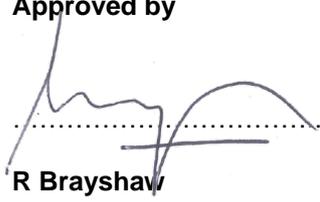


	Scope of Work	Grootvlei Power Station
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Title: Grootvlei Power Station Electrical Maintenance Services Contract (Scope of Work)	Unique Identifier: Area of Applicability: Documentation Type: Revision: Total Pages: Next Review Date: Disclosure Classification:	GVL/0473 Grootvlei Electrical Scope of Work 1 56 As required CONTROLLED DISCLOSURE
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EXECUTIVE SUMMARY

This document describes the scope of work required for the maintenance and support of the entire electrical plant at Grootvlei Power Station, which includes:

- Electrical Maintenance.
- Electrical Support Services.
- Emergency Breakdown Services.
- Electrical Outages.

Services rendered are for the duration of the contract, from start date to completion date.

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1. INTRODUCTION

This document describes the scope of work required for the maintenance and support of the entire electrical plant at Grootvlei Power Station, which includes Electrical Maintenance, Electrical Support Services, Emergency Breakdown Services and Electrical Outages. Services rendered are for the duration of the contract, from start date to completion date.

2. SUPPORTING CLAUSES

2.1 SCOPE

2.1.1 Purpose

The purpose of this document is to describe the maintenance and related services for the electrical plant at Grootvlei Power Station, including Common Plant and Vaal Dam, as per the Services Information.

2.1.2 Applicability

This document shall apply to the Electrical Plant of Grootvlei Power Station.

2.2 NORMATIVE/INFORMATIVE REFERENCES

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

2.2.1 Normative

- [1] ISO 9001, Quality Management Systems.
- [2] ISO 14001, Environmental Management.
- [3] ISO 18001, Documentation control; Occupational Health and Safety Management.
- [4] Occupational Health and Safety Act (OHS Act; No 85 of 1993).

2.2.2 Informative

- [5] N/A.

2.3 DEFINITIONS

Definition	Description
Comprehensive Report	means a certificate as contemplated in the relevant health and safety standard incorporated internal to these Regulations.
Modification	means any alteration to a plant system affecting the control, load, travel or safety thereof.
Operator	means a person who is selected, trained, assessed, and authorised in terms of legislation to operate specific equipment.
Plant	is defined in this Scope of Work.
Work/Services	is the physical activities carried out, and is internal interpreted as per the definition of the NEC 3 of June 2005.

2.3.1 Disclosure Classification

Controlled Disclosure: Controlled Disclosure to external parties (either enforced by law, or discretionary).

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2.4 ABBREVIATIONS

Abbreviation	Description
CoE	Centre of Excellence
DOL	Department of Labour
ECSA	Engineering Council of South Africa
EOD	Electrical Operating Desk
GMR 2(7)	General Machinery Regulation 2(7)
LAR	Local Access Register
NEC	New Engineering Contract
OEM	Original Equipment Manufacturer
OHS	Act Occupational Health and Safety Act 85 of 1993
PSM	Power Station Manger
PSR	Plant Safety Regulations
QCP	Quality Control Plan
SANS	South African National Standards
SAP	Systems Application Processes
SMAT	Safety Management Auditing Technique

2.5 ROLES AND RESPONSIBILITIES

N/A.

2.6 PROCESS FOR MONITORING

N/A.

2.7 RELATED/SUPPORTING DOCUMENTS

Please refer to Section 2.2.

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3. DESCRIPTION OF THE SERVICES

3.1 OVERVIEW

The scope described in this document is for general electrical maintenance services, to be carried out by the Electrical Maintenance Department at Grootvlei Power Station, including Common Plant and Vaal Dam. The services support the Strategic objectives of Electrical Maintenance, Support Services, Emergency Breakdown Services, and Electrical Outages for all areas of Grootvlei Power Station's Electrical Plant, as per the Service Information. Services rendered are for the duration of the contract, from start date to completion date.

3.1.1 General Maintenance Services

The contractor does first line investigation and services on electrical plant at Grootvlei Power Station. Services are for the entire Electrical Plant of Grootvlei Power Station and associated facilities. The service are for all current and future installations, which shall include all electrical outage work, project installations, routine maintenance, repairs, inspections, cleaning, support services, statutory inspections, emergency breakdown services and defect correction during normal and abnormal plant condition or operation, to ensure the integrity of the electrical plant at Grootvlei Power Station.

These will include services on: Transformers, MV motors, LV motors, cables, MV switchgear, LV switchgear, High Voltage (HV), Medium Voltage (MV), and Low Voltage (LV) Distribution networks for AC and DC systems, power station lighting, electrical actuators, switching devices, control circuits, heater circuits and small power supplies which are contained within, but not limited to, the premises of Grootvlei Power Station.

3.1.2 Cable Services

Cable services include: Testing of LV cables, tracing, commissioning of Power and Control cables. The services also include installation, maintenance, and repairs on earthing systems, as well as emergency breakdown and repair services of cables and earthing systems at Grootvlei Power Station for Electrical Maintenance and Projects.

3.2 EMPLOYER'S OBJECTIVES AND PURPOSE OF THE SERVICE

The services are for the entire electrical plant maintenance of Grootvlei Power Station and associated facilities. The services are for all current and future installations which shall include all related electrical project installations, outage work, routine maintenance, repairs, inspections & cleaning, support services, statutory inspections, emergency breakdown services, structural repairs and defect correction during normal and abnormal plant condition or operation, to ensure the integrity of the electrical plant at Grootvlei Power Station within the boundaries of the site.

The Service Provider shall through execution of the services ensure that all electrical systems are safe and operational. These will include transformers, drive motors, actuators, limit switches, control circuits, heater circuits, supply cables, and small power supplies which are contained within but not limited to the Coal, Ash, Boiler, Water treatment, Coal offloading facility, Sewage infrastructure and Turbine plants and its sub systems.

This is an all-inclusive maintenance package for all Electrical Systems at Grootvlei Power Station. The contract will include provision of support and emergency breakdown services for Grootvlei Power Station plant as per the Service Information. Services rendered are for the duration of the contract, from the start date to the completion date.

At the start of the contract, the Service Provider commits to ensuring that 50% of technical staff shall be authorized in terms of PSR (Low Voltage) and ORHVS (High Voltage) to be able to perform the activities covered in this specification. Failing to do so will result in a 5% deduction on monthly Gross labour charged,

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effective after three months when the contract is in place/signed. Continuous failure to comply will lead to NCRs and possible termination of contract as per KPI requirements. The objective is to ensure that all electrical plant receives the highest degree of attention in quality engineering, operational and maintenance, in alignment to South Africa National Standards (SANS).

NOTE: Not being fully accredited and compliant to below ISO standards for the duration of contract will automatically disqualify the Supplier for further evaluation.

- ISO 9001: Quality Management System.
- ISO 14001: Environmental Management.
- ISO 18001: Documentation Control; Occupational Health and Safety Management.

The maintenance and management of Electrical installations is to ensure that they are maintained and inspected to the highest degree in accordance with the SANS standards and the OHS Act, and to ensure that no injury or fatality will occur in relation to such installations that could have been anticipated or foreseen. The Service Provider shall through execution of the services ensure that all systems are safe and operational.

3.3 EXCLUSION OF SERVICES AND SERVICES EXECUTED BY OTHER PARTIES

Services provided by Electrical Maintenance Department shall exclude the following, which are carried out by the PTM department:

3.3.1 HVAC Systems

Maintenance of air Conditioner units is done by others.

3.3.2 Power Electronics

- a) Battery charger and rectifier units are done by others.
- b) Uninterruptable Power Supplies (UPS), Voltage Dip Inverters (DPI), and Variable Speed Drives (VSD) units are done by others.
- c) Battery maintenance services are done by others.

3.3.3 Protection Maintenance

- a) All secondary plant equipment fitted and connected with modern communication equipment/networks are done by others.
- b) All secondary plant fitted and connected with legacy technology equipment and communication networks are done by others.
- c) Generator Protection systems are done by others.
- d) GCB protection functionality testing is done by others, including close coils and trips coils.
- e) Excitation and AVR Systems are done by others.
- f) Secondary Plant maintenance and testing of Power, Auxiliary and Earthing Transformers is done by others.
- g) Maintenance of Instrument Transformers (CTs and VTs) is done by others.
- h) Maintenance of secondary measurement equipment and related equipment of MV motors is done by others.
- i) Maintenance of Protection relays is done by others.
- j) Secondary LV circuit maintenance of MV, HV, metal clad switchgear systems is done by others.

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- k) Maintenance of Metering and Measurement Systems, including EMDAS, is done by others.

3.3.4 SCASS/SCADA Systems

- a) Maintenance and telecontrol testing is done by others.
- b) Secondary circuit Maintenance of Electric Fences (control units, energizers, computer system and screens) is done by others.
- c) Maintenance of AGC systems is done by others.

3.4 INTERFACE REQUIREMENTS

Besides the exclusions highlighted in Section 3.3, Electrical Maintenance will interface with other departments or service Providers, some of whom will require the isolation, disconnection, reconnection, cleaning, installation and/or removal of components, wiring, equipment, or safe access to electrical systems. These activities are not excluded from the scope of Electrical Maintenance services.

3.5 OPERATING PHILOSOPHY

Grootvlei Power Station operates on a 24-hour basis, 7 days per week in continuous load following mode or as the Employer may deem necessary to provide sustainable electrical supply to the electrical network.

3.6 MAINTENANCE PHILOSOPHY

The Service Provider provides all services, specialized tools and Equipment, specialist personnel, and all associated maintenance services to accomplish and execute the requirements of the Service Information. The Service Provider provides specialist technical consulting services, which support the optimum and continuous operation of the Employer's assets on an "as and when" required basis.

The services are performed on existing and new installations and comply with good engineering and maintenance practices and standards for fossil fuelled power plants and conforms to the Legal, Environmental, Health and Safety, Quality and other Eskom specifications, procedures, standards and conditions prevailing at the Site.

