Quality Council for Trades & Occupations
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SKILLS PROGRAMME
CURRICULUM DOCUMENT

IN LINE WITH THE OQSF POLICY (2021) OCCUPATIONAL QUALIFICATION TYPE (NOMENCLATURE)

SKILLS PROGRAMME	**SKILLS PROGRAMME ID**	**TITLE (DESCRIPTOR)**	**NQF LEVEL**	**CREDITS**
	SP-250820	Electrical Network Operations (Medium and High Voltage)	5	52
CURRICULUM CODE	900522-000-00-00			
PARTNER DETAILS	**ORGANISATION NAME**	**WEBSITE ADDRESS**	**TELEPHONE NUMBER**	**LOGO**
QUALITY PARTNER - DEVELOPMENT	The Energy & Water Sector Education Training Authority (EWSETA)	www.ewseta.org.za	011 274 4700	

Contents

SECTION 1: CURRICULUM SUMMARY

1.1 Occupational Information:

1.1.1 Associated, Organising Framework for Occupations (OFO) Occupational Code and Title

311302: Electric Substation Operations Manager

1.1.2 Skills Programme Type, Title, NQF Level, Credits and Curriculum Code, addressed by this Curriculum.

TYPE	TITLE	NQF LEVEL	CREDITS	CURRICULUM CODE
Skills Programme	Electrical Network Operations (Medium and High Voltage)	5	52	900522-000-00-00

1.1.3 Alternative titles used by industry:

Substation Operator

1.2 Curriculum Information:

1.2.1 Articulation for Skills programmes

(a) Work Opportunities:

Electrical Network Operator, Substation Operator, and Mini Sub Operator.

(b) Learning Opportunities:

Subject to satisfying their entry requirements, learners may enroll in other related skills programmes and or qualifications within the electrical engineering and related occupations.

1.3 Curriculum Structure:

1.3.1 Knowledge/Theory Modules:

900522-000-00-KM-01, Health, safety and risk assessment in high voltage areas, Level 5, Credits 7

900522-000-00-KM-02, Standard for supervision of people in electrically hazardous locations, Level 5, Credits 3

900522-000-00-KM-03, Network voltage operating principles, Level 5, Credits 13

900522-000-00-KM-04, Equipotential earthing, Level 5, Credits 3

Total number of credits: 26

1.3.2 Practical Skills Modules:

900522-000-00-PM-01, Monitor and record the performance of electrical network equipment, NQF Level 5, Credits 6

900522-000-00-PM-02: Prepare reports and make recommendations on actions to be taken, NQF Level 5, Credits 4

900522-000-00-PM-03, Conduct switching, isolating, testing and earthing, NQF Level 5, Credits 13

900522-000-00-PM-04: Conduct first line maintenance of electrical network equipment, NQF Level 5, Credits 3

Total number of credits: 26

1.4 Entry Requirements:

NQF Level 4 Electrical Engineering related qualification

Or

Electrical Engineering Trade Certificate

1.5 Recognition of Prior Learning (RPL):

1.5.1 RPL for Access:

Learners may use the RPL process to gain access to training opportunities for skills programme if they do not meet the formal, minimum entry requirements for admission. RPL assessment provides an alternative access route into a skills programme.

Such an RPL assessment may be developed, moderated and conducted by the accredited Skills Development Provider which offers that specific skills programme. Such an assessment must ensure that the learner is able to display the equivalent level of competencies required for access, based on the NQF level descriptors.

1.5.2 RPL for Exemption:

For exemption from modules through RPL, learners who have gained the stipulated competencies of the modules of a skills programme through any means of formal, informal or non-formal learning and/or work experience, may be awarded credits towards relevant modules, and gaps identified for training, which is then concluded.

1.5.3 RPL for awarding credits:

Learners who have gained the stipulated competencies of the modules of a skills programme through any means of formal, informal or non-formal learning and/or work experience, may be awarded credits towards relevant modules, and gaps identified for training, which is then concluded.

For a Skills Programme, the accredited Skills Development Provider (SDP) must ensure all modular competency requirements are met prior to the FISA and keep record of such evidence.

Upon successful completion of the FISA, RPL learners will be issued with the QCTO certificate for the skills programme. Quality Partners are responsible for ensuring the RPL mechanism and process for skills programme is approved by the QCTO.

1.6 Quality Partner for Assessment:

N/A

1.7 List of Qualification(s)/Part- Qualification(s)/Skills Programme(s) Related to this Curriculum

None.

SECTION 2: SKILLS PROGRAMME PROFILE

2.1 Purpose:

The purpose of the skills programme is to prepare a learner to operate as an Electrical Network Operator (Medium and High Voltage).

An Electrical Network Operator (Medium and High Voltage) conducts switching, isolating, testing and earthing of electrical equipment on an electrical network above 1 kV AC or 1,5 kV DC up to and including 765 kV to control the flow of electrical power through the grid as per NRS 040.

2.2 Tasks

TASK	LINKS TO ELO
Monitor and document the performance of electrical network equipment	Apply understanding of electrical network principles in monitoring the performance of electrical network equipment and recording of readings.
Conduct switching, isolating, testing, and earthing sequentially, as well as maintain and repair electrical network equipment	Perform sequential operations, maintenance, and repair on electrical network equipment applying industry principles and procedures.

2.3 Occupational Task Details

2.3.1 Task 1

Monitor and document the performance of electrical network equipment

(a) Unique Product or Service:

Record of network performance

(b) Responsibilities:

- Monitor and record the performance of electrical network equipment
- Prepare reports and make recommendations on actions to be taken

2.3.2 Task 2

Conduct switching, isolating, testing, and earthing sequentially, as well as maintain and repair electrical network equipment.

(a) Unique Product or Service:

Maintained and safe substation components

(b) Responsibilities:

- Conduct switching, isolating, testing and earthing
- Conduct first line maintenance of electrical network equipment

2.4 Skills Programme outline

The table below shows the relation between tasks, modules, exit level outcomes and associated assessment criteria.

