2.1.11	Testing of insulating oil																										
T2.2.4	Powerline distribution installation.																										
T2.2.5	Powerline installation safety.																										
T2.2.6	Pole and hardware installation.																										
T2.2.7	Low voltage electrical service installation.																										
T2.2.12	Underground cable installation																										
T2.2.13	Low voltage - energised working practices for Substations																										
T2.2.21	Installation and maintenance on transmission lines and associated equipment																										
T2.2.22	Installation and maintenance of public lighting and associated equipment																										
T2.2.23	Underground cable construction																										
T2.2.31	Distribution overhead line component fundamentals																										
T2.2.33	Installation of a mobile generator – HV																										
T2.2.34	Generator control systems - HV.																										
T2.2.35	Live line working up to 132kV with Hotstick																										
T2.2.36	Live line work for voltages greater than 132kV and up to 500kV with Hotstick																										
T2.2.37	Live line working up to 33kV with Glove & Barrier																										
T2.2.38	Working on live lines up to 33kV with Glove & Barrier/Hotstick Combined																										
T2.2.39	Plant, equipment and tools used for HV Live Line work																										
T2.2.40	Jointing and terminating oil & gas filled specialised underground cables																										
T2.2.41	Polymeric specialised underground cable principles																										
T2.2.42	Jointing and terminating specialised polymeric underground cables																										
T2.2.43	Installing oil & gas filled specialised underground cables																										
T2.2.44	Installing and maintaining polymeric specialised underground cables																										
T2.2.45	Maintaining oil & gas filled specialised underground cables																										
T2.2.46	Install & maintain oil & gas pressurised systems																										
T2.2.47	Oil & gas filled specialised underground cable principles.																										
T2.2.48	Electrical equipment - HV & LV powerline																										
T2.2.49	Co-ordinating permit access authority procedures.																										
T2.2.50	Extra High Voltage - Bare hand live line principles																										
T2.2.51	Extra High Voltage - Bare hand live line procedures																										
T2.2.52	Extra High Voltage - Bare hand live line work using a helicopter																										
T2.2.53	HV principles																										
T2.3.1	Powerline Safety Practices.																										
T2.3.2	Powerline safety - implementation and monitoring																										
T2.3.3	Statutory and safety considerations																										
T2.3.4	Electrical equipment - protection and control schemes																										
T2.3.5	Discrete protection schemes - Isolation and tagging procedures																										
T2.3.6	Protection devices - Maintenance and commissioning principles																										
T2.3.7	Protection devices - Manufacturers requirements																										
T2.4.1	Switchgear installation																										
T2.4.2	Low voltage switching principles																										
T2.4.3	High voltage switching principles																										
T2.4.4	High voltage fault switching principles																										
T2.4.5	High voltage distribution transformer principles																										
T2.4.6	High voltage SWER system																										
T2.4.7	Feeder automation system																										
T2.4.8	System switching operations and authorisation procedures - HV																										
T2.4.9	System switching operations and authorisation procedures - LV																										
T2.4.10	Co-ordinating and directing switching instructions																										
T2.4.11	High voltage overhead and substation switching principles																										
T2.4.12	Low voltage overhead and substation switching principles																										
T2.4.13	High voltage switching instruction preparation																										
T2.4.14	Low voltage switching instruction preparation																										
T2.5.1	Ecological principles for vegetation control																										
T2.5.2	Vegetation control techniques																										
T2.5.3	Fundamentals for working safely near live electrical apparatus																										
T2.5.4	Coordinate vegetation control inspection programs																										
T2.6.8	DC Traction - energised working practices																										
T2.6.9	Traction live line work																										
T2.7.1	Environmental fundamentals																										
T2.7.4	Powerline environmental impact - Implementation and monitoring																										
T2.7.5	Powerline sustainable energy management – Implementation and monitoring																										
T2.8.1	Enterprises specific - policies and procedure instructions																										
T2.8.2	Enterprise specific - OHS instructions																										
T2.8.3	Enterprise specific - Technical drawing and documents																										
T2.8.4	Enterprise specific – Switching diagrams																										
T2.8.5	Enterprise specific - Sustainable energy principles																										
T2.8.6	Enterprise specific - Specialised tools																										
T2.8.9	Enterprise Specific - Team work high voltage live line																										
T2.9.1	Interpretation of power distribution network drawings and documentation																										
T2.9.2	Overhead distribution extension layout principles																										
T2.9.3	Surveying techniques																										
T2.9.4	Introduction to computer software (powerline) and CAD																										
T2.9.5	Principles of lighting design																										
T2.9.6	Underground mains layout principles																										
T2.9.7	Distribution substation minor upgrade layout principles																										
T2.9.8	Principles in drafting street lighting system																										

EKAS Clause to Unit Map for CIV ESI Substations

Clause No	Clause Titles Located in Units within CIV in ESI - Substations	IS05A	IS07A	IS22A	IS23A	SB01A	SB02A	SB03A	SB04A	SB05A	SB06A	SB07A	SB09A	SB10A	SB11A	SB12A	SB13A	SB14A	SB15A	SB16A	SB17A	SB18A
E2.18.1	Occupational health and safety principles																					
E2.18.2	Electrical safe working practice																					
T2.1.10	Filtering and sampling of insulating oil																					
T2.1.11	Testing of insulating oil																					
T2.2.5	Powerline installation safety.																					