In these terms, the Service Provider shall maintain, issue all legal documentation, and requirements, and certification to ensure compliance. Maintenance will be carried out in the following categories and Grootvlei follows the SAP computerised business Planning and Execution for maintenance services:

3.6.1 Corrective Maintenance

Corrective maintenance is carried out after a failure has occurred and is intended to restore an item to a state in which it can perform its required function.

3.6.2 Preventive Maintenance

Preventative maintenance is carried out at pre-determined intervals, or corresponding to prescribed criteria, and is intended to reduce the probability of failure, or the performance degradation of an item.

3.6.3 Planned Maintenance

Planned maintenance is the work performed during a planned (scheduled) outage of the specific plant or generating unit in question.

3.6.4 Routine Maintenance

Routine maintenance is time-based maintenance work, performed with the plant either ON or OFF load.

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3.6.5 General Overhaul

A General Overhaul (GO) is a declared outage when a Generating unit is taken off-line. During this outage, all plant having no redundancy is overhauled to ensure reliable and safe operation.

3.6.6 Mini General Overhaul

During a mini GO, the following interventions will be attended to:

- a) Plant items with no redundancy and which will not remain reliable up to the next GO.
- b) Inspections of suspect plant items.

3.6.7 Opportunity Maintenance and Repairs.

These are short outages between General Outages to enable essential repairs and inspections to be executed. The Service Provider maintains a list of issues to be attended to and repaired during short outages, with this list issued to Engineering on a weekly basis for comment and approval.

4. LEGISLATION AND SITE REGULATIONS

All Service Providers shall, before commencement of services ensure that all their employees are familiar with the relevant Eskom Grootvlei SHE documentation applicable to contract services.

The Service Provider conforms to all prevailing Legal requirements of the Republic of South-Africa, Eskom SOC Limited and Grootvlei Power Station Site Legal requirements, with special reference but not limited to the following:

- a) Occupational Health and Safety Act 85 of 1993 as amended and its regulations.
- b) Compensation for Occupational Injuries and Diseases Act 130 of 1993 as amended.
- c) National Environmental Management Act 107 of 1998 as amended.
- d) National Environmental Waste Act 59 of 2008 as amended.
- e) National Water Act 36 of 1998 as amended.
- f) Eskom procedures and safety requirements set out in Safety, Health and Environmental specifications.
- g) Eskom procedure 32-95 in regards with the management of safety, health and environmental incidents.
- h) SANS 10400: National Building Regulations.
- i) Plant Safety Regulations (PSR) 36-681 – Generation Plant Safety Regulations.
- j) GGPP0592: Generation Policy: Power Station Plant Classification.
- k) SANS Standards, as applicable to the respective plant.
- l) The Constitution of the Republic of South Africa, particularly Section 24 of the Bill of Rights.
- m) Environment Conservation Act 73 of 1989.
- n) Civil and Building Work Act.
- o) National Road Traffic Act 93 of 1996.

Any other act or procedure deemed necessary or applicable if the work includes some toxic and/or hazardous substances during normal and routine maintenance activities are also adheres to. In such cases, the Service Provider handles such hazardous substances in accordance with the applicable regulations and procedures, disposed of by the Service Provider in accordance with the applicable law.

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4.1 STANDARDS AND SPECIFICATIONS

Table 1 provides an indication of SANS standards to be in the possession of the Service Provider during the duration of the Contract, with additional standards to be enforced as applicable to the plant. The Employer provides all standards, regulations or requirements developed by the Employer or the Organisation.

Table 1: Standards and Specifications

Item	Description/Title	Rev
1	240-50237155: New MV Motor Procurement Standard.	Latest
2	240-56176097: Electrical Cable Schedule Template.	Latest
3	240-56227443: Eskom Requirements for control and power cables for power stations.	Latest
4	240-56227516: LV Switchgear Control Gear Assembly Associated Equipment for Voltage 1000V AC and 1500V Standard.	Latest
5	240-56355815: Field Instrument Installation Standard - Junction Boxes and Cable Termination.	Latest
6	240-56360387: Storage of Power Station Electric Motors Standard.	Latest
7	240-56361435: Transport of Power Station Electric Motors Standard.	Latest
8	240-56536505: Hazardous Locations Standard.	Latest
9	240-57617975: Procurement of Power Station Low Voltage Electric Motors Specification Standard.	Latest
10	240-86239967: Management of Hazardous Locations.	Latest
11	36-943 Engineering drawing office and engineering document standard.	Latest
12	36-944 General drawing standard WI.	Latest
13	36-946 WI for electrical drawings and documentation.	Latest
14	474-11542 Generation Plant General Electrical Specification	Latest
15	ARP 0108: Regulatory requirements for explosion-protected apparatus.	Latest
16	Drawing 0.00/1310: Standard power and control cable code.	Latest
17	Eskom 0.54/393 Eskom Earthing Standard Drawings.	Latest
18	Eskom GGR0992 Plant Safety Regulations.	Latest
19	Eskom GGR0992 Plant Safety Regulations.	Latest
20	Eskom NWS 1007/P: The Management of Construction.	Latest
21	Eskom NWS 1058: Safety on Construction Sites: Requirements which Service Providers must comply with.	Latest
22	GGG0450 Guideline to acceptance of Service Provider drawings.	Latest
23	GGG0315 Standard drawing practise.	Latest
24	NWS 1220: Specification for cable junction and reduction boxes for power stations.	Latest
25	SANS 10086-1: The installation, inspection and maintenance of equipment used in explosive atmospheres Part 1: Installations including surface installations on mines.	Latest
26	SANS 10086-3: The installation, inspection and maintenance of equipment used in explosive atmospheres Part 3: Repair and overhaul of equipment.	Latest

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Item	Description/Title	Rev
27	SANS 10108: The classification of hazardous locations and the selection of equipment for use in such locations.	Latest
28	SANS 10119: Reduction of explosion hazards presented by electrical equipment - Segregation, ventilation and pressurization.	Latest
29	SANS 10123: The control of undesirable static electricity.	Latest
30	SANS 10142-1 SABS 0142-1 2009 1.07 The wiring of premises Part 1: Low-voltage installations.	Latest
31	SANS 10142-1: The wiring of premises Part 1: Low-voltage installations.	Latest
32	SANS 10142-2 2009 1 The wiring of premises Part 2: Mediumvoltage installations above 1 kV a.c. not exceeding 22 kV a.c. and up to and including 3 000 kW installed capacity.	Latest
33	SANS 10198 All parts selection and handling of cables.	Latest
34	SANS 10313: Protection against lightning - Physical damage to structures and life hazard.	Latest
35	SANS 1339 Electric cables - Cross-linked polyethylene (XLPE) insulated cables for rated voltages 3,8/6,6 kV to 19/33 kV.	Latest
36	SANS 1339 SABS 1339 2010 4 Electric cables - Cross-linked polyethylene (XLPE) insulated cables for rated voltages 3,8/6,6 kV to 19/33 kV.	Latest
37	SANS 1411-1 Materials of insulated electric cables and flexible cords Part 1: Conductors.	Latest
38	SANS 1411-2 Materials of insulated electric cables and flexible cords Part 2: Polyvinyl chloride (PVC).	Latest
39	SANS 1411-3 Materials of insulated electric cables and flexible cords Part 3: Elastomers.	Latest
40	SANS 1411-4 Materials of insulated electric cables and flexible cords Part 4: Cross-linked polyethylene (XLPE).	Latest
41	SANS 1411-5 Materials of insulated electric cables and flexible cords Part 5: Halogen-free, flame-retardant materials.	Latest
42	SANS 1411-6 Materials of insulated electric cables and flexible cords Part 6: Armour.	Latest
43	SANS 1411-7 Materials of insulated electric cables and flexible cords Part 7: Polyethylene (PE).	Latest
44	SANS 1507-1 SABS 1507-1 2007 1.01 Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1 900/3 300 V) Part 1: General.	Latest
45	SANS 1507-2 SABS 1507-2 2007 1.01 Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1 900/3 300 V) Part 2: Wiring cables.	Latest
46	SANS 1507-3 SABS 1507-3 2007 1.01 Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1 900/3 300 V) Part 3: PVC.	Latest

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Item	Description/Title	Rev
47	SANS 1507-4 SABS 1507-4 2009 1.02 Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1 900/3 300 V) Part 4: XLPE Distribution cables.	Latest
48	SANS 1507-5 SABS 1507-5 2009 1.02 Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1 900/3 300 V) Part 5: Halogen-free distribution cables.	Latest
49	SANS 1507-6 SABS 1507-6 2007 1.02 Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1 900/3 300 V) Part 6: Service cables.	Latest
50	SANS 1574-1 Electric flexible cables with solid extruded dielectric insulation Part 1: General.	Latest
51	SANS 1574-2 Electric flexible cables with solid extruded dielectric insulation Part 2: PVC insulated flexible cables for domestic, office and similar environments (cords).	Latest
52	SANS 1574-3 Electric flexible cables with solid extruded dielectric insulation Part 3: PVC-insulated cables for industrial use.	Latest
53	SANS 1574-4 Electric flexible cables with solid extruded dielectric insulation Part 4: Rubber-insulated cables for domestic, office and similar environments (cords).	Latest
54	SANS 1574-5 Electric flexible cables with solid extruded dielectric insulation Part 5: Rubber-insulated cables for industrial use.	Latest
55	SANS 529 SABS 529 2007 3 Heat-resisting wiring cables Latest SANS 808 SABS 808 1967 1 Cable glands for use on flameproof enclosures (Ex d).	Latest
56	SANS 60079-0: Explosive atmospheres Part 0: Equipment - General requirements.	Latest
57	SANS 60079-10-1: Explosive atmospheres Part 10-1: Classification of areas - Explosive gas atmospheres.	Latest
58	SANS 60079-10-2: Explosive atmospheres Part 10-2: Classification of areas - Combustible dust atmospheres.	Latest
59	SANS 60079-14: Explosive atmospheres Part 14: Electrical installations design, selection and erection.	Latest
60	SANS 60079-17: Explosive atmospheres Part 17: Electrical installations inspection and maintenance.	Latest
61	SANS 60079-19: Explosive atmospheres - Part 19: Equipment repair, overhaul and reclamation.	Latest
62	SANS 60079-20-1: Explosive atmospheres Part 20-1: Material characteristics for gas and vapour classification - Test methods and data.	Latest
63	SANS 60079-26: Explosive atmospheres Part 26: Equipment with equipment protection level (EPL) Ga.	Latest
64	SANS 60529: Degrees of protection provided by enclosures (IP Code).	Latest
65	SANS 61241-0: Electrical apparatus for use in the presence of combustible dust Part 0: General requirements.	Latest
66	SANS 62305-1: Protection against lightning Part 1: General principles.	Latest