<table>
<tr><td colspan="2">KM01, Health, safety and risk assessment in high voltage areas, Level 5, Credits 7
• Health, safety and quality in high voltage areas
• Pre-task planning and risk assessment</td><td></td></tr>
<tr><td colspan="2">KM02, Standard for supervision of people in electrically hazardous locations, Level 5, Credits 3
• Levels of supervision of people in electrical hazardous areas
• Authorisation and responsibilities of supervision
• Scenarios leading to close proximity and criteria for level of supervision
• Conditions of direct supervision and supervision techniques</td><td></td></tr>
<tr><td rowspan="6">KM03, Network voltage operating principles, Level 5, Credits 13
• Operating regulations
• Basic power system protection
• Operating of medium and high voltage networks and phasing theory

KM04, Equipotential earthing, Level 5, Credits 3
• Equipotential earthing</td><td>Task 1: Monitor and document the performance of electrical network equipment
ELO 1: Apply understanding of electrical network principles in monitoring the performance of electrical network equipment and recording of readings.</td></tr>
<tr><td>PM01, Monitor and record the performance of electrical network equipment, NQF Level 5, Credits 6
• Monitor and record performance of transformers and transformer protection systems
• Monitor and record performance of batteries and battery chargers
• Monitor and record performance of switchgear and all other apparatus</td></tr>
<tr><td>PM02: Prepare reports and make recommendations on actions to be taken, NQF Level 5, Credits 4
• Prepare relevant data for operational reports</td></tr>
<tr><td>Task 2: Conduct switching, isolating, testing, and earthing sequentially, as well as maintain and repair electrical network equipment
ELO 2: Perform sequential operations, maintenance, and repair on electrical network equipment applying industry principles and procedures.</td></tr>
<tr><td>PM03, Conduct switching, isolating, testing and earthing, NQF Level 5, Credits 13
• Select personal protective clothing
• Conduct switching on a feeder panel
• Isolate supply to apparatus
• Perform testing
• Perform earthing</td></tr>
<tr><td>PM05: Conduct first line maintenance of electrical network equipment, NQF Level 5, Credits 3
• Conduct inspections of the equipotential earthing system
• Conduct earth resistance and continuity testing of the earthing system</td></tr>
</table>

Associated assessment criteria ELO 1

- Transformers, transformer protection systems, and relay settings and flags are inspected, readings correctly recorded, whilst adhering to procedures and safety requirements.
- Oil levels of main tank, tap changer and conservator tank are inspected, readings correctly recorded, whilst adhering to procedures and safety requirements.
- Batteries and battery chargers are inspected, readings correctly recorded, whilst adhering to procedures and safety requirements

Associated assessment criteria ELO 2

- Safety procedures in terms of prohibitory notice and personal protective clothing (PPC) relevant to the ARC burn rating are correctly applied.
- Performance of switching, isolating, testing and earthing to take equipment out of service are conducted sequentially and in accordance with the instruction sheet.
- Performance of removing earthing, isolating and switching to put equipment back into service are conducted sequentially and in accordance with the instruction sheet.

SECTION 3: CURRICULUM COMPONENT SPECIFICATIONS

3 Knowledge Module Specifications:

MODULE CODE	MODULE TITLE	NQF LEVEL	CREDITS	MODE OF DELIVERY
900522-000-00-KM-01	Health, safety and risk assessment in high voltage areas	5	7	Blended
900522-000-00-KM-02	for supervision of people in electrically hazardous locations	5	3	Blended
900522-000-00-KM-03	Network voltage operating principles	5	13	Blended
900522-000-00-KM-04	Equipotential earthing, Level 5, Credits 3	5	3	Blended

Detailing Knowledge Module (KM) contents

3.1 900522-000-00-KM-01, Health, safety and risk assessment in high voltage areas, Level 5, Credits 7

MODULE CODE	MODULE TITLE	NQF LEVEL	CREDITS	MODE OF DELIVERY
900522-000-00-KM-01	Health, safety and risk assessment in high voltage areas	5	7	Blended

3.1.1 Module Details:

(a) Purpose of Knowledge Module:

The focus of the learning in this knowledge module is to build a basic understanding of the perform the pre-task planning and risk assessment to ensure health and safety in the workplace

The learning will enable learners to demonstrate an understanding of the topics listed below:

(b) List of Knowledge Topics:

TOPIC CODE	TOPIC TITLE	% OF TIME TO BE SPENT
KM-01-KT01	Health, safety and quality in high voltage areas	50
KM-01-KT02	Pre-task planning and risk assessment	50

(c) Detailing each topic listed above into topic elements:

KM-01-KT01 Health, safety and quality in high voltage areas 50%		
TOPIC ELEMENT CODE	**TOPIC ELEMENT TITLE**	**% OF TIME TO BE SPENT**
KT0101	Health, safety and quality at the workplace	25
KT0102	Arc and burn protection	65
KT0103	Operating in the high voltage environment and regulations awareness	10

(d) Internal Assessment Criteria (IAC) and Weight

IAC CODE	IAC DESCRIPTION	% OF TIME TO BE SPENT
IAC0101	Discuss the impact and importance of the Occupational Health and Safety Act 85 of 1993 and related Regulations on work being performed in high voltage areas	10

IAC0102	Discuss employees' right of refusal to work in an unsafe situation procedure	15
IAC0103	Discuss the speed and intensity of an arc blast	20
IAC0104	Discuss the arc radius and categories	20
IAC0105	Discuss SANS 724:2010 in terms of arc rated clothing and the clothing required when working at different ratings	25
IAC0106	Discuss the impact and importance of the Operating Regulations for High Voltage Systems	10

(c) Detailing each topic listed above into topic elements:

KM-01-KT02 Pre-task planning and risk assessment 50%		
TOPIC ELEMENT CODE	**TOPIC ELEMENT TITLE**	**% OF TIME TO BE SPENT**
KT0201	Pre task panning	40
KT0202	Risk assessment	60

(d) Internal Assessment Criteria (IAC) and Weight

IAC CODE	IAC DESCRIPTION	% OF TIME TO BE SPENT
IAC0201	Discuss pre-task planning for planned and unplanned work.	20
IAC0202	Define pre-task planning and risk assessment terminology.	20
IAC0203	Discuss the factors that influence risk assessments as well as the objective of doing risk assessments.	15
IAC0204	Differentiate between the different types of risk assessments.	15
IAC0205	Identify and discuss different types of hazards.	15
IAC0206	Discuss and explain the steps of the pre-task risk assessment process	15

3.1.2 Criteria for accreditation

Physical Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
EQUIPMENT & TOOLS	• Physical training facilities (or if using a hybrid or e-learning model – software or internet platform) conducive to hosting the number of learners comfortably and safely for the duration of this module.