T2.2.13	Low voltage - energised working practices for Substations																					
T2.3.1	Powerline Safety Practices.																					
T2.3.2	Powerline safety - implementation and monitoring																					
T2.3.3	Statutory and safety considerations																					
T2.3.4	Electrical equipment - protection and control schemes																					
T2.3.5	Discrete protection schemes - Isolation and tagging procedures																					
T2.3.6	Protection devices - Maintenance and commissioning principles																					
T2.3.7	Protection devices - Manufacturers requirements																					
T2.4.1	Switchgear installation																					
T2.4.2	Low voltage switching principles																					
T2.4.3	High voltage switching principles																					
T2.4.4	High voltage fault switching principles																					
T2.4.5	High voltage distribution transformer principles																					
T2.4.6	High voltage SWER system																					
T2.4.7	Feeder automation system																					
T2.4.11	High voltage overhead and substation switching principles																					
T2.7.1	Environmental fundamentals																					
T2.7.2	Material handling and the environment																					
T2.7.3	Filtering and Sampling oil and the environment																					
T2.7.4	Powerline environmental impact - Implementation and monitoring																					
T2.7.5	Powerline sustainable energy management – Implementation and monitoring																					
T2.7.6	Disposal procedures for insulating materials.																					
T2.8.1	Enterprises specific - policies and procedure instructions																					
T2.8.2	Enterprise specific - OHS instructions																					
T2.8.3	Enterprise specific - Technical drawing and documents																					
T2.8.4	Enterprise specific – Switching diagrams																					
T2.8.6	Enterprise specific - Specialised tools																					
T2.8.7	Enterprise specific - Equipment installation procedures																					
T2.8.8	Enterprise specific - Data management processes																					
T2.10.1	Visual inspection procedures - Substations																					
T2.10.2	Surge relay operation and maintenance - Substations																					
T2.10.3	Commissioning of discrete protection devices- Substations																					
T2.10.4	Substation DC Circuit Breaker Principles																					
T2.10.5	Substation DC Circuit Breaker Maintenance																					
T2.10.6	Substation DC Circuit Breaker Installation																					
T2.10.7	Substation tools and equipment																					
T2.10.8	Typical fault conditions and symptoms - Substations																					
T2.10.9	Analyse and interpret results and measurements - Substations																					
T2.10.10	Equipment components and materials - Substations																					
T2.10.11	Substation Safety Practices																					
T2.10.12	Substation LV supply design principles																					
T2.10.13	Substation Control Systems design principles																					
T2.10.14	Hydraulic and pneumatic operating mechanism principles - Substations																					
T2.10.15	High Voltage Insulation system principles - Substations																					
T2.10.16	Power Transformers and Reactor principles - Substations																					
T2.10.17	Static reactive plant principles - Substations																					
T2.10.18	On Load Tapchanger principles - Substations																					
T2.10.19	Substation Switching Practices.																					