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Item	Description/Title	Rev
67	SANS 62305-2: Protection against lightning Part 2: Risk management.	Latest
68	SANS 62305-3: Protection against lightning Part 3: Physical damage to structures and life hazard.	Latest
69	SANS 62305-4: Protection against lightning Part 4: Electrical and electronic systems within structures.	Latest
70	SANS 876 2009 1 Cable terminations and live conductors within air-filled enclosures (insulation co-ordination) for rated a.c. voltages from 7,2 kV up to and including 36kV.	Latest
71	SANS 97 SABS 97 2010 7 Electric cables - Impregnated paperinsulated metal-sheathed cables for rated voltages 3,3/3,3 kV to 19/33 kV (excluding pressure assisted cables).	Latest

4.2 PLANT SAFETY REGULATIONS (PSR) AND OPERATING REGULATIONS FOR HIGH VOLTAGE SYSTEMS (ORHVS)

The Service Provider ensures that all employees (Supervisory and Responsible) under his/her control are authorised in terms of both Eskom PSR and ORHVS site specific regulations for the duration of the contract.

The Service Provider's staff are authorised within 3 months from the start date of the Contract, with all supervisors and Electricians authorised in terms of PSR and ORHVS. There is no Cost Element in this regard, as the training is Site Specific and for the Employer cost.

The Service Provider oversees and manages the health and safety of his/her own employees, and gives access to other parties on plant and equipment under the Service Provider's control in terms of ORHVS.

The Service Provider ensures that responsible and supervisory personnel are available at planned time of commencement for all work to be performed in line with Eskom's Permit to Work system (PSR and ORHVS).

On arrival at site, a Risk Assessment is performed by a Competent or Responsible person in order to determine the nature of the Permit To Work required, the risk to Trip or Load Loss, as well as any preventative measures required to safely execute the work. The Service Provider supervises and manages the health and safety, and gives access to other parties on plant and equipment under the Service Provider's control in terms of ORHVS.

The Service Provider manages and maintains authorisation of his/her employees, maintains records of authorised employees, manages re-authorisation and reports statistics in a monthly site report to the Employer.

The Regulations are continually audited, the Service Provider assists and conforms to these audit requirements, implementing and rectifying findings and shortfalls.

Any violation to these regulations shall be investigated, and immediate corrective action taken towards complying, and corrective action against defaulting/non-adhering individuals. The Service Provider to take note of and adherence to the Eskom's Cardinal "Life Saving Rules", which are non-negotiable.

4.3 MAINTENANCE AND MODIFICATION REQUIREMENTS

Any modification to a cable system or electrical installation is regarded as a modification by default, unless stated otherwise by Engineering. The Service Provider follows the appropriate requirements for the specific level of plant modification, highlighting any deviations from the established design base. All upgrades and modifications will be approved by a professional engineer registered with ECSA, with experience in the field.

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All breakdowns and callouts to the service Provider are logged in a call-out register, at a manned control room (EOD), with a reference number, time, date and nature of defect for record purposes.

Where certain aspects of the maintenance, management, modification or upgrade of services are contracted out, verification by experienced staff is required to ensure full compliance to legislation and applicable standards.

In cases where doubt exists regarding the correct identification of plant to be worked on, such plant will be proven by all means, until it could be verified for repairs, with all local isolation procedures to be followed according to PSR and ORHVS.

The competent Service Provider shall have a formal risk assessment process, identifying risks associated with the Services rendered for every service provided. The Service Provider implements a QCP for all activities carried out by the competent Service Provider.

4.3.1 Maintenance

The Service Provider manages and maintains the Plant by adhering to all Legal, Site Regulations, policies, standards, and procedures when executing work. All personnel, equipment, spares or any material used to perform functions as outlined in this document shall be approved for use by the Employer, including but not limited to certification, expiration and qualification.

The Service Provider:

- a) Disconnects and reconnects required power cables as per cable and load schedules.
- b) Inspects, tests and repairs Earthing on all the Units and Common Plant when required.
- c) Issues Certificate of Compliance for work done as per referenced standards.
- d) Provides knowledge and recommendations on other plant falling within his/her field of expertise.
- e) Investigates, identifies and reports potential plant failures as per Task order.
- f) Recommends actions and modifications, as well as system and process changes.
- g) Participates in investigations, and attend meetings as required.
- h) Ensure efficient overall organisation of personnel and services.

The Service Provider issues a monthly report to the Service Manager as agreed between both parties. This report includes all work done to date, work in progress (including the status) and future work if an order is already in place during the preparation of the report, as well as any other work that the Service Provider is busy with. The report also includes a copy of all the invoices issued during that month.

The Service Provider communicates the decommissioning and/or removal of any unused cable to the Service Manager or authorised delegate before storage and/or removal of that cable in the designated area.

4.3.2 General Maintenance Requirements

4.3.2.1 Plant Labelling, Coding, Notices and Signage

The Service Provider demonstrates familiarity and compliance to the standardised KKS plant labelling system. The Service Provider inspects and maintains on continuous basis, all labelling, notices and signs of electrical equipment and plant under his/her control. All non-labelled or defective labelling shall be reported to the Employer for replacement, to be done by engineering Support Services.

All Notices and signs shall be affixed to the Plant, any discrepancies shall be reported, and repairs/replacement brought in effect. Deviations from approved plant status quo are loaded as defects on SAP system for repair.

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In instances where the Employer cannot provide labelling, provisions shall be made by the Service Provider to provide labelling according to Eskom requirements and specifications.

4.3.2.2 Substations

The Service Provider manages, inspects and maintains all Grootvlei Electrical substations, according to Maintenance philosophies to be submitted separately:

- a) Monthly inspections shall be carried by the Service Provider and report on the status of each and every Electrical substation at Grootvlei.
- b) The Service Provider shall have an approved "Substation Inspection Sheet" detailing the Interventions of the Inspection, with section for defects observed, and defect numbers generated. This sheet will be kept on file for the Report, and submitted to Service manager.
- c) The inspection report shall observe as a minimum the following: Notices and Signs to be replaced, the building walls, floors, windows, doors, roofs and ceilings, water leaks, small power and lighting, cleanliness, earth leakage reporting, tripped circuitry, condition of switchgears, Earthing and cabling installation, loss and damage due to theft, general notifications observed, and remedial action taken.
- d) The substation is cleaned, debris is removed, the floor is swept and wet mopped, with the Ops Support team, tasked with cleaning activities, granted access by an approved person.
- e) No defective equipment or defective apparatus shall remain in a substation. It shall be cleared and discarded or returned to, in the correct manner as per conditions prevailing at site. No electrical consumables shall be left in the substation after maintenance (defective fuses, cleaning materials, defective components, etc.)
- f) All lighting circuits shall be inspected and ensure all substation lighting is in working order and repaired where required. This will be executed with the monthly inspection works packages as planned in the SAP system.
- g) All small power socket outlets shall be in working condition, labelled, safe and securely installed, any defective circuit and equipment shall be immediately repaired.
- h) All small power distribution boards inspected, cleaned, maintained, labelled according to latest SANS standards, and/or prevailing site conditions. Every Distribution board for domestic, and power circuits shall be affixed with an inspection sheet on inner door, Labelled 'Earth leakage Register' and shall be current at all times as prescribed in SANS 10142- "wiring of premises".
- i) Ensure after all services has been executed, all access and emergency exit doors are locked and operation of such doors and locks is in safe, reliable working condition. If the doors' locking mechanism is defective, inform the Service manager immediately, and generate a notification at Works Management department on SAP system for civil repairs;
- j) Ensure that all access and emergency escape routes are clearly demarcated and kept clear of any obstruction, this shall be maintained, and rectified immediately
- k) All notifications on the electrical and civil infrastructure are created, scheduled on SAP, and work executed to ensure compliance;
- l) Maintain a durable, neat and professional appearance of doors, floors, walls, and ceilings by repairing and painting as and when required this is executed by Civils contract; where an instruction is issued by the Service manager to bring repairs into effect, it will form part of the price List
- m) Ensure demarcation of panels and electrical infrastructure and compliance to "Arc flash boundaries" as per site engineering specification. The Service Provider ensures the installation and upkeep of "back access barriers" to enforce limited access to back of Switchgear panels.

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- n) The Service Provider shall attach and maintain the “Arc Flash Boundary” stickers on all Switchgear panels. This sticker is obtained from Electrical Engineering Department, who has the correct designs. The Service Provider shall at request of the Service manager, have such labels made according to the design. This will form part of the Price List
- o) The Service Provider ensures and puts measures in to place, as to keep the area clean and free of dust;
- p) All repairs/alterations that involve modifications shall be approved through the Grootvlei Change Management process via the Electrical Engineering department to conform to latest Legal, and Eskom requirement and specifications prevailing at the site;
- q) Ensure that all required safety signs and notices is available, and are applied to substations and maintained to the requirements stated in this document;
- r) Standard Electrical Safety Signs and notices will form part of the Price List
- s) Notices and Signs shall at all times be affixed at Substations, any faded and missing Notices and Signs shall be replaced. The Service Provider shall note such a defect and replace it. Notices and signs shall form part of the Price List.
- t) Ensure that all safety equipment required (i.e. fire extinguishers) at the substation or in the substation are available or made available (by the employer) ,inspected at required intervals and placed in demarcated areas;
- u) Ensure and enforce the use of required safety equipment and personal protective equipment when entering the substations, as per Eskom minimum requirement;
- v) Arc Flash overalls are manufactured at a Specific Standard, and to ensure Compliance, the Employer shall provide such overall to the Service Provider. There is no cost element for Arc Flash overalls.