	• Facilities that meet the minimum requirements for the comfort of learners (ablutions, hand washing facilities, sheltered from the elements etc.) if relevant. • All learning materials, lesson plans, workbooks, assessment guides to cover the related topics. • All learning materials, lesson plans, workbooks, assessment guides to cover the related topics. • Internal summative assessment instruments (if not online).
CONSUMABLES	• None

Human Resource Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
QUALIFICATIONS & EXPERIENCE	Qualification of lecturer/facilitator (SME): • Qualified as an Electrician or Electrical line Mechanic. • Have been authorised up to 132 kV with 5 years' experience practicing as an authorised operator. • Must be a registered assessor and moderator.
FACILITATOR/LEARNER RATIO	1: maximum 20

Legal Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
	• CIPC registered entity. • SARS Tax compliance • Compliant and current health and safety audit report. • Relevant labour legislation visible in facility or on platform (as required by current legislation). • POPIA compliant.

Additional Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)
• None.

3.1.3 Exemptions

None

3.2 900522-000-00-KM-02, Standard for supervision of people in electrically hazardous locations, NQF Level 5, Credits 3

MODULE CODE	MODULE TITLE	NQF LEVEL	CREDITS	MODE OF DELIVERY
900522-000-00-KM-02	Standard for supervision of people in electrically hazardous locations	5	3	Blended

3.2.1 Module Details:

(a) Purpose of Knowledge Module:

The focus of the learning in this knowledge module is to build a basic understanding of the standard for supervision of people in electrically hazardous locations including levels, responsibilities, scenarios leading to close proximity, conditions and techniques.

The learning will enable learners to demonstrate an understanding of the topics listed below.

(b) List of Knowledge Topics:

TOPIC CODE	TOPIC TITLE	% OF TIME TO BE SPENT
KM-02-KT01	Levels of supervision of people in electrical hazardous areas	25
KM-02-KT02	Authorisation and responsibilities of supervision	25
KM-02-KT03	Scenarios leading to close proximity and criteria for level of supervision	25
KM-02-KT04	Conditions of direct supervision and supervision techniques	25

(c) Detailing each topic listed above into topic elements:

KM-02-KT01: Levels of supervision of people in electrical hazardous areas 25%		
TOPIC ELEMENT CODE	**TOPIC ELEMENT TITLE**	**% OF TIME TO BE SPENT**
KT0101	General supervision	25
KT0102	Indirect supervision	25
KT0103	Direct supervision	25
KT0104	Direct supervision with physical control	25

(d) Internal Assessment Criteria (IAC) and Weight

IAC CODE	IAC DESCRIPTION	% OF TIME TO BE SPENT
IAC0101	Define general supervision and describe associated conditions and responsibilities	25
IAC0102	Define indirect supervision and describe associated conditions and responsibilities	25
IAC0103	Define direct supervision and describe associated conditions and responsibilities	25
IAC0104	Define direct supervision with physical control and describe associated conditions and responsibilities	25

(c) Detailing each topic listed above into topic elements:

KM-02-KT02: Authorisation and responsibilities of supervision 25%		
TOPIC ELEMENT CODE	**TOPIC ELEMENT TITLE**	**% OF TIME TO BE SPENT**
KT0201	Authorisation of staff to conduct supervision	30
KT0202	Responsibilities of the person performing supervision	70

(3) Internal Assessment Criteria (IAC) and Weight

IAC CODE	IAC DESCRIPTION	% OF TIME TO BE SPENT
IAC0201	Discuss the scenarios related to authorisation of staff to conduct supervision	30
IAC0202	Discuss the responsibilities of the person performing supervision	70

KM-02-KT03: Scenarios leading to close proximity and criteria for level of supervision 25%		
TOPIC ELEMENT CODE	**TOPIC ELEMENT TITLE**	**% OF TIME TO BE SPENT**
KT0301	Scenarios that may lead to close proximity situations	50
KT0302	Criteria for the selection of the appropriate level of supervision	50

Internal Assessment Criteria (IAC) and Weight

IAC CODE	IAC DESCRIPTION	% OF TIME TO BE SPENT
IAC0301	Discuss the consequences of scenarios that may lead to close proximity situations	50

IAC0302	Discuss the criteria for the selection of the appropriate level of supervision	50

(c) Detailing each topic listed above into topic elements:

KM-02-KT04: Conditions of direct supervision and supervision techniques 25%		
TOPIC ELEMENT CODE	**TOPIC ELEMENT TITLE**	**% OF TIME TO BE SPENT**
KT0401	Conditions under which direct supervision work shall be stopped	50
KT0402	Supervision techniques	50

(d) Internal Assessment Criteria (IAC) and Weight

IAC CODE	**IAC DESCRIPTION**	**% OF TIME TO BE SPENT**
IAC0401	Discuss the conditions under which direct supervision work shall be stopped	50
IAC0402	Discuss different supervision techniques	50

3.2.2 Criteria for accreditation

Physical Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
EQUIPMENT & TOOLS	• Physical training facilities (or if using a hybrid or e-learning model – software or internet platform) conducive to hosting the number of learners comfortably and safely for the duration of this module. • Facilities that meet the minimum requirements for the comfort of learners (ablutions, hand washing facilities, sheltered from the elements etc.) if relevant. • All learning materials, lesson plans, workbooks, assessment guides to cover the related topics. • All learning materials, lesson plans, workbooks, assessment guides to cover the related topics. • Internal summative assessment instruments (if not online).
CONSUMABLES	• None

Human Resource Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
QUALIFICATIONS & EXPERIENCE	Qualification of lecturer/facilitator (SME): • Qualified as an Electrician or Electrical line Mechanic. • Have been authorised up to 132 kV with 5 years' experience practicing as an authorised operator. • Must be a registered assessor and moderator.
FACILITATOR/LEARNER RATIO	1: maximum 20

Legal Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
	• CIPC registered entity. • SARS Tax compliance • Compliant and current health and safety audit report. • Relevant labour legislation visible in facility or on platform (as required by current legislation). • POPIA compliant.

Additional Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)
• None.

3.2.3 Exemptions

None

3. 3 900522-000-00-KM-03, Network voltage operating principles, NQF Level 5, Credits 13

MODULE CODE	MODULE TITLE	NQF LEVEL	CREDITS	MODE OF DELIVERY
900522-000-00-KM-03	Network voltage operating principles	5	13	Blended

3.1.1 Module Details:

(a) Purpose of Knowledge Module:

The focus of the learning in this knowledge module is to build an understanding of operating regulations, basic power system protection, and operating of medium and high voltage networks and phasing.