T2.10.20	Low voltage substation switching principles																					
T2.10.21	Circuit Breaker Construction Principles - Substations																					
T2.10.22	Circuit Breaker Operating Principles - Substations																					
T2.10.23	Infrared Imaging Principles - Substations																					
T2.10.24	Rotating reactive plant Principles - Substations																					
T2.10.25	Commissioning of distribution protection and control systems - Substations																					
T2.10.26	Voltage regulation scheme principles - Substations																					
T2.10.27	Use of test equipment on a discrete protection scheme - Substations																					
T2.11.74	Discrete protection devices																					

EKAS Clause to Unit Map for CIV ESI Network Infrastructure

Clause No	Clause Titles Located in Units within CIV in ESI - Network Infrastructure	EE001A	EL01A	EL02A	EL04A	IS22A	IS23A	CJ13A	CJ14A	DP05A	IS06A	IS27A	RT14A	RT15A	TP14A	TP15A
E2.7.5.1	Electrical installations, testing and verification methods															
E2.8.1.1	Basic electrical principles															
E2.8.2.2	Alternating current principles - power															
E2.8.3	Power factor															
E2.8.4	Three phase circuits															
E2.8.5	Magnetism															
E2.8.6	Electromagnetic induction															
E2.8.7	Harmonic fundamentals															
E2.8.8	Electrical materials															
E2.11.1	Hand tools															
E2.11.2.1	Power tools															
E2.18.1	Occupational Health and Safety principles															
E2.18.2	Electrical Safe working practice															
T2.1.1.	Engineering applications of mathematical principles															
T2.1.2.	Engineering applications of mechanical principles															
T2.1.3	Engineering applications of material properties.															
T2.1.4.	Basic rigging techniques															
T2.1.5.	Elevator work platform operational principles.															
T2.1.6.	Hydraulic and pneumatic portable equipment															
T2.1.7	Enterprise vehicles															
T2.1.8	Chain saw principles															
T2.1.9.	Stores procedures															
T2.1.10	Filtering and sampling of insulating oil															
T2.2.1	Generation power systems															
T2.2.2	Transmission, distribution and rail power systems															
T2.2.3	Substations, power transformers and reactors fundamentals.															
T2.2.4	Powerline distribution installation.															
T2.2.5	Powerline installation safety.															
T2.2.6	Pole and hardware installation.															
T2.2.7	Low voltage electrical service installation.															
T2.2.8	Poles and structures inspection principles															
T2.2.9	Powerline inspection principles															
T2.2.10	Transmission structures and hardware															
T2.2.11	Routine maintenance on transmission structures															
T2.2.12	Underground cable installation															
T2.2.13	Low voltage - energised working practices.															
T2.2.16	Fundamentals of Jointing LV polymeric cable															
T2.2.17	LV polymeric underground cable jointing principles															
T2.2.18	HV polymeric underground cable jointing principles															
T2.2.21	Installation and maintenance on transmission lines and associated equipment															
T2.2.23	Underground cable construction															
T2.2.28	Towers and structures inspection principles															
T2.2.29	Transmission powerline inspection principles															
T2.2.30	Powerline transmission installation safety															
T2.3.1	Powerline safety practices.															
T2.3.2	Powerline safety - implementation and monitoring															
T2.4.1	Switchgear installation															
T2.4.2	Low voltage switching principles															
T2.5.3	Fundamentals for working safely near live electrical apps															
T2.6.1	Electrical traction principles															
T2.6.2	Electrical traction protection requirements															
T2.6.3	Electrical overhead wiring traction systems															
T2.6.7	Overhead traction equipment and components															
T2.7.1	Environmental Fundamentals															
T2.7.2	Material handling and the environment															
T2.7.3	Filtering and Sampling oil and the environment															
T2.7.1	Environmental fundamentals															
T2.7.4	Powerline environmental impact - Implementation and monitoring															
T2.7.5	Powerline sustainable energy management – Implementation and monitoring															
T2.8.1	Enterprise specific - policy and procedure instructions															
T2.8.2	Enterprise specific - OHS instructions															
T2.8.3	Enterprise specific - Technical drawings and documents															
T2.8.4	Enterprise specific – Switching diagrams															

EKAS Clause to Unit Map for Diploma and Advanced Diploma Power Systems CORE

EKAS Clause	Clause Title	D002	D004	E001	E002	E003	E004	E007	E024	G001	G002	G047	G048	G049	H002	H011	EL01	EL04	IS22	IS23
E2.1.8	Electronic cable and conductor terminations																			
E2.11.1	Hand tools																			
E2.11.11.1	Electronic soldering equipment and techniques																			
E2.11.2.1	Power tools																			
E2.11.4	Dismantling and assembling techniques																			
E2.11.7.1	Electronic testing and measuring devices and techniques																			
E2.18.9	Electronic Safe working practices																			