4.3.2.3 Low Voltage Power Systems and Distribution Cubicles

The Service Provider manages, inspects and maintains on a monthly basis all Grootvlei electrical Distribution boards installed in the Plant, offices and buildings, and to ensure that all installations comply and conform to Legislation, and SANS wiring codes of practice, whether listed or not;

- a) All low Voltage distribution boards are inspected, cleaned, maintained, labelled according to latest SANS standards, and/or prevailing site conditions;
- b) A durable, neat and professional appearance of distribution boards and sub cubicles are maintained by replacing or repairing and painting as and when required; all face plates and black plates shall be available, and doors shall be lockable with the required hinges and locking mechanisms, conforming to SANS 10142 and SANS Switchgear installations up to including 10KA.
- c) IP Ratings as prescribed in SANS 10142 shall be maintained at all times, deficiencies shall be rectified.
- d) Demarcation and labelling of panels shall be done to ensure compliance to “Arc flash boundaries” as per site engineering specification.
- e) Ensuring all installations conform to requirements of hazardous zone classification “Electrical Installations in explosive Atmospheres”.
- f) Ensuring that all safety covers and locking devices are affixed.
- g) Testing of all safety devices and Earth leakage units within or feeding from the Distribution boards with approved test equipment to the latest legal, and Eskom Standards.
- h) Ensures that the equipment is tested on regular intervals as legally specified in the Standards.

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- i) Immediately replaces any circuit breaker or Earth leakage unit, with a comparable unit when it becomes apparent that such equipment is defective.
- j) Maintains a register of each Distribution board wherein all data of tested or replaced devices are tabled. The register will be affixed inside the panel door of the Distribution Board.
- k) All Low Voltage socket outlets are in working condition, labelled, safe and securely installed, robust and appropriate for the intended environment and application.
- l) All cabling, trunkings, cable racks and support systems are securely installed, earthed, bonded and supported to the required standards.
- m) Installed additions are as per engineering specification and engineering change process, and issue required Certification of Compliance (CoC).
- n) The Service Provider shall ensure that all Electrical Installations are audited for Compliance, rectify deficiencies, and issue Certification of Compliance (CoC).
- o) All defects noted on the electrical and civil infrastructures are reported, and notifications are created on SAP, scheduled and work executed to ensure compliance.

4.3.2.4 Lighting

Only approved lighting fixtures and illuminates shall be installed and maintained at Grootvlei Power Station. The approval is done by the Research Testing Development Department (RT&D) of Eskom Holdings. Electrical Engineering Department will approve and have the approved lists of fixtures and illuminates.

It is to be noted that certain LED fixtures might interfere with control signals, and therefore approval shall be obtained for every change request or in a new installation. The Service Provider manages, inspects and maintains on a continuous basis all Grootvlei lighting systems in the Plant, Lifts/escalators and lift shafts, Pits, Offices, Buildings, Structures, Security fencing, Access Routes, and Substations to ensure that:

- a) All areas conform to illumination level requirement as per OHSACT, Act 85 of 1993, and Environmental legislation.
- b) All lights on Grootvlei Power Station in all areas are in good working condition, and fittings, fixtures, and lenses are cleaned on regular basis.
- c) All covers, fittings and fixtures are affixed and maintained in a professional appearance.
- d) All cabling, trunkings, cable racks and support systems are securely installed, earthed, bonded and supported to the required standards.
- e) Installed additions are as per engineering specification and engineering change process, and issue required Certification.
- f) Energy Saving is promoted through the use of Eskom approved energy efficient fittings and fixtures.
- g) day-night control, and or motion detection systems on substations and out buildings light circuits is installed and maintained without impairing on health and safety of people.
- h) All installations conform to requirements of "Electrical Installations in Explosive Atmospheres" and to the hazardous zone classification documentation for Grootvlei where so applicable.

Lighting installations shall be taken to include but not limited to:

- i) Solar lighting systems.
- j) LED systems.
- k) High pressure sodium and mercury systems.

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- l) Fluorescent lighting.
- m) Floodlighting systems.
- n) DC standby lighting systems.
- o) Battery back-up fixtures in AC systems.

4.4 STATUTORY TESTING OF ASSETS, PLANT, EQUIPMENT AND EARTH LEAKAGE RELAYS

Statutory Plant and Equipment refers to any plant safety or protection device and any plant, structure, item or equipment referred to in the OHS Act "Regulations," and for which there is a specific technical action and/or inspection periodicity.

Wherever applicable to Electrical Plant, the relevant statutory regulations apply, based on the requirements of the Occupational Health and Safety Act No 85 of 1993. The Service Provider ensures that all the Statutory Maintenance requirements are being managed and maintained accordingly.

The Service Provider adheres to, maintains the assets, Plant, Equipment and registers for all portable electrical equipment of the Employer to ensure that:

- a) Statutory inspection and testing intervals of assets as per legal requirement is carried out.
- b) The asset registers are current.
- c) Repairing of defective equipment to its original designed state.
- d) Appointments of competent persons is in writing.
- e) Affected parties are notified before testing commences.
- f) Scrapping of unsafe equipment done through the Asset Management department.
- g) Replacing of any safety device, plant item, and circuit breaker or Earth leakage unit, or Safety device is with a comparable unit when it becomes apparent that such equipment is defective.

4.4.1 Maintenance on 6,6kV Boards and Switchgear

The Service Provider inspects and maintains all Grootvlei Electrical Switchgear according to OEM specifications and documentation, and in line with all statutory regulations.

Maintenance of Switchgear will be executed during "Routine Maintenance", "Opportunity Maintenance", "General Outage", or where an Emergency Breakdown has occurred, and the total Electrical board requires shutting down and repairs under emergency circumstances.

NOTE: The following conditions are NON-NEGOTIABLE:

Under no circumstances will it be allowed by the Employer that, when work is executed, fixtures and fasteners are removed, panels opened, wires disconnected, without the Service Provider having met the following conditions, which are non-negotiable:

- a) Every panel's items will be bagged, tagged, and kept to the specific tier of the panel.
- b) No tier/panel equipment's, fasteners, bolts, and nuts will be mixed or interchanged with another tier on the same Switchgear panel.
- c) Every piece or item removed, replaced, or used will be accounted for. For this purpose the Service Provider shall have check sheets logging all items to the specific panel and tier.
- d) On completion of a task, no removed items shall not have been replaced, or be misplaced, or be unaccounted for.
- e) Good Housekeeping principles shall be observed at all times.

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- f) The Service Provider shall have an up-to-date register of all tools used and available at the worksite.
- g) The tool register shall be monitored and continually updated by the person in charge of the worksite.
- h) All tools and equipment signed in to the workplace, shall at the completion of the work, be signed out and accounted for. Any tool not being accounted for shall require the works to be inspected, until such missing piece is accounted for.

4.4.2 Routine Maintenance Requirements: Switchgear

The Service Provider shall make use of the SAP system, and attend to Notifications as per arrangement with Works Management process. The service Provider will carry out inspections on the externals of the Switchgear panels, and observe any defects visually, and execute repairs to these defects. The following is required, but not limited to:

- a) Ensure the Safety of personnel entering the Switchgear Substation.
- b) Wearing the correct Personal Protective Equipment (PPE).
- c) All surroundings to the Switchgear Panels and electrical equipment are kept clean, and dry.
- d) Ensuring that the Switchgear Substation is clean, and free from debris. Arrange and action the Cleaning interventions with others.
- e) All KKS coding and Labelling is according to drawings, and all items are labelled accordingly. Defects are noted, repaired with immediate effect.
- f) All indication LED's for circuit-breaker position is tested and replaced if defective.
- g) All panels and covers are inspected to ensure it's completely closed, fastened, secure, and locked to ensure "ARC flash" type testing compliance. Any defect will be logged into SAP, and repaired.
- h) Replace any cracked or broken "Vision panels", and Relay covers.
- i) Ensure all Ammeters and Voltmeters are operative, notifications to be raised on SAP for investigation, testing and repair.
- j) Inspection of main station Earthing system on the Switchgear panels.
- k) All Safety Signs, Arc Flash Boundary Stickers, and Notices regarding the Switchgear are affixed to the boards as per Site requirement.
- l) Ensure that there is Barriers installed at the REAR of Switchgear in order to Limited access to this area;
- m) Investigate individual faulted circuits, on request of Grootvlei OPS department. Inspect and test individual Contactor and Circuit-breaker circuits when it fails to Rack in and Rack out, fails to Trip or Close a circuit, and take the necessary actions to rectify, abiding by the Site Regulations, especially the required *Permit To Work* (PTW) systems.
- n) Exchange individual Contactors, and Circuit-breakers which are proven to have failed. Follow Site process to withdraw and return failed and faulty items to the Eskom Warehouse/stores.
- o) Exchange auxiliary faulted equipment such as Fuses, Relays.
- p) Give access to others with regards to work to be executed in Switchgear Substation.
- q) Touch up of paintwork are done on panels with minimum thickness of 40-50µm;
- r) All routine inspection and repair will be executed in line with the OEM specifications.

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4.4.3 Opportunity maintenance Requirements: Switchgear

The Service Provider shall make use of the SAP system, and attend to Notifications as per arrangement with Works Management process.

The Service Provider will carry out inspections on the internals and externals of the Switchgear panels, and observe any defects and execute repairs to these defects.

For executing Opportunity Repairs, the Service Provider shall prepare a "Program with a detailed Scope of Work", listing the observed Defects which require repair, and which could not have been legally executed on Routine repairs, due to limitations, or dangers involved with the Switchgear being ALIVE.

The Service Provider shall make a request for Switchgear Maintenance to the Employer, submitting the detailed Program, with interventions and durations for each Task.