The learning will enable learners to demonstrate an understanding of the topics listed below:

(b) List of Knowledge Topics:

TOPIC CODE	TOPIC TITLE	% OF TIME TO BE SPENT
KM-03-KT01	Operating regulations	40
KM-03-KT02	Basic power system protection	15
KM-03-KT03	Operating of medium and high voltage networks and phasing theory	45

(c) Detailing each topic listed above into topic elements:

KM-03-KT01 Operating regulations 40%		
TOPIC ELEMENT CODE	**TOPIC ELEMENT TITLE**	**% OF TIME TO BE SPENT**
KT0101	General requirements	5
KT0102	Access	10
KT0103	Keys	5
KT0104	Safe operating and work practices	30
KT0105	Work permits	20
KT0106	Testing and commissioning of apparatus	20
KT0107	Abnormal conditions	10

(d) Internal Assessment Criteria (IAC) and Weight

IAC CODE	IAC DESCRIPTION	% OF TIME TO BE SPENT
IAC0101	Discuss the general minimum requirements for operations in terms of control of power systems, duties and responsibilities of control officers, issuance of receipt, retention and clearance of operating instructions powering up apparatus on first installation or after alteration or repairs	5
IAC0102	Discuss the different access requirements in terms of duties and responsibilities of authorized persons when arriving at the substation and access to live chambers, prohibited and restricted areas	10
IAC0103	Discuss the requirements for keys in terms of live chambers and prohibited or restricted areas at power stations and for live chambers and prohibited or restricted areas	5
IAC0104	Safe operating and work practices in terms of switching, isolating, safety testing and earthing operations, making apparatus safe, warning notices, displaying earthing labels, safety testing of feeders or apparatus, earthing, work on lines or apparatus, returning apparatus to service, exemption from general procedure, and supervision	30
IAC0105	Discuss operating procedures in terms of work permits	20
IAC0106	Testing and commissioning of apparatus in terms of generation system, distribution system, and no switching while work is in progress in a live chamber	20
IAC0107	Discuss operating procedures in terms of abnormal conditions (including reports to the control officer, risk of tripping, emergency switching, communications system, restoration of supply, establishment of a temporary local control centre, and re-energising of overhead lines)	10

(c) Detailing each topic listed above into topic elements:

KM-03-KT02. Basic power system protection 15%		
TOPIC ELEMENT CODE	**TOPIC ELEMENT TITLE**	**% OF TIME TO BE SPENT**
KT0201	Basic power systems protection 11 to 33kV	40
KT0202	Basic power systems protection 44 to 132kV	60

(d) Internal Assessment Criteria (IAC) and Weight

IAC CODE	IAC DESCRIPTION	% OF TIME TO BE SPENT
IAC0201	Discuss the effects of an electrical fault in terms of the effects, how it occurs and types.	4
IAC0202	Discuss the purpose of protection in terms of reasons, basic requirements for protection schemes, and equipment used for protection (protective gear) schemes	4
IAC0203	Discuss current transformers (CT's) and voltage transformers (VT's) in terms of functions and types	6
IAC0204	Discuss circuit breakers in terms of definition and requirements	3
IAC0205	Discuss voltage correction/regulation on distribution systems in terms of customer distribution transformers, transformer tap changer, voltage regulators, capacitor banks	6
IAC0206	Discuss on-unit protection schemes in terms of distribution and reticulation lines, and fault locators	3
IAC0207	Discuss relays in terms of basic operation of a protection relay, methods of setting relays, and Different types of relays	6
IAC0208	Discuss enclosures and sectionalisers in terms of auto-reclose on distribution/ reticulation systems, reclosers, and current and voltage sectionalisers	8
IAC0209	Discuss voltage transients and surge arresters	3
IAC0210	Identify and discuss power transformers in terms of functions, operating principles, parts, cooling, failures and causes, and types (including transformers with tertiary windings. Auto-transformers, and neutral earthing compensator)	25
IAC0211	Discuss on-load tap changers in terms of operation, substation distribution transformers, generation transformers, methods of tap changing, tap change diverter resistor, tap change mechanism timer, tap change motor running timer, parallel timer, tap changing operation	8
IAC0212	Discuss HV protection in terms of restricted earth fault protection, circulating current differential protection, tap change overcurrent, transformer overcurrent and earth fault protection, backup earth fault protection, high set overcurrent, line and unit type protection, unit protection schemes, distance protection schemes (impedance), busbar/bus-zone protection, bus strip protection, non-unit protection schemes networks, distance protection	16

	schemes (impedance), overvoltage protection, undervoltage protection, underfrequency protection and capacitor protection.	
IAC0213	Discuss transmission systems in relation to auto reclose on transmission systems and pole discrepancy/disagreement	4
IAC0214	Interpret alternating current (AC) and direct current (DC) diagrams and associated symbols	2
IAC0215	Discuss battery earth faults (BE/F)	2

(c) Detailing each topic listed above into topic elements:

KM-03-KT03 Operating of medium and high voltage networks and phasing theory 45%		
TOPIC ELEMENT CODE	**TOPIC ELEMENT TITLE**	**% OF TIME TO BE SPENT**
KT0301	Operating on medium voltage networks	40
KT0302	Operating on high voltage networks	40
KT0303	Phasing 110V to 132kV	20

(d) Internal Assessment Criteria (IAC) and Weight

IAC CODE	**IAC DESCRIPTION**	**% OF TIME TO BE SPENT**
IAC0301	Discuss the legal requirements in relation to authorisations and processes related to operating on medium voltage networks	40
IAC0302	Discuss the legal requirements in relation to authorisations and processes related to operating on high voltage networks	40
IAC0303	Discuss the legal requirements in relation to authorisations and processes for phasing 110V to 132kV	20

3.3.2 Criteria for accreditation

Physical Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
EQUIPMENT & TOOLS	• Physical training facilities (or if using a hybrid or e-learning model – software or internet platform) conducive to hosting the number of learners comfortably and safely for the duration of this module. • Facilities that meet the minimum requirements for the comfort of learners (ablutions, hand washing facilities, sheltered from the elements etc.) if relevant.

	• All learning materials, lesson plans, workbooks, assessment guides to cover the related topics. • All learning materials, lesson plans, workbooks, assessment guides to cover the related topics. • Internal summative assessment instruments (if not online).
CONSUMABLES	• None

Human Resource Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
QUALIFICATIONS & EXPERIENCE	Qualification of lecturer/facilitator (SME): • Qualified as an Electrician or Electrical line Mechanic. • Have been authorised up to 132 kV with 5 years' experience practicing as an authorised operator. • Must be a registered assessor and moderator.
FACILITATOR/LEARNER RATIO	1: maximum 20

Legal Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
	• CIPC registered entity. • SARS Tax compliance • Compliant and current health and safety audit report. • Relevant labour legislation visible in facility or on platform (as required by current legislation). • POPIA compliant.