E2.2.1	Enterprise communication methods																			
E2.2.2	Enterprise work activities records																			
E2.2.20	Computer use basics																			
E2.2.21	Engineering analysis, decision making and reporting																			
E2.2.25	Research concepts																			
E2.2.33	Working in a team																			
E2.2.35	Data collection techniques																			
E2.2.36	Data analysis and presentation																			
E2.4.11	Personal computers, hardware structure																			
E2.4.12.1	Computer hardware sub-assemblies																			
E2.4.14	Personal computer operating systems, basics																			
E2.4.16	Personal computers, engineering applications software basic																			
E2.5.1.2	Drawings and diagrams																			
E2.8.1.1	Basic electrical principles																			
E2.8.1.2	Fundamental electrical principles																			
E2.8.11	Power engineering computations																			
E2.8.2.1	Direct current circuit principles																			
E2.8.2.2	Alternating current principles - power																			
E2.8.6	Electromagnetic principles																			
E2.8.9.2	Electrical power circuit analysis																			
E2.8.9.3	Polyphase power circuit analysis																			
E2.9.1.1	Electronic component basics																			
E2.9.12	Electronic fault finding																			
E2.9.63	Direct current power supplies																			
E2.18.1	Occupational Health and Safety principles																			
E2.18.2	Electrical safe working practice																			
E2.18.8.2	Occupational Health and Safety, enterprise responsibilities																			
E2.20.1	Sustainable energy principles																			
T2.2.1	Generation power systems																			
T2.2.2	Transmission, distribution and rail power systems																			
T2.2.5	Powerline installation safety																			
T2.3.1	Powerline safety practices																			
T2.3.2	Powerline safety - implementation and monitoring																			
T2.5.3	Fundamentals for working safely near live electrical apparatus																			
T2.7.1	Environmental Fundamentals																			
T2.7.2	Material handling and the environment																			
T2.7.3	Filtering and sampling oil and the environment																			
T2.7.4	Powerline environmental impact - implementation and monitoring																			
T2.7.5	Powerline sustainable energy management – implementation and monitoring																			
T2.8.1	Enterprise specific - policy and procedure instructions																			
T2.8.2	Enterprise specific - OHS instructions																			
T2.8.3	Enterprise specific - technical drawings and documents																			
T2.8.4	Enterprise specific - sustainable energy principles																			

EKAS Clause to Unit Map for Diploma and Advanced Diploma ESI Power Systems DESIGN Part 1

Clause No	Clause Titles Located in Design Units within the Diploma and the Adv Dip of ESI - Power Systems	DS05	DS06	DS07	DS08	DS09	DS10	DS11	DS12	DS13	DS14	DS15	DS16	DS17	DS18	DS19	DS20	DS21	DS22	DS23	DS24	DS25	DS26	DS27	DS28	IS26	ED017	ED027	ED028	EH017	EH039
E2.11.7.1	Electronic testing and measuring devices and techniques																														
E2.18.1	Occupational health and safety principles																														
E2.18.2	Electrical safe working practice																														
E2.18.8.2	Occupational health and safety - enterprise responsibilities																														
E2.18.9	Electronic Safe working practices																														
E2.18.9	Electronic Safe working practices																														
E2.3.19	Control programming fundamentals																														
E2.3.20	Microcontroller programming basics																														
E2.4.3.2	Networking fundamentals																														
E2.4.39	Internet, network basics																														
E2.4.40	Internet, network routing																														
E2.5.1.2	Drawings and diagrams																														
E2.5.10	Technical manuals and catalogues																														
E2.8.11	Power engineering computation																														
E2.8.9.2	Electronic power circuit analysis																														
E2.8.9.3	Polyphase power circuit analysis																														
E2.8.10.1	Engineering maths fundamentals																														
E2.8.10.2	Engineering maths																														
E2.8.10.3	Advanced Engineering maths																														
E2.9.5.1	Microprocessor fundamentals																														
E2.9.5.2	Microcontroller fundamentals																														
E2.9.8	Amplifier Fundamentals																														
E2.9.12	Electronic fault finding																														
E2.9.19	Audio/video recording and replay components repair basics																														
E2.9.27	Digital versatile disc (DVD) and compact disc (CD)																														
E2.9.48	Digital audio																														
E2.9.52	Digital versatile disk processors																														
E2.9.53	Compact disk players																														
T2.1.1	Engineering applications of mathematical principles																														
T2.1.2	Engineering applications of mechanical principles																														
T2.1.3	Engineering applications of material properties.																														