The following is required, but not limited to:

- a) Repairs of main and control circuitry.
- b) Testing and repair of Breakers and Contactors.
- c) Testing of interlock positions on all breakers, Contactors, and Individual Tiers.
- d) Verifying the tightness of electrical connections on control wiring.
- e) Verifying the tightness of electrical connections of power circuit cables and verifying the torque settings.
- f) Faulty Breakers and Contactors are replaced. Exchange individual Contactors, and Circuit-breakers which are proven to have failed. Follow Site process to withdraw and return failed and faulty items to the Eskom Warehouse/stores.
- g) Inspection and repairs of Earth Switch devices are done.
- h) Lubrication of moveable parts as per OEM guidelines is executed.
- i) Replacement of any worn parts is done.
- j) Repairs to "Castle key" lock-out systems is done
- k) Cleaning of breaker compartment.
- l) Cleaning of Control Circuits (relay) compartment.
- m) Cleaning of Breakers and Contactors, and lubricating contact tulips.
- n) The repair of any other identified Defect that might impair the correct functioning of any component in connection with the Switchgear being worked on.
- o) On any Plant or item where the Service Provider fails to rectify or execute the services, the Service Provider shall arrange with the OEM (Equipment Manufacturer) to repair such deficiency. The Employer shall only assess the amounts the Employer directly acquired from the OEM. The Service Provider pays the Employer.

4.4.4 General Outage, Mini Outage (GO) Requirements: Switchgear

The Service Provider shall make use of the SAP system, and attend to Notifications as per arrangement with Works Management process.

The Service Provider manages and maintains the Switchgear scheduled for the Outage by adhering to all Legal, Site Regulations, Policies, standards, and Procedures when executing work under Outages.

The Service Provider ensures that he/she does not unnecessarily keep Switchgear Plant on the PTW system, in order to assist in the prevention of Cable theft.

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To this end, the Service Provider ensures that:

4.4.4.1 General requirements

The following general requirements are adhered to:

- a) The Service Provider provides resources to the Employer's Outage department for execution of the Services.
- b) The Service Provider attends to all the Outage meetings as Scheduled by the Outage department, and represents the Employer.
- c) The Service Provider attends all scheduled Planning meetings, and schedules the work according to the Outage Schedule.
- d) The Service Providers do not cause delays.
- e) The Service Provider follows the due processes to remove faulty equipment, and requests new equipment from the Outage department, which will be issued from Grootvlei stores.
- f) The Service Provider plans the services in such manner as to minimize any delays and overtime.
- g) The Service Provider submits the Outage Plan, with the detailed Engineering Scope of Work for the services to be executed.
- h) The Service Provider drafts an ITP (Inspection and Test Plan) for each Activity included in the Work, detailing the interventions or tasks, with the required signatories.
- i) The Service Provider gets Engineering ITP approval before Works commence.
- j) The Service Provider notifies the Quality department, the Employer, and the Client (Engineering) of all Witness, and Hold points that need to be signed off, before he carries on with the work.
- k) The Service Provider immediately rectifies all deficiencies and discrepancies noted in the ITP.
- l) The Service Provider executes all work as detailed in the Engineering Scope of Work.
- m) The Service Provider provides all means to execute the services.
- n) The Service Provider strips down electrical plant, cleans, inspects, repairs, replaces, and rebuilds the plant to its original state in which it can perform its designed functions.
- o) The Service Provider shall not interfere with, or make changes to any apparatus, unless specifically instructed to do so by the appointed Eskom representative, in writing.
- p) The Service Provider makes use of the OEM (Original Equipment Manufacturer) Specifications and Requirements to restore plant and equipment to its original state.
- q) As far as reasonably practicable, the Service Provider ensures that a "Clean Condition Area" is maintained during the execution of services, whereby he will be able to account at all times, for all equipment, and tools used in the area where the service is executed. Refer to the non-negotiable conditions for Switchgear maintenance in Section 4.4.1.
- r) No interchanging of panels, segregations, fixtures, or items stripped-down on Electrical Switchgear, unless specifically instructed to do so by the appointed Eskom representative, in writing. Wherever possible, items will be marked and replaced in their original positions. Every item or fixture removed will be kept in an allocated container for the panel.
- s) Any missing or stripped fixture or fitting will be replaced.
- t) The employees of the Service Provider shall not maliciously damage any part or component in the plant, and greatest care shall be exercised in the execution of their duties.

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- u) All equipment, parts, or spares removed or stripped down from the works shall be counted, listed, bagged, tagged, stored, and signed into, and signed out of, a predetermined outage storage area. It will be the responsibility of the Service Provider to account for each item of the service. The Service Provider shall have check sheets, and registers updated at all times to assist in this regard. Refer to the non-negotiable conditions for Switchgear maintenance in Section 4.4.1.
- v) The Service Provider arranges with Works Management Department to supply him/her with the necessary SAP documentation (PM's and WO's). The Service Provider completes the service information in full, for historical and tracking purposes.
- w) The Service Provider signs off the Works Orders, detailing the condition of the Plant as found, the status after repairs, and the activities carried out to the plant to restore it to a state in which it can perform its required functions.
- x) The Service Provider compiles a detailed Outage report to the Employer, for all the activities covered in an outage and keep records (filed).
- y) The Service Provider keeps Certificates, test sheets, inspection reports available, and attached in the report.

4.4.4.2 Technical Requirements

The Service Provider carries out the following:

- a) Ensures the Safety of personnel entering the Switchgear Substation, wearing the correct Personal Protective Equipment (PPE), and cleaning all surroundings to the Switchgear Panels and electrical equipment, ensuring that Switchgear Rooms and Substations are clean, and free from debris, arranging and carrying out the cleaning interventions with others.
- b) All Safety Signs, Arc Flash Boundary Stickers, and Notices regarding the Switchgear are affixed to the boards as per Site requirement. Ensure that there is Barriers installed at the REAR of Switchgear in order to Limited access to this area.
- c) Ensures that all KKS coding and labelling is according to drawings, and that all items are labelled accordingly. Defects are noted and repaired with immediate effect.
- d) Inspection, testing of main station Earthing system on the Switchgear panels, repairing where necessary. Inspects and repairs Earth Switch devices.
- e) Verifying the tightness of electrical connections on control wiring, tightness of electrical connections of power circuit cables and verifying the torque settings.
- f) Indication LEDs for circuit-breaker positions are tested and replaced if defective. All panels and covers are inspected to ensure it can completely close, fastened, secure, and locked to ensure "ARC flash" type testing compliance. Ensures all Ammeters and Voltmeters are operative, tested and repaired where necessary, replacing any cracked or broken "Vision panels" and Relay covers.
- g) Investigate individual faulted circuits and give access to others with regards to work to be executed in Switchgear Substation. Testing of interlock positions on all breakers, Contactors, and Individual Tiers, repairs of main and control circuitry, testing and repair of Breakers and Contactors. Faulty Breakers and Contactors are replaced. Exchange individual Contactors, and Circuit-breakers which are proven to have failed.
- h) Removes all MV Breakers and Contactors during the start of the General Outage, assesses the condition, and determines whether it should be serviced only, and/or be repaired at the OEM factory, following due processes to remove faulty equipment, and requesting new equipment from the Outage Department, which will be issued from Grootvlei stores.
- i) Follows Site process to withdraw and return failed and faulty items to the Eskom Warehouse/stores.

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- j) Cleaning of all Switchgear Panels, cleaning of Control Circuits (relay) compartments, cleaning of Breakers and Contactors and lubricating contact tulips..
- k) Lubricates moveable parts as per OEM guidelines. Replaces any worn parts.
- l) Repairs “Castle key” lock-out systems.
- m) Repairs any other identified Defect that might impair the correct functioning of any component in connection with the Switchgear being worked on.
- n) Touch up of paintwork are done on panels with minimum thickness of 40-50µm;

On any Plant or item where the Service Provider fails to rectify or execute the services, the Service Provider shall arrange with the OEM to repair such deficiency.

- o) The Employer shall only assess the amounts the Employer directly acquired from the OEM.
- p) The Service Provider pays the Employer.
- q) The Service Provider manages the access and permits on behalf of the Employer on plant under his/her control.
- r) The Service Provider hands over the Plant to the Employer, ensuring that the plant will function to its desired designed state.

4.4.5 Maintenance on 380V AC Boards and Switchgear

The Service Provider inspects and maintains all Grootvlei Electrical Switchgear according to OEM specifications and documentation, and in line with all statutory regulations. Service Provider attends to all protection equipment and relays in 380V AC boards excluding main incomer, which is done by others.

Maintenance of Switchgear will be executed during “Routine Maintenance”, “Opportunity Maintenance”, “General Outage”, or where an Emergency Breakdown has occurred, and the total Electrical board requires shutting down and repairs under emergency circumstances.

While maintaining electrical Switchgear at Grootvlei, the Service Provider ensures that the following is done on a monthly basis:

- a) All KKS coding and Labelling is according to drawings, and all items are labelled accordingly. Defects are noted, repaired with immediate effect.
- b) All indication LED’s for circuit-breaker position is tested and replaced if defective.
- c) All panels and covers are inspected to ensure it can completely close, fastened, secure, and locked to ensure “ARC flash” type testing compliance. Any defect will be repaired.
- d) Replace any cracked or broken “Vision panels”, and Relay covers.
- e) Ensure all Ammeters and Voltmeters are operative, test and repair.
- f) Inspection, testing of main station Earthing system on the Switchgear panels, and repair.
- g) All Safety Signs, Arc Flash Boundary Stickers, and Notices regarding the Switchgear are affixed to the boards as per Site requirement.
- h) Repairs of main and control circuitry is done during breakdown.
- i) Testing and repair of circuits is done during abnormal conditions.
- j) Faulty components are replaced on one to one basis.
- k) Lubrication of moveable parts are executed as per OEM guidelines.
- l) Touch up of paintwork on panels is done.

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- m) Replacement of any worn and defective parts is done.
- n) Planning and execution of maintenance on non-unitised boards are done.
- o) All routine inspection and repair, carried out in line with OEM specifications.