Additional Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)
• None.

3.3.3 Exemptions

None

3. 4 900522-000-00-KM-04, Equipotential earthing, NQF Level 5, Credits 3

MODULE CODE	MODULE TITLE	NQF LEVEL	CREDITS	MODE OF DELIVERY
900522-000-00-KM-04	Equipotential earthing	5	3	Blended

3.4.1 Module Details:

(a) Purpose of Knowledge Module:

The focus of the learning in this knowledge module is to build a basic understanding equipotential earthing.

The learning will enable learners to demonstrate an understanding of the topics listed below.

(b) List of Knowledge Topics:

TOPIC CODE	TOPIC TITLE	% OF TIME TO BE SPENT
KM-04-KT01	Equipotential earthing	100

(c) Detailing each topic listed above into topic elements:

KM-04-KT01: Equipotential earthing 100%		
TOPIC ELEMENT CODE	**TOPIC ELEMENT TITLE**	**% OF TIME TO BE SPENT**
KT0101	Introduction to equipotential earthing	10
KT0102	Procedures for the application of earthing on lines	20
KT0103	Procedures for the earthing of substations	20
KT0104	Procedures for the use of equipotential footplates	20
KT0105	Scenarios of equipotential earthing	20
KT0206	Inspection, maintenance, and recordkeeping of equipment.	10

(d) Internal Assessment Criteria (IAC) and Weight

IAC CODE	IAC DESCRIPTION	% OF TIME TO BE SPENT
IAC0101	Discuss why do we earth, bond and insulate, how isolated and earthed apparatus can be energized, step and touch potentials, earthing methodology, and earthing philosophy	10
IAC0102	Discuss procedures for the application of earthing on lines in terms of generic procedure for application of	20

	control earths, generic procedure for application of working earths, and specific scenarios	
IAC0103	Discuss procedures for the earthing of substations in terms of generic procedure for the application of portable earthing gear in substations, and specific scenarios	20
IAC0104	Discuss procedures for the use of equipotential footplates in terms of vehicle mounted cranes/mobile cranes/aerial devices, and gang operated isolators and air-break switches	20
IAC0105	Evaluate scenarios of equipotential earthing and provide explanations regarding what went wrong	20
IAC0106	Discuss the fundamental requirements related to inspection, maintenance, and recordkeeping of equipment.	10

3.2.2 Criteria for accreditation

Physical Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
EQUIPMENT & TOOLS	• Physical training facilities (or if using a hybrid or e-learning model – software or internet platform) conducive to hosting the number of learners comfortably and safely for the duration of this module. • Facilities that meet the minimum requirements for the comfort of learners (ablutions, hand washing facilities, sheltered from the elements etc.) if relevant. • All learning materials, lesson plans, workbooks, assessment guides to cover the related topics. • All learning materials, lesson plans, workbooks, assessment guides to cover the related topics. • Internal summative assessment instruments (if not online).
CONSUMABLES	• None

Human Resource Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
QUALIFICATIONS & EXPERIENCE	Qualification of lecturer/facilitator (SME): • Qualified as an Electrician or Electrical line Mechanic. • Have been authorised up to 132 kV with 5 years' experience practicing as an authorised operator. • Must be a registered assessor and moderator.
FACILITATOR/LEARNER RATIO	1: maximum 20

Legal Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
	• CIPC registered entity. • SARS Tax compliance • Compliant and current health and safety audit report. • Relevant labour legislation visible in facility or on platform (as required by current legislation). • POPIA compliant.

Additional Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)
• None.

3.2.3 Exemptions

None

4 Practical Skill Module (PM) Specifications:

MODULE CODE	MODULE TITLE	NQF LEVEL	CREDITS	MODE OF DELIVERY
900522-000-00-PM-01	Monitor and record the performance of electrical network equipment	5	6	Face to face
900522-000-00-PM-02	Prepare reports and make recommendations on actions to be taken	5	4	Face to face
900522-000-00-PM-03	Conduct switching, isolating, testing and earthing	5	13	Face to face
900522-000-00-PM-04	Conduct first line maintenance of electrical network equipment	5	3	Face to face

Detailing Practical Module (PM) contents

4.1 900522-000-00-PM-01, Monitor and record the performance of electrical network equipment, NQF Level 5, Credits 6

MODULE CODE	MODULE TITLE	NQF LEVEL	CREDITS	MODE OF DELIVERY
900522-000-00-PM-01	Monitor and record the performance of electrical network equipment	5	6	Face to face

4.1.1. Module Details

(a) Purpose of the Practical Skills Module:

The focus of the learning in this module is on providing the learner an opportunity to practice the skills required to monitor and record performance of transformers, and transformer protection systems, batteries, battery chargers, and switchgear and all other apparatus.

The learner will be required to perform the activities listed below:

(b) List of Practical Skill Activities:

PRACTICAL SKILL CODE	ACTIVITY TITLE
PM-01-PS01	Monitor and record performance of transformers and transformer protection systems
PM-01-PS02	Monitor and record performance of batteries and battery chargers
PM-01-PS03	Monitor and record performance of switchgear and all other apparatus

(c) Scope of each Practical Skill Activity:

PM-01-PS01: Monitor and record performance of transformers and transformer protection systems	
PRACTICAL SKILL ACTIVITY SCOPE OUTLINE:	
Given power transformers, power transformer protection systems, log sheets, and tap changers, the learner must be able to:	
PRACTICAL SKILL ACTIVITY ELEMENT CODES	**PRACTICAL SKILL ACTIVITY ELEMENTS**
PA0101	Monitor and record performance of transformers
PA0102	Monitor and record performance of transformer protection systems
PA0103	Monitor and record relay settings and flags
PA0104	Monitor and record transformer winding and oil temperatures

PA0105	Monitor and record oil levels of main tank, tap changer and conservator tank
PA0106	Monitor and record silica gel and buchulz relays