T2.10.1	Visual inspection procedures - Substations																														
T2.10.11	Substation Safety Practices																														
T2.10.12	Substation LV supply design principles																														
T2.10.13	Substation Control Systems design principles																														
T2.10.15	High Voltage Insulation system principles - Substations																														
T2.10.16	Power Transformers and Reactor principles - Substations																														
T2.10.17	Static reactive plant principles - Substations																														
T2.10.18	On Load Tapchanger principles - Substations																														
T2.10.19	Substation Switching Practices.																														
T2.10.21	Circuit Breaker Construction Principles - Substations																														
T2.10.24	Rotating reactive plant Principles - Substations																														
T2.10.25	Commissioning of distribution protection and control systems - Substations																														
T2.10.26	Voltage regulation scheme principles - Substations																														
T2.10.27	Use of test equipment on a discrete protection scheme - Substations																														
T2.10.28	Electrical equipment - Distribution field device protection and control schemes - Substations																														
T2.10.3	Commissioning of discrete protection devices- Substations																														
T2.10.7	Substation tools and equipment																														
T2.11.1	Power System layouts																														
T2.11.11	Control of transient overvoltages																														
T2.11.12	Corona and discharge losses																														
T2.11.14	Fault calculation techniques																														
T2.11.16	Commissioning Procedures																														
T2.11.17	Protection scheme requirements																														
T2.11.18	Discrete protection systems																														
T2.11.19	Interdependant protection systems																														
T2.11.2	Circuit Breaker Auxilliary Systems																														
T2.11.20	Complex protection systems																														
T2.11.21	Financial impact statements																														
T2.11.22	Instrument transformers																														
T2.11.23	Locate and recify faults in electrical equipment																														
T2.11.24	Electrical equipment - Metering devices																														
T2.11.25	Communication Devices and Principles																														
T2.11.26	Test Equipment A – Fundamental																														
T2.11.27	Test Equipment B – Protection																														
T2.11.29	Test Equipment D – Control																														
T2.11.3	DC Transmission system principles																														
T2.11.30	Test Equipment E – Field																														
T2.11.31	Primary plant testing																														
T2.11.32	Quality of Supply Measures																														
T2.11.33	Geographic Information Systems Principles																														
T2.11.37	Negotiation techniques																														
T2.11.38	procedures																														
T2.11.39	Project Management																														
T2.11.4	AC Transmission system components																														
T2.11.40	Harmonics																														
T2.11.42	Basic design characteristics of poles/structures and associated equipment.																														
T2.11.44	Design characteristics of conductors and cables used on poles and or structures.																														
T2.11.46	Distribution transformers fundamentals																														
T2.11.47	Distribution transformers testing																														

EKAS Clause to Unit Map for Diploma and Advanced Diploma ESI Power Systems DESIGN Part 2

Clause No	Clause Titles Located in Design Units within the Diploma and the Adv Dip of ESI - Power Systems	DS05	DS06	DS07	DS08	DS09	DS10	DS11	DS12	DS13	DS14	DS15	DS16	DS17	DS18	DS19	DS20	DS21	DS22	DS23	DS24	DS25	DS26	DS27	DS28	IS26	ED017	ED027	ED028	EH017	EH039
T2.11.48	Power test equipment																														
T2.11.49	Circuit analysis)																														
T2.11.5	AC Transmisison line electrical parameters																														
T2.11.51	Distribution earthing system																														
T2.11.53	Protection schemes																														
T2.11.6	AC Transmission lines equivalent circuit calculations																														
T2.11.61	Analysis network event records																														
T2.11.62	Preparing polices and procedures																														
T2.11.65	HV System load calculation principles																														
T2.11.66	EHV System load calculation principles.																														
T2.11.67	Zone Substation modification design principles																														
T2.11.68	Substation Design Process Principles.																														
T2.11.69	Building design - Substations Principles																														
T2.11.7	Basic Design Characteristics of Transmission structures and associated equipment																														
T2.11.70	Primary plant design - Substations Principles																														
T2.11.71	Protection & control design - Substations Principles																														
T2.11.72	Earthing design - Substations Principles																														
T2.11.73	Civil & structural design - Substations Principles																														
T2.11.8	Voltage control devices on interconnected transmission systems																														
T2.11.9	Calculation of rating of voltage control devices.																														