4.4.6 Outage Requirements

4.4.6.1 General Requirements

During outages, the Service Provider carries out the following:

- a) Manages and maintains the Switchgear scheduled for the Overhaul or Outage by adhering to all Legal, Site Regulations, Policies, standards, and Procedures when executing work under Outages.
- b) Ensures that he/she does not unnecessarily keep Switchgear Plant on the PTW system, in order to assist in the prevention of cable theft.
- c) Provides resources to the Employer's Outage department for execution of the Services.
- d) Attends all the Outage meetings as Scheduled by the Outage department, and represents the Employer.
- e) Attends all scheduled Planning meetings, and schedules the work according to the Outage Schedule.
- f) Does not cause delays.
- g) Follows due processes to remove faulty equipment, and request new equipment from the Outage department, which will be issued from Grootvlei stores.
- h) Plans the services in such manner as to minimize any delays and overtime.
- i) Submits the Outage Plan, with the detailed Engineering Scope of Work for the services to be executed.
- j) Drafts an ITP (Inspection and Test Plan) for each Activity, for the Work, detailing the interventions or tasks, with the required signatories.
- k) Secures Engineering approval for all the ITPs before Works commence.
- l) Notifies the Quality department, the Employer, and the Client (Engineering) of all Witness, and Hold points that needs to be signed off, before he/she carries on with the work.
- m) Immediately rectifies all deficiencies and discrepancies noted in the ITP.
- n) Executes all work as detailed in the Engineering Scope of Work.
- o) Provides all means to execute the services.
- p) Strips down plant, clean, inspects, repair, replace, and rebuild the plant to its original state to restore it to a state in which it can perform its designed functions.
- q) Does not interfere with, or make changes to any apparatus.
- r) Makes use of the OEM Specifications and Requirements to restore plant and equipment to its original state.
- s) As far as reasonably practicable, the Service Provider ensures that a "Clean Condition Area" is maintained during the execution of services, whereby he will be able to account at all times, for all equipment, and tools used in the area where the service is executed. Refer to the non-negotiable conditions for Switchgear maintenance in Section 4.4.1.

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- t) No interchanging of panels, segregations, fixtures, or items stripped-down on Electrical Switchgear. Items will be marked and replaced in its original position. Every item or fixture removed will be kept in an allocated container for the panel. Any missing or stripped fixture or fitting are replaced.
- u) The employees of the Service Provider shall not maliciously damage any part or component and greatest care shall be exercised in the execution of their duties.
- v) All equipment, parts, or spares that are removed or stripped down from the works shall be counted, listed, bagged, tagged, stored, and signed into, and signed out of, a predetermined outage storage area. It will be the responsibility of the Service Provider to account for each item of the service. The Service Provider shall have check sheets, and registers updated at all times to assist in this regard. Refer to the non-negotiable conditions for Switchgear maintenance in Section 4.4.1.
- w) The Service Provider arranges with Works Management Department to supply him/her with the necessary SAP documentation (PMs and WOs), and completes the service information in full, for historical and tracking purposes.
- x) The Service Provider signs off the Works Orders, detailing the condition of the Plant as found, the status after repairs, and the activities carried out to the plant to restore it to a state in which it can perform its required functions.
- y) The Service Provider compiles a detailed Outage report to the Employer, for all the activities covered in an outage and keeps records in an easily accessible hardcopy filing system, such as certificates, test sheets, inspection reports available, also attached in the Outage report.

4.4.6.2 Technical Requirements

To fulfil the technical requirements, the Service Provider carries out the following:

- a) Removes all LV Breakers assess the condition, and determine whether it should be serviced only, and/or be repaired at the OEM factory.
- b) Follows due processes to remove faulty equipment, and request new equipment from the Outage department, which will be issued from Grootvlei stores.
- c) Ensures the Safety of personnel entering the Switchgear Substation, wearing the correct Personal Protective Equipment (PPE).
- d) Ensures that the Switchgear Substation, all surroundings to the Switchgear Panels and electrical equipment, is clean, dry and free from debris. The Service Provider arranges and carries out the Cleaning interventions with others.
- e) Ensures that all KKS coding and Labelling is according to drawings, and all items are labelled accordingly. Defects are noted, repaired with immediate effect.
- f) All indication LEDs are tested and replaced if defective.
- g) All panels and covers are inspected to ensure it can completely close, fastened, secure, and locked to ensure "ARC flash" type testing compliance. Any defect will be repaired.
- h) Replace any cracked or broken "Vision panels" and covers.
- i) Ensure all Ammeters and Voltmeters are operative, tested and repaired where necessary.
- j) Inspection, testing of main station Earthing system on the Switchgear panels, and repair.
- k) All Safety Signs, Arc Flash Boundary Stickers, and Notices regarding the Switchgear are affixed to the boards as per Site requirement.
- l) Investigate individual faulted circuits.
- m) Give access to others with regards to work to be executed in Switchgear Substation.

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- n) Touch up of paintwork are done on panels with minimum thickness of 40-50µm;
- o) Repairs of main and control circuitry is done.
- p) Testing and repair of Breakers and individual circuits to motor feeders.
- q) Verifying the tightness of electrical connections on control wiring.
- r) Verifying the tightness of electrical connections of power circuit cables and verifying the torque settings on busbars.
- s) Faulty Breakers and Contactors are replaced. Exchange individual Contactors, and Circuit-breakers which are proven to have failed.
- t) Follows Site process to withdraw and return failed and faulty items to the Eskom Warehouse/stores.
- u) Inspects and repairs Earth Switch devices.
- v) Lubricates moveable parts as per OEM guidelines.
- w) Replaces any worn parts.
- x) Cleaning of all the Switchgear Panels.
- y) The Service Provider manages the access and permits on behalf of the Employer on plant under his/her control.
- z) The Service Provider hands over the Plant to the Employer, ensuring that the plant will function to its desired designed state.

4.4.7 Maintenance on LV (DC) Switchgear (Unitised) and Diesel Generator

The purpose of the existing 220VDC boards are only for DC back up when the AC power to the 380V Essential Board fails.

As per requirements stated in this document, the Service Provider carries out all maintenance as required for full functional operation as per OEM requirements, as and when outages allow.

The Service Provider also ensures that the diesel generator is fully functional, confirming this on a weekly basis with the Ops Department and immediately servicing the diesel generator when required, as per OEM requirements, with further details included in Section 4.4.15.

4.4.8 Maintenance on Transformers

4.4.8.1 Large Power Transformer (≥ 2MVA)

The Service Provider manages, inspects and maintains all large Grootvlei transformers on a monthly basis according to referenced standards and Grootvlei specific maintenance procedures. The Service Provider carries out the following:

- a) Arranges for, issues, and maintains PTW and supervises the operations executed on transformers, and gives access to others in connection with work on transformers.
- b) Inspects for all the required Notices, safety signs, and required labels on the transformers, and bays, PCB labels, to be attached, visible, and in good order. Develops an Inspection sheet, to be used to inspect and note any deviations.
- c) Transformer bays are inspected and maintained by ensuring a neat and professional appearance through cleaning and sweeping the bay areas, removing any vegetation growth. Enclosures, and wire fences of the bays are maintained, deviations observed must be logged and notifications must be raised on SAP system.

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- d) Inspection of oil levels in conservator tanks are done, deviations noted, arranging for oil top-up. Inspection for oil leaks and clean up leaks, arranging for repairs to be executed. Arranges access for oil top up on large transformers. Arranges access for oil samplers on all transformers.
- e) Installs temporarily supplies, and temporarily lights to transformer bays, certifying the installations for the use of Mobile oil purification and outage work.
- f) Inspects and maintains breathers, breather seals and gaskets, replaces silica gel when more than 30% discolouration is evident, using only Eskom approved type silica gel. Inspects oil level in breather oil seal bowl, topping up or replacing oil when required. Assists with oil sampling, arranging access for any other parties.
- g) Inspects and cleans Bushings, noting all defects, and carrying out repairs as per maintenance strategy. Inspects Earthing, repairing Earthing defects and testing for Earthing continuity.
- h) Inspects transformer paintwork, maintaining or touching up.
- i) Inspects, tests and maintains electrical circuits of cooling fans and oil pumps. Inspects and maintains Oil Flow Indicators to cooler radiators. Maintains oil cooler radiators by ensuring free airflow, preventing blockages, removing and cleaning debris from the coolers.
- j) Removes and installs electrical motors which have failed. Visually inspects and maintains instrumentation, relays, wiring and looms for obvious damage and cleanliness.
- k) Inspects and maintains Marshalling kiosks and junction boxes to ensure that the door seals are intact, doors are fit for purpose, windows are clean, door locks are operative, Earthing is effective and enclosure stays vermin proof.
- l) Ensures kiosk lights are operative and limit switches working.
- m) Inspects all wiring of all Power and Control circuits, and ensures that tight and correct connections in marshalling kiosks are maintained for field instrumentation and equipment.
- n) Ensures that Oil temperature and Winding temperature indicators are correctly labelled and operative. Ensures that Oil temperature and Winding temperature indicators are set to correct alarm and trip levels, as provided by Protection Service Provider onsite (currently PTM).
- o) Inspects and maintains pipe work, valves, nozzles and rupturing bulbs on Fire deluge system, working with others so that system is maintained in good condition with no leaks.
- p) Ensures that all valves on the transformer are in correct "In Service" operating positions, especially on oil breathers, Buchholtz relays and conservator tanks.
- q) Replaces any defective or worn auxiliary equipment, such as contactors, overload relays, control and power wiring.
- r) Disconnecting and reconnecting of all HV, MV, and LV, and Control cabling and wiring. Disconnecting and reconnecting main transformer busbar flexibles and connections. Maintaining busbar ducting cleanliness, connections, and air pressurization systems.
- s) First line maintenance of external interfaces of Kelman/Serveron online transformer gas analysers, including supplies, loose connections and pipe work.
- t) Reporting and repairing any other defects observed during routine maintenance.

This document will further prescribe what maintenance tasks need to be done based on the criticality of the equipment. The scope excludes fire protection system operating and maintenance and electrical protection engineering and design.

The Service Provider refers to the following documents when carrying out maintenance on transformers:

- a) OEM maintenance manuals.