(d) Applied Knowledge that underpins the Practical Skill Activity

APPLIED KNOWLDEGE CODE	APPLIED KNOWLEDGE
AK0101	Performance of transformers

(e) Internal Assessment Criteria (IAC) for the Practical Skill Activity

IAC CODE	IAC DESCRIPTION
IAC0101	Transformers, transformer protection systems, and relay settings and flags are monitored following correct procedures and adhering to safety requirements, and readings correctly recorded.
IAC0102	Transformer winding and oil temperatures are monitored following correct procedures and adhering to safety requirements, and readings correctly recorded
IAC0103	Oil levels of main tank, tap changer and conservator tank are monitored following correct procedures and adhering to safety requirements, and readings correctly recorded
IAC0104	Silica gel and buchulz relays are monitored following correct procedures and adhering to safety requirements, and readings correctly recorded

(c) Scope of each Practical Skill Activity:

PM-01-PS02: Monitor and record performance of batteries and battery chargers	
PRACTICAL SKILL ACTIVITY SCOPE OUTLINE	
Given batteries and battery changers, the learner must be able to:	
PRACTICAL SKILL ACTIVITY ELEMENT CODES	**PRACTICAL SKILL ACTIVITY ELEMENTS**
PA0201	Monitor and record performance of batteries
PA0202	Monitor and record performance battery charger

(d) Applied Knowledge that underpins the Practical Skill Activity

APPLIED KNOWLDEGE CODE	APPLIED KNOWLEDGE
AK0201	Battery and Battery charger operations

(e) Internal Assessment Criteria (IAC)

IAC CODE	IAC DESCRIPTION
IAC0201	Batteries are monitored following correct procedures and adhering to safety requirements, and readings correctly recorded
IAC0202	Battery chargers are monitored following correct procedures and adhering to safety requirements, and readings correctly recorded

(c) Scope of each Practical Skill Activity:

PM-01-PS03: Monitor and record performance of switchgear and all other apparatus	
PRACTICAL SKILL ACTIVITY SCOPE OUTLINE	
Given switchgear, isolators, and log sheets, the learner must be able to:	
PRACTICAL SKILL ACTIVITY ELEMENT CODES	**PRACTICAL SKILL ACTIVITY ELEMENTS**
PA0301	Monitor and record performance of AC/DC chop over switches
PA0302	Monitor and record performance of all apparatus

(d) Applied Knowledge that underpins the Practical Skill Activity

APPLIED KNOWLDEGE CODE	APPLIED KNOWLEDGE
AK0301	Performance of switchgear and all other apparatus

(e) Internal Assessment Criteria (IAC)

IAC CODE	IAC DESCRIPTION
IAC0301	AC/DC chop over switches are monitored following correct procedures and adhering to safety requirements, and breaker operation counter readings are correctly recorded
IAC0302	Performance of all apparatus are monitored following correct procedures and adhering to safety requirements, and gas pressure or oil levels are correctly recorded

4.1.2. Criteria for accreditation

Physical Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
EQUIPMENT & TOOLS	• Physical training facilities (or if using a hybrid or e-learning model – software or internet platform) conducive to hosting the number of learners comfortably and safely for the duration of this module. • Facilities that meet the minimum requirements for the comfort of learners (ablutions, hand washing facilities, sheltered from the elements etc.) if relevant. • Record keeping systems to capture learner data and issue a statement of results. • The provider must have practical guidebooks with clear instructions on activities (including templates). • The provider must have power transformers, power transformer protection systems, batteries and battery changers, tap changers, and switchgear, isolators as stated in the given statements. • The provider must have logbooks/sheets to capture learner progress against the practical application activities
CONSUMABLES	• Providers must have log sheets to record equipment and apparatus readings

Human Resource Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
QUALIFICATIONS & EXPERIENCE	Qualification of facilitator: • Qualified as an Electrician or electrical line Mechanic. • Have been authorised up to 132 kV with 5 years' experience practicing as an authorised operator. • Must be a registered assessor and moderator.
FACILITATOR/LEARNER RATIO	1: maximum 5

Legal Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
	• CIPC registered entity. • SARS Tax compliance. • Compliant and current health and safety audit report. • Relevant labour legislation visible in facility or on platform (as required by current legislation). • POPIA compliant

Additional Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
	• None.

4.1.3 Exemptions

None

4.2 900522-000-00-PM-02, Prepare reports and make recommendations on actions to be taken, NQF Level 5, Credits 4

MODULE CODE	MODULE TITLE	NQF LEVEL	CREDITS	MODE OF DELIVERY
900522-000-00-PM-02	Prepare reports and make recommendations on actions to be taken	5	4	Face to face

4.2.1. Module Details

(a) Purpose of the Practical Skills Module:

The focus of the learning in this module is on providing the learner an opportunity to practice the skills required to prepare relevant data for operational reports.

The learner will be required to perform the activities listed below:

(b) List of Practical Skill Activities:

PRACTICAL SKILL CODE	ACTIVITY TITLE
PM-02-PS01	Prepare relevant data for operational reports

(c) Scope of each Practical Skill Activity:

PM-02-PS01 Prepare relevant data for operational reports	
PRACTICAL SKILL ACTIVITY SCOPE OUTLINE:	
Given sets of written texts with information on operational performance of electrical network equipment and reporting formats, the learner must be able to:	
PRACTICAL SKILL ACTIVITY ELEMENT CODES	**PRACTICAL SKILL ACTIVITY ELEMENTS**
PA0101	Document data
PA0102	Identify possible causes
PA0103	Determine the process of rectification

(d) Applied Knowledge that underpins the Practical Skill Activity

APPLIED KNOWLDEGE CODE	APPLIED KNOWLEDGE
AK0101	Preparation of operational reports

(e) Internal Assessment Criteria (IAC) for the Practical Skill Activity

IAC CODE	IAC DESCRIPTION
IAC0101	Appropriate data correctly recorded, possible causes identified, and process of rectification identified

4.2.2. Criteria for accreditation

Physical Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
EQUIPMENT & TOOLS	• Physical training facilities (or if using a hybrid or e-learning model – software or internet platform) conducive to hosting the number of learners comfortably and safely for the duration of this module. • Facilities that meet the minimum requirements for the comfort of learners (ablutions, hand washing facilities, sheltered from the elements etc.) if relevant. • Record keeping systems to capture learner data and issue a statement of results. • The provider must have practical guidebooks with clear instructions on activities (including templates). • The provider must have sets of written texts with information on operational performance of electrical network equipment reporting formats as stated in the given statements. • The provider must have logbooks/sheets to capture learner progress against the practical application activities
CONSUMABLES	• The provider must have reporting formats

Human Resource Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
QUALIFICATIONS & EXPERIENCE	Qualification of facilitator: • Qualified as an Electrician or electrical line Mechanic. • Have been authorised up to 132 kV with 5 years' experience practicing as an authorised operator. • Must be a registered assessor and moderator.
FACILITATOR/LEARNER RATIO	1: maximum 5

Legal Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
	• CIPC registered entity. • SARS Tax compliance. • Compliant and current health and safety audit report. • Relevant labour legislation visible in facility or on platform (as required by current legislation). • POPIA compliant.