T2.2.1	Generation power systems																														
T2.2.10	Transmission structures and hardware																														
T2.2.11	Routine maintenance on transmission structures																														
T2.2.12	Underground cable installation																														
T2.2.13	Low voltage - energised working practices for Substations																														
T2.2.15	Metering installations.																														
T2.2.2	Transmission, Distribution and Rail power systems																														
T2.2.21	equipment																														
T2.2.22	equipment																														
T2.2.23	Underground cable construction																														
T2.2.28	Towers and structures inspection principles																														
T2.2.29	Transmission powerline inspection principles																														
T2.2.3	Substations, power transformers and reactors.																														
T2.2.31	Distribution overhead line component fundamentals																														
T2.2.38	working on live lines up to 55kV with Grove & Barrier/Hotstick Combined																														
T2.2.39	Plant, equipment and tools used for HV Live Line work																														
T2.2.4	Powerline distribution installation.																														
T2.2.48	Electrical equipment - HV & LV powerline																														
T2.2.49	Co-ordinating permit access authority procedures.																														
T2.2.5	Powerline installation safety.																														
T2.2.53	HV principles																														
T2.2.6	Pole and hardware installation.																														
T2.2.7	Low voltage electrical service installation.																														
T2.3.1	Powerline Safety Practices.																														
T2.3.2	Powerline safety - implementation and monitoring																														
T2.3.2	Powerline safety - implementation and monitoring																														
T2.3.3	Statutory and safety considerations																														
T2.3.4	Electrical equipment - protection and control schemes																														
T2.3.8	Safe Design Principles																														
T2.4.1	Switchgear installation																														
T2.4.11	High voltage overhead and substation switching principles																														
T2.4.2	Low voltage switching principles																														
T2.4.3	High voltage switching principles																														
T2.4.4	High voltage fault switching principles																														
T2.4.5	High voltage distribution transformer principles																														
T2.4.6	High voltage SWER system																														
T2.4.7	Feeder automation system																														
T2.7.1	Environmental fundamentals																														
T2.7.2	Material handling and the environment																														
T2.7.4	Powerline environmental impact - Implementation and monitoring																														
T2.8.1	Enterprises specific - policies and procedure instructions																														
T2.8.1	Enterprise specific - policies and procedure instructions																														
T2.8.14	Enterprise specific - Procedures and work practices relating to critical events																														
T2.8.17	Enterprise specific - Effective management and communication of people.																														
T2.8.18	Enterprise specific - Writing management reports																														
T2.8.19	Enterprise specific - Procedures and work practices relating to managing critical events																														
T2.8.2	Enterprise specific - OHS instructions																														
T2.8.3	Enterprise specific - Technical drawing and documents																														
T2.8.4	Enterprise specific - Switching diagrams																														
T2.8.7	Enterprise specific - Equipment installation procedures																														
T2.8.8	Enterprise specific - Data management processes																														
T2.9.1	Interpretation of power distribution network drawings and documentation																														
T2.9.2	Overhead distribution extension layout principles																														
T2.9.3	Surveying techniques																														
T2.9.5	Principles of lighting design																														
T2.9.6	Underground mains layout principles																														
T2.9.7	Distribution substation minor upgrade layout principles																														
T2.9.8	Principles in drafting street lighting system																														

EKAS Clause to Unit Map for Diploma and Advanced Diploma ESI Power Systems TESTING

Clause No	Clause Titles Located in Testing Units within the Diploma and the Adv Dip of ESI - Power Systems	TS01	TS02	TS03	TS04	TS05	TS06	TS07	TS08	TS09	TS10	TS11	TS12	TS13	TS14	TS15	TS16	IS26	ED017	ED027	ED028	EH017	EH039
E2.3.19	Control programming fundamentals																						
E2.3.20	Microcontroller programming basics																						
E2.4.3.2	Networking fundamentals																						
E2.4.39	Internet, network basics																						
E2.4.40	Internet, network routing																						
E2.5.10	Technical manuals and catalogues																						
E2.9.5.1	Microprocessor fundamentals																						
E2.9.5.2	Microcontroller fundamentals																						
E2.9.8	Amplifier Fundamentals																						
E2.9.12	Electronic fault finding																						
E2.9.19	Audio/video recording and replay components repair basics																						
E2.9.27	Digital versatile disc (DVD) and compact disc (CD)																						
E2.9.48	Digital audio																						
E2.9.52	Digital versatile disk processors																						
E2.9.53	Compact disk players																						
E2.11.7.1	Electronic testing and measuring devices and techniques																						
E2.18.1	Occupational health and safety principles																						
E2.18.2	Electrical safe working practice																						
E2.18.8.2	Occupational health and safety - enterprise responsibilities																						
E2.18.9	Electronic Safe working practices																						
T2.10.1	Visual inspection procedures - Substations																						
T2.10.11	Substation Safety Practices																						
T2.10.15	High Voltage Insulation system principles - Substations																						
T2.10.16	Power Transformers and Reactor principles - Substations																						
T2.10.17	Static reactive plant principles - Substations																						
T2.10.18	On Load Tapchanger principles - Substations																						
T2.10.19	Substation Switching Practices.																						