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- b) GGPP1344: Control of Works Performed on Transformers.
- c) GGS0178: Maintenance of Power Transformers.
- d) GGS0828: Clean Conditions for Power Transformers.
- e) GGG0994: Transformers Hand Condition Monitoring Guideline.
- f) GGS1026: Sampling and testing of mineral insulating oil.
- g) 32-406: Mineral Insulating Oils (Uninhibited and Inhibited), Part 1

4.4.8.2 Small Power Transformers/Auxiliary transformers

The Service Provider manages, inspects and maintains all small Grootvlei transformers according to referenced standards and maintenance procedures. The Service Provider carries out the following:

- a) Arranging for, issuing, and maintaining PTW and supervising the operations executed on transformers.
- b) Giving access to others in connection with work on transformers.
- c) Inspecting for all the required Notices, safety signs, and required labels on the transformers, and bays, PCB labels, to be attached, visible, and in good order.
- d) Inspection and maintenance of Transformer bays, ensuring a neat and professional appearance through cleaning and sweeping the bay areas, removing any vegetation growth.
- e) Maintenance of enclosures, and wire fences of the bays, with observed deviations logged and notifications raised on SAP system.
- f) Inspecting of oil levels in conservator tanks, with deviations noted, arranging for oil top-up when required.
- g) Do inspections for oil leaks and clean up leaks, arranging for repairs to be executed.
- h) Supply of top-up oil in 20 Litre containers, including certification, as per Eskom oil specification for top-up requirements on auxiliary transformers.
- i) Inspection and maintenance of breathers, breather seals and gaskets, replacing of silica gel when more than 30% discolouration is evident, using only Eskom approved type silica gel.
- j) Inspecting oil level in breather oil seal bowl, topping up or replacing oil as and when required.
- k) Inspecting and cleaning Bushings, noting all defects and repairing as per maintenance strategy.
- l) Inspecting Earthing, repairing Earthing defects and testing for Earthing continuity.
- m) Inspecting transformer paintwork and maintaining or touching-up.
- n) Assisting with oil sampling.
- o) Arranging access for any other parties.
- p) Disconnection and reconnection of all HV, MV, LV and Control cabling and wiring.

4.4.9 Earthing and Station Earth Mat

The Employer submits drawings to Service Provider detailing earth mat reference points. These reference points are to be marked and clearly identified on the plant. The Service Provider manages, inspects and maintains on a monthly, quarterly and annual basis all Grootvlei Earthing to ensure that:

- a) Earthing complies with relevant Eskom and statutory standards.
- b) Visual inspections are carried out on all plant systems to ensure the integrity of the Earthing system.

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- c) Visual inspections are carried out on cable racking to ensure the integrity of the earthing system.
- d) Correct bonding and earthing practices are maintained, and all bolted earthing systems are clean and making a tight connection.
- e) Reporting any defective earthing system, or missing earthing system to the Employer for immediate replacement.
- f) A detailed (including missing and/or loose connections etc.) quarterly visual inspection report is generated.
- g) Access is obtained to test integrity of the Earthing system as per Employer instructions and prevailing site regulations.

4.4.10 Hazardous Location (HAZLOC) Installations

The Service Provider manages, inspects and maintains on a continuous basis all Grootvlei installations to ensure statutory compliance to the Occupational Health and Safety Act 85 of 1993, which requires that:

- a) All electrical equipment installed in hazardous (flammable liquid/gasses and dust) areas shall comply with the minimum requirements of the relevant standards.
- b) No person may use electrical machinery in locations where there is danger of a fire or explosion owing to the presence, manufacturing, occurrence, handling or storage of flammable gas, vapours or dust, unless the areas where the flammable gas, vapours or dust are classified in accordance with SANS 0108 and the electrical equipment installed in these areas complies with the classification of the areas.
- c) Every user referred to in the above paragraph will be in possession of a certificate by an approved inspection authority stating the classification of the electrical equipment or permanent markings/plates attached on the equipment can be accepted.
- d) This certificate states that the equipment has been manufactured and tested for the hazardous articles.
- e) Where diverse machinery such as motor control centres and control apparatus are used, the selection, arrangement, installation, protection, maintenance and working thereof results in no less a degree of safety as when the equipment was used separately.
- f) No adjustments shall be made to machinery in hazardous areas unless the equipment is rendered dead.
- g) Where there is a possibility of static built-up under working conditions, the user shall ensure that all electrical equipment and all metal parts are earthed in such a way that all static built-up will be conveyed to the earth mass effectively.

Annual inspections are carried out on all equipment operational in such areas, with evidence of such inspections used to confirm and support any plant CoCs. Where such certification is not available, the Service Provider ensures compliance and issues the required CoC certification.

The Service Provider employ a "Master Installation Electrician" on full-time basis to comply with and enforce the requirements of the Act. The Service Provider shall, in concurrence with Electrical Engineering, make assessments and determine classification or re-classification on behalf of the Employer. Only employees authorised and certified to work on equipment in hazardous areas shall be permitted to work on such installations.

4.4.11 Cabling

The Service Provider manages, inspects and maintains on a continuous basis:

- a) All cabling with a voltage above and including 220V AC and 220V DC

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- b) Testing of LV cabling.
- c) Disconnecting and reconnecting of cables on “dead-end feeders” on High Voltage and Low Voltage systems.
- d) Disconnecting and reconnecting Auxiliary Plant transformers.
- e) Disconnecting and reconnecting of general power cables.
- f) Confirmation of rotation direction on HV and LV motors, changing direction where required.
- g) Informing the Employer of cabling that is damaged beyond repair, which requires replacement.
- h) Inspection and repair of loose connections and torque checking, relative to approved tables.
- i) Inspecting and maintaining of cable number and identification tags.
- j) Installation and certification of temporary supplies on Low Voltage systems, as per instruction of the Employer.

4.4.12 Medium Voltage and Direct Current Motors

The Service Provider manages, inspects and maintains on a continuous basis all Grootvlei motor installations, to ensure compliance through:

- a) Electrical disconnection and reconnection of motors for testing and replacement.
- b) Unbolting of and removal of small motors from base or structure where no mechanical intervention is required to undo a coupling, i.e. small geared, flanged mounted and motors which do not require rigging, with a weight of 30kg and less.
- c) Direction testing of motors in concurrence with the Site regulations.
- d) Routine inspections on motor terminal boxes and star points where redundant systems are available.
- e) Routine inspections on the earthing of the motors, glanding, and cable connections and entry into the termination boxes.
- f) Routine inspections and reporting on motors installed in Hazardous areas, as per the Site Specific Instructions related to those areas.
- g) Opportunity based maintenance on electrical motors, including opening of terminal boxes, checking soundness of connections, and cleaning.
- h) Testing of Low Voltage, Medium Voltage and Direct Current motors and motor cabling.

NOTE: Each motor tested will be accompanied with a full “Motor Report and Test sheet”, outlining causes, modes of failure and test results. This is an electrical and mechanical overview of the mode of failure of the motor and findings related to the failure.

Such test report shall be submitted to:

- i) Employer during the same shift.
- j) First line investigation and reporting on motors, including electrical and mechanical motor failure.
- k) Inspection and maintenance of motor earthing systems.
- l) Motor space heater connections, maintenance, and testing.
- m) Periodical electrical testing of spare motors as per storage procedures.

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4.4.13 Generator and Auxiliary Systems

Using Grootvlei specific maintenance procedures as reference, the Service Provider manages, inspects and maintains on a continuous basis:

4.4.13.1 Generator Brushgear and associated equipment

- a) Brush gear on the generator slip ring, checking condition of brushes, brush holders and adheres to intervals at which brushes need to be replaced.
- b) Changing of slip ring brushes on load, in line with prevailing site conditions and requirements.
- c) Commutator rotor and stationary parts, power and control cabling of the Exciter system.
- d) Disconnection and reconnection of the system.
- e) Cleaning of oil contaminants on the brush gear system, generator gearbox, exciter pedestal and slip ring pedestal to prevent earth fault paths.
- f) Inspection and cleaning of stator choke chambers.

The Service Provider tests the earth insulation on the generator bearing pedestals, and gearboxes, as per the Engineering test sheets and specifications. Test reports shall be submitted to Engineering department for decision-making and investigation.

To this end, the Service Provider shall have the required Analogue testing equipment to measure Insulation and Voltage values for the following:

- g) Voltage and Current Monitoring system maintenance.
- h) Earth and voltage brush inspection and brush replacement.
- i) Replacements of worn parts i.e. filters, brushes, covers.
- j) Earthing inspection and maintenance.
- k) Cleaning, maintenance, and repairs of inline surge transformers.
- l) Cleaning of surge arrestor chamber and inspecting connections.
- m) Maintenance, inspection, testing and replacement of duct chokes.
- n) Cleaning, maintenance of Busbar ducts and its compressed air systems.
- o) Disconnecting, Testing, Repair and Reinstating Generator main Conductors, flexible Connectors, Insulators, Covers and respective rubber seals.

4.4.13.2 Static Excitation Transformers (OFF-LOAD ONLY)

The Service Provider manages, inspects and maintains electrical installations to ensure compliance for the following:

- a) Cleaning of the transformer when the unit is off load.
- b) Inspection of earthing systems.
- c) Inspection and torque check of links and connection positions.
- d) Inspection and cleaning of transformer cubicle, signage, and other electrical devices.
- e) Changeover of bridge pieces from test supply to machine bar supply, as required.

4.4.13.2.1 Converter Panels

The Service Provider carries out the following:

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- a) Cleaning of the system panels.
- b) Inspection of earthing systems.
- c) Inspection and cleaning of cubicles, signage, and other electrical devices.
- d) Checking connections.
- e) Cleaning of Filters.

NOTE: Unit will trip if converter panel doors are opened during machine on-load conditions.

4.4.13.2.2 Air conditioner units

The Service Provider inspects air conditioner units for excitation systems, with these systems repaired and maintained by others.

4.4.13.3 Generator Circuit Breaker

The Service Provider carries out general maintenance on the Generator Circuit Breaker, under the guidance of Eskom Specialist services.