Additional Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
	• None.

4.2.3 Exemptions

None

4.3 900522-000-00-PM-03, Conduct switching, isolating, testing and earthing, NQF Level 5, Credits 13

MODULE CODE	MODULE TITLE	NQF LEVEL	CREDITS	MODE OF DELIVERY
900522-000-00-PM-03	Conduct switching, isolating, testing and earthing	5	13	Face to face

4.3.1. Module Details

(a) Purpose of the Practical Skills Module:

The focus of the learning in this module is on providing the learner an opportunity to practice the skills required to conduct switching on a feeder panel, isolate supply to apparatus, and perform testing and earthing.

The learner will be required to perform the activities listed below:

(b) List of Practical Skill Activities:

PRACTICAL SKILL CODE	ACTIVITY TITLE
PM-03-PS01	Select personal protective clothing
PM-03-PS02	Conduct switching on a feeder panel
PM-03-PS03	Isolate supply to apparatus
PM-03-PS04	Perform testing
PM-03-PS05	Perform earthing

(c) Scope of each Practical Skill Activity:

PM-03-PS01: Select personal protective clothing	
PRACTICAL SKILL ACTIVITY SCOPE OUTLINE:	
Given personal protective clothing, the learner must be able to:	
PRACTICAL SKILL ACTIVITY ELEMENT CODES	**PRACTICAL SKILL ACTIVITY ELEMENTS**
PA0101	Identify ARC burn rating
PA0102	Inspect protective clothing for safety compliance (SANS 724:2010)

(d) Applied Knowledge that underpins the Practical Skill Activity

APPLIED KNOWLDEGE CODE	APPLIED KNOWLEDGE
AK0101	Safety procedures
AK0102	SANS 724:2010

(e) Internal Assessment Criteria (IAC) for the Practical Skill Activity

IAC CODE	IAC DESCRIPTION
IAC0101	Personal protective clothing appropriate to the ARC burn rating identified

(c) Scope of each Practical Skill Activity:

PM-03-PS02: Conduct switching on a feeder panel	
PRACTICAL SKILL ACTIVITY SCOPE OUTLINE	
Given a feeder panel and operating instruction sheet, the learner must be able to:	
PRACTICAL SKILL ACTIVITY ELEMENT CODES	**PRACTICAL SKILL ACTIVITY ELEMENTS**
PA0201	Apply prohibitory notice to control panel
PA0202	Switch off auto reclose and local remote switches
PA0203	Open breaker
PA0204	Complete operating instruction sheet

(d) Applied Knowledge that underpins the Practical Skill Activity

APPLIED KNOWLDEGE CODE	APPLIED KNOWLEDGE
AK0201	Switching procedures and safety requirements

(e) Internal Assessment Criteria (IAC)

IAC CODE	IAC DESCRIPTION
IAC0201	Prohibitory notice correctly applied to control panel
IAC0202	Auto reclose and local remote switches switched off following correct procedure and adhering to safety standards

IAC0203	Correct breaker opened following correct procedure and adhering to safety standards and operating instruction sheet correctly completed

(c) Scope of each Practical Skill Activity:

PM-03-PS03: Isolate supply to apparatus	
PRACTICAL SKILL ACTIVITY SCOPE OUTLINE	
Given locks and operating instruction sheet, the learner must be able to:	
PRACTICAL SKILL ACTIVITY ELEMENT CODES	**PRACTICAL SKILL ACTIVITY ELEMENTS**
PA0301	Open isolator
PA0302	Check all phases to be opened
PA0303	Apply lock out and tag out procedure
PA0304	Complete operating instruction sheet

(d) Applied Knowledge that underpins the Practical Skill Activity

APPLIED KNOWLDEGE CODE	APPLIED KNOWLEDGE
AK0301	Isolation of supply to apparatus

(e) Internal Assessment Criteria (IAC)

IAC CODE	IAC DESCRIPTION
IAC0301	Supply to apparatus isolated following correct procedure (including log out and tag out) and adhering to safety standards and operating instruction sheet correctly completed

(**c) Scope of each Practical Skill Activity:**

PM-03-PS04: Perform testing	
PRACTICAL SKILL ACTIVITY SCOPE OUTLINE	
Given electronic testing devise and operating instruction sheet, the learner must be able to:	
PRACTICAL SKILL ACTIVITY ELEMENT CODES	**PRACTICAL SKILL ACTIVITY ELEMENTS**
PA0401	Test to be dead on open side of isolator on all phases
PA0402	Complete operating instruction sheet

(d) Applied Knowledge that underpins the Practical Skill Activity

APPLIED KNOWLDEGE CODE	APPLIED KNOWLEDGE
AK0401	Testing procedure

(e) Internal Assessment Criteria (IAC)

IAC CODE	IAC DESCRIPTION
IAC0401	Supply to apparatus isolated following correct procedure (including log out and tag out) and adhering to safety standards and operating instruction sheet correctly completed.

(c) Scope of each Practical Skill Activity:

PM-03-PS05: Perform earthing	
PRACTICAL SKILL ACTIVITY SCOPE OUTLINE	
Given control earths, equipotential earths link/earthing stick, overhead dummy line, the learner must be able to:	
PRACTICAL SKILL ACTIVITY ELEMENT CODES	**PRACTICAL SKILL ACTIVITY ELEMENTS**
PA0501	Inspect earth to be in good condition
PA0502	Apply control earth beyond open isolator on all phases (no other person to touch the earth leads while application in progress)
PA0503	Apply equipotential earthing at place of work
PA0504	Complete operating instruction sheet

(d) Applied Knowledge that underpins the Practical Skill Activity

APPLIED KNOWLDEGE CODE	APPLIED KNOWLEDGE
AK0501	Earthing procedures
AK0502	Equipotential earthing

(e) Internal Assessment Criteria (IAC)

IAC CODE	IAC DESCRIPTION
IAC0501	Control and equipotential earthing procedures correctly followed whilst adhering to safety standards and operating instruction sheet correctly completed.