T2.10.2	Surge relay operation and maintenance - Substations																						
T2.10.20	Low voltage substation switching principles																						
T2.10.21	Circuit Breaker Construction Principles - Substations																						
T2.10.23	Infrared imaging principles - substations																						
T2.10.24	Rotating reactive plant Principles - Substations																						
T2.10.25	Commissioning of distribution protection and control systems - substations																						
T2.10.26	Voltage regulation scheme principles - Substations																						
T2.10.27	Use of test equipment on a discrete protection scheme - Substations																						
T2.10.28	Electrical equipment-distribution field device protection & control schemes-Substations																						
T2.10.3	Commissioning of discrete protection devices- Substations																						
T2.10.9	Analyse and interpret results and measurements - Substations																						
T2.11.1	Power System layouts																						
T2.11.11	Control of transient overvoltages																						
T2.11.14	Fault calculation techniques																						
T2.11.15	Visual Inspection Procedures																						
T2.11.16	Commissioning Procedures																						
T2.11.17	Protection scheme requirements																						
T2.11.18	Discrete protection systems																						
T2.11.19	Interdependant protection systems																						
T2.11.2	Circuit breaker auxiliary systems																						
T2.11.20	Complex protection systems																						
T2.11.21	Financial impact statements																						
T2.11.22	Instrument transformers																						
T2.11.23	Locate and recify faults in electrical equipment																						
T2.11.24	Electrical equipment - Metering devices																						
T2.11.25	Communication Devices and Principles																						
T2.11.26	Test Equipment A – Fundamental																						
T2.11.27	Test Equipment B – Protection																						
T2.11.28	Test Equipment C – Metering																						
T2.11.30	Test Equipment E – Field																						
T2.11.31	Primary plant testing																						
T2.11.35	Secondary Switching/isolation principles and sheet preparation																						
T2.11.36	Disconnect and reconnect fixed wiring electrical equipment fundamentals																						
T2.11.37	Negotiation techniques																						
T2.11.38	Disconnect and reconnect fixed wiring electrical equipment principles																						
T2.11.39	Project Management																						
T2.11.40	Harmonics																						
T2.11.41	Fault-finding and diagnosing techniques.																						
T2.11.53	Protection schemes																						
T2.11.59	Generator control systems - EHV																						
T2.11.62	Preparing polices and procedures																						
T2.11.8	Voltage control devices on interconnected transmission systems																						
T2.11.9	Calculation of rating of voltage control devices.																						
T2.2.1	Generation power systems																						
T2.2.15	Metering installations																						
T2.2.2	Transmission, distribution and rail power systems																						
T2.2.3	Substations, distribution and rail power systems																						
T2.2.34	Generator control systems - HV																						
T2.2.48	Electrical equipment - HV and LV powerline																						
T2.2.49	Coordinating permit access authority procedures																						
T2.2.5	Powerline installation safety																						
T2.3.1	Powerline Safety Practices.																						
T2.3.2	Powerline safety - implementation and monitoring																						
T2.3.3	Statutory and safety considerations																						
T2.3.4	Electrical equipment - protection and control schemes																						
T2.3.5	Discrete protection schemes - Isolation and tagging procedures																						
T2.3.6	Protection devices - Maintenance and commissioning principles																						
T2.3.7	Protection devices - Manufacturers requirements																						
T2.4.8	System switching operations and authorisation procedures - HV																						
T2.4.9	System switching operations and authorisation procedures - LV																						
T2.7.6	Disposal procedures for insulating materials.																						
T2.8.1	Enterprise specific - policies and procedure instructions																						
T2.8.2	Enterprise specific - OHS instructions																						
T2.8.7	Enterprise specific - Equipment installation procedures																						
T2.9.1	Interpretation of power distribution network drawings and documentation																						