Generator Circuit Breaker protection functionality testing, including close coils and trips coils, are carried out by others.

4.4.13.4 Generator Isolated Phase busbar system

The main Bus bars from the Main Generator are internally enclosed in metal ductings, with each phase individually enclosed in ducting, from the Main Machine terminals, up to the Main Generator Transformer Primary (LV) Connections.

These ductings are provided with Control Air, via an electrical control unit, which maintains a positive pressure (just above Atmospheric) inside the Ductings, to ensure that dust does not settle inside the ductings.

The busbar pressurisation system provides a continuous positive pressure to the three independent ducts that run from the Generator to the Generator transformer, controlled through an Electrical control panel. Flexible connections for the Generator Star point, Line side, and transformer flexible connections are situated inside the bushing chamber and busbar ducting, situated below the generator.

The Service Provider manages, inspects and maintains:

- a) Electrical control system associated with busbar pressurisation system.
- b) Ensures that the system maintains a positive pressure.
- c) Seals the ducting covers to prevent air leaks or dust ingress during unit outages.
- d) Searches for and repairs any air leaks on the ducting systems prior to the unit being on load.
- e) Disconnects and reconnects Line and Star point flexible links.
- f) Checks and maintains earthing of the generator and subsystems.
- g) Cleans the busbar ducting.
- h) Removes and replaces generator and transformer side ducting covers.
- i) Replaces any defective holding down bolts, clamps and damaged seals on ducting covers.
- j) Cleaning of busbar duct insulators
- k) Maintenance of busbar air pressurising system, and air supply lines.

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4.4.13.5 VT room equipment

The Service Provider manages, inspects, cleans and maintains:

- a) VT room, with cleaning of its cubicles and the VTs.
- b) Air lines for leaks within the VT cubicles.
- c) Loading resistor cubicles.
- d) Connections on main and control systems.

4.4.14 Diesel generators

The Service Provider manages, inspects and maintains:

- a) Maintenance of electrical systems and components on diesel generators, excluding battery chargers, PLCs and batteries.
- b) Fault finding and replacement of electrical components on diesel generators.
- c) Maintenance, cleaning and testing of diesel generators.
- d) Disconnection and reconnections of diesel generators for testing or replacement purposes.
- e) Brush maintenance where applicable, as per OEM requirements.
- f) Maintenance of contactors and starter panels.

4.4.15 Motors

The Service Provider manages, inspects and maintains all Grootvlei motors on a continuous basis:

- a) Disconnection and reconnection of motors for testing and replacement.
- b) Direction testing of motors in concurrence with the Site regulations.
- c) Routine inspections on motor terminal boxes.
- d) Opportunity based maintenance on electrical motors, including opening of terminal boxes, checking of connections, and cleaning.
- e) Brush inspection and replacement.
- f) First line fault finding and reporting on motors, including electrical and mechanical motor failure.
- g) Inspection and maintenance of motor earthing systems.

4.4.16 Electrical actuators

The Service Provider manages, inspects and maintains on a continuous basis:

- a) Terminations on actuators situated inside the actuator termination box.
- b) Supply cabling and junction boxes.
- c) Connect and disconnect power to all actuators.
- d) Ensure supply and test direction of operation.
- e) Fault finding and repair of electrical actuators.

4.4.17 Electrical solenoids

The Service Provider carries out disconnection and reconnection of electrical changeover solenoids of hydraulic dampers and valves, including power supply cable for 220 V AC, 220 VDC or above.

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4.4.18 Coal plant, Conveyor Plant systems and Weighbridges

The Service Provider manages, inspects and maintains the integrity of electrical equipment in the Coal Plant, as per prevailing site regulations and conditions:

- a) Sump pump motors.
- b) Coal stockyard drainage and collection dam.
- c) Coal Staithes.
- d) Under-Staithes reclaiming conveyors.
- e) Terrace coal handling conveyors.
- f) Conveyor Tipper car systems.
- g) Mass Meters and Sample Hammer.
- h) Magnet Separators and Metal Detectors.
- i) Emergency trip wires.
- j) Electromagnets
- k) Emergency trip switches.
- l) 220 VAC control circuits.
- m) Power supplies to weighbridge systems.

4.4.19 Ex Property maintenance

4.4.19.1 Electrical maintenance in immediate surrounds of the station

In conjunction with others, the Service Provider manages, inspects and maintains installations to ensure compliance through:

- a) Streetlight maintenance on Power Station Road, directly outside Grootvlei Power Station.
- b) Permit applications, and supervision.
- c) Transformer maintenance as per transformer specifications.
- d) Any other Task Instruction of electrical nature as per Service Manager, by submitting quotations.

4.4.19.2 Vaal Dam Pumping Station

Grootvlei Power Station receives its main supply of water from the nearby Vaal Dam, and the Service Provider ensures that all electrical plant at the Vaal Dam Pumping Station is available to provide the water required by Grootvlei.

Power supply to the Vaal Dam Pumping Station is received from the Distribution Network via two 88/3.3kV Transformers, namely Transformer 1 and 3. The electrical boundary for the Vaal Dam Pumping Station is from the 3.3kV Distribution isolator termination point on the primary plant, not including the isolator itself.

The Service Provider ensures that all electrical plant within the boundary of the Vaal Dam Pumping Station is maintained, including all cables, switchgear boards, transformers, motors, lights and plug points.

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4.4.20 Temporary Supplies and Installations

The Service Provider manages, inspects and maintains temporary supplies and installations, in conjunction with others, to ensure compliance through:

- a) Ensuring the installations are safe, earthed and bonded.
- b) Certification of Compliance (SANS 10142 and 10108) from other parties during outages where required.
- c) Installation of temporary supplies as required by Outage Department for other Service Providers.
- d) Installation of temporary Supplies on Site as requested by the Employer.
- e) Submit quotations for works, other than on Grootvlei Site, based on Employer request for Community projects.

4.4.21 Electrical Drawings

The Service Provider shall ensure that drawings are unit specific and available when fault finding and repairs are carried out on plant under his/her control.

The Service Provider maintains all Electrical Plant drawings under his/her control, as follows:

- a) Requests a "latest revision" set of drawings from Engineering department, for each plant system, during General Outage Periods.
- b) Updating of electrical wiring diagrams, Single Line Diagrams, cable block diagrams, schedules and schematic diagrams of Plant by "Red Lining" to "As Built" status of the Plant.
- c) Submission of "Red Line" drawings to Electrical Engineering department, whenever any changes or replacements are affected on Plant through an engineering instruction or modification request, specifically in cases where the equipment is not a "one-to-one" replacement.

In cases where drawings and documentation do not exist and/or do not accurately reflect the "As Built" status of the plant, the Service Provider shall develop and/or update drawings and documentation.

All drawings developed or modified by the Service Provider shall be developed on a professional CAD system according to Eskom drawing standard for submission and approval by Grootvlei Electrical Engineering Department.

4.5 COMMISSIONING

The Service Provider draws up quality documentation and inspection sheets in order to safely commission plant under his/her control. The Service Provider carries out safety testing and commissions electrical plant as and when required.

5. WORKS MANAGEMENT AND CONTROL

The Service Provider manages and maintains all Plant under his/her control by ensuring that:

- a) Work adheres to the Works Management procedures as provided.
- b) Notifications for each work activity that requires execution through the Works Management Planner is created on SAP or other recognised method such as Operations Suite.
- c) Notifications arising from continuous Plant inspections are created when necessary.
- d) Work is scheduled up to 4 weeks in advance, ensuring that the required equipment and spare parts are available for execution of the works.
- e) Works orders are signed off, detailing the condition as found, the status after repairs and the activities carried out to the plant to restore it to a state in which it can perform its required functions.

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5.1 PLANNED MAINTENANCE

The Service Provider manages and maintains the Plant scheduled for Planned Maintenance by adhering to all Legal, Site Regulations, Policies, Standards and Procedures when executing work under Planned Maintenance.

The Service Provider:

- a) Is familiar with the condition of the Plant under his/her control and submits the plan of required maintenance for approval, and arrangement for Plant to become available.
- b) Submits the plan and, in concurrence with the Employer, drafts a detailed Scope of Work for the services to be executed.
- c) Drafts an Inspection Test Plan (ITP) for each Critical activity to be executed on the plant, consulting to determine the necessity of each activity of the ITP.
- d) Notifies the Quality Control department, the Employer, and the Client (Engineering) of all Witness, and Hold points that needs to be signed off, before he carries on with the work.
- e) Executes all work as detailed in the Scope of Work.
- f) Provides all means to execute the services as per the Scope of Work.
- g) Signs off the works orders, detailing the condition as found, the status after repairs, and the activities carried out to the plant to restore it to a state in which it can perform its required functions.
- h) Ensures that the requirements of Corrective, Routine and Preventative maintenance requirements, whichever part is applicable, are included in the Planned Maintenance works package and executed in line with the Detailed Scope of Work.

As shown in Drawing 0.19/16254, the following plant is usually not available during General Outages. As such, maintenance needs to be scheduled and carried out as per maintenance plans and strategies, as and when the plant becomes available:

- i) All HV and LV Substations, including HV Boards and Panels and LV Boards and Panels in these substations, on Common Plant.
- j) All Transformers on Common Plant.

5.2 MINI GENERAL OUTAGES AND GENERAL OUTAGES

The Service Provider manages and maintains the Plant scheduled for the Outage by adhering to all Legal, Site Regulations, Policies, standards, and Procedures when executing work under Outages. To this end, the Service Provider ensures that:

- a) All high Voltage Breakers and Contactors are removed during the start of the General Outage, and the condition assessed, to determine whether it should be serviced and repaired.
- b) Quotations for any additional works are submitted, with task orders requested through Outage Department.
- c) Required testing certification of required items are provided.
- d) Full care and responsibility are taken for items removed from the Employer's Site.
- e) Services are planned in such manner as to minimize any delays and overtime.
- f) Plan is submitted and detailed Scope of Work for the services to be executed is drafted, in concurrence with the Employer.

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- g) Inspection and Test Plan (ITP) is drafted for each Critical Activity