4.3.2. Criteria for accreditation

Physical Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
EQUIPMENT & TOOLS	• Physical training facilities (or if using a hybrid or e-learning model – software or internet platform) conducive to hosting the number of learners comfortably and safely for the duration of this module. • Facilities that meet the minimum requirements for the comfort of learners (ablutions, hand washing facilities, sheltered from the elements etc.) if relevant. • Record keeping systems to capture learner data and issue a statement of results. • The provider must have practical guidebooks with clear instructions on activities (including templates). • The provider must have personal protective clothing, feeder panel, power transformer, locks, control earths, equipotential earths link/earthing stick, overhead dummy line, and electronic testing devise operating instruction sheet as stated in the given statements. • The provider must have logbooks/sheets to capture learner progress against the practical application activities
CONSUMABLES	• Providers must have operating instruction sheets

Human Resource Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
QUALIFICATIONS & EXPERIENCE	Qualification of facilitator: • Qualified as an Electrician or electrical line Mechanic. • Have been authorised up to 132 kV with 5 years' experience practicing as an authorised operator. • Must be a registered assessor and moderator.
FACILITATOR/LEARNER RATIO	1: maximum 5

Legal Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
	• CIPC registered entity. • SARS Tax compliance. • Compliant and current health and safety audit report. • Relevant labour legislation visible in facility or on platform (as required by current legislation). • POPI policy.

Additional Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
	• None.

4.3.3 Exemptions

None

4.4 900522-000-00-PM-04, Conduct first line maintenance of electrical network equipment, NQF Level 5, Credits 3

MODULE CODE	MODULE TITLE	NQF LEVEL	CREDITS	MODE OF DELIVERY
900522-000-00-PM-04	Conduct first line maintenance of electrical network equipment	5	3	Face to face

4.4.1. Module Details

(a) Purpose of the Practical Skills Module:

The focus of the learning in this module is on providing the learner an opportunity to practice the skills required to conduct inspections and earth resistance and continuity testing of the equipotential earthing system.

The learner will be required to perform the activities listed below:

(b) List of Practical Skill Activities:

PRACTICAL SKILL CODE	ACTIVITY TITLE
PM-04-PS01	Conduct inspections of the equipotential earthing system
PM-04-PS02	Conduct earth resistance and continuity testing of the earthing system

(c) Scope of each Practical Skill Activity:

PM-04-PS01: Conduct inspections of the equipotential earthing system	
PRACTICAL SKILL ACTIVITY SCOPE OUTLINE	
Given access to an equipotential earthing system and log sheets for recording inspections, the learner must be able to:	
PRACTICAL SKILL ACTIVITY ELEMENT CODES	**PRACTICAL SKILL ACTIVITY ELEMENTS**
PA0101	Inspect the bonding conductors and connections for signs of wear, corrosion, or mechanical damage
PA0102	Inspect the ground electrode condition

(d) Applied Knowledge that underpins the Practical Skill Activity

APPLIED KNOWLDEGE CODE	APPLIED KNOWLEDGE
AK0101	Equipotential earthing system requirements

(e) Internal Assessment Criteria (IAC)

IAC CODE	IAC DESCRIPTION
IAC0201	Bonding conductors, connections, and ground electrode is inspected for signs of wear, corrosion, or mechanical damage and inspection accurately recorded

c) Scope of each Practical Skill Activity:

PM-04-PS02: Conduct earth resistance and continuity testing of the earthing system	
PRACTICAL SKILL ACTIVITY SCOPE OUTLINE	
Given access to an equipotential earthing system, earth resistance tester, and log sheets for recording inspections, the learner must be able to:	
PRACTICAL SKILL ACTIVITY ELEMENT CODES	**PRACTICAL SKILL ACTIVITY ELEMENTS**
PA0201	Conduct earth resistance testing of the earthing system
PA0202	Conduct continuity testing of the earthing system

(d) Applied Knowledge that underpins the Practical Skill Activity

APPLIED KNOWLDEGE CODE	APPLIED KNOWLEDGE
AK0201	Equipotential earthing system requirements

Internal Assessment Criteria (IAC)

IAC CODE	IAC DESCRIPTION
IAC0201	Earth resistance and continuity test results taken and accurately recorded

4.4.2. Criteria for accreditation

Physical Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
EQUIPMENT & TOOLS	• Physical training facilities (or if using a hybrid or e-learning model – software or internet platform) conducive to hosting the number of learners comfortably and safely for the duration of this module. • Facilities that meet the minimum requirements for the comfort of learners (ablutions, hand washing facilities, sheltered from the elements etc.) if relevant. • Record keeping systems to capture learner data and issue a statement of results.

	• The provider must have practical guidebooks with clear instructions on activities (including templates). • The provider must have access to an equipotential earthing system and earth resistance tester as stated in the given statements. • The provider must have logbooks/sheets to capture learner progress against the practical application activities
CONSUMABLES	• In addition, providers must have log sheets to record equipment and apparatus readings

Human Resource Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
QUALIFICATIONS & EXPERIENCE	Qualification of facilitator: • Qualified as an Electrician or electrical line Mechanic. • Have been authorised up to 132 kV with 5 years' experience practicing as an authorised operator. • Must be a registered assessor and moderator.
FACILITATOR/LEARNER RATIO	1: maximum 5

Legal Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
	• CIPC registered entity. • SARS Tax compliance. • Compliant and current health and safety audit report. • Relevant labour legislation visible in facility or on platform (as required by current legislation). • POPIA compliant.

Additional Requirements:

SKILLS DEVELOPMENT PROVIDER (SDP)	
	• None.

4.4.3 Exemptions

None

5 POSSIBLE SEQUENCING AND INTEGRATION

Listing and order of modules in the sequence in which these modules will follow each other during delivery/implementation. This allows for integration of KM, AM (PM/ WM) as work logically flows.

ORDER	MODULE TITLE	MODULE CODE	LEVEL	CREDITS
1.	Health, safety and risk assessment in high voltage areas	900522-000-00-KM-01	7	
2.	Standard for supervision of people in electrically hazardous locations	900522-000-00-KM-02	3	
3.	Network voltage operating principles	900522-000-00-KM-03	13	
4.	Equipotential earthing	900522-000-00-KM-04	3	
5.	Monitor and record the performance of electrical network equipment	900522-000-00-PM-01	6	
6.	Prepare reports and make recommendations on actions to be taken	900522-000-00-PM-02	4	
7.	Conduct switching, isolating, testing and earthing	900522-000-00-PM-03	13	
8.	Conduct first line maintenance of electrical network equipment	900522-000-00-PM-04	3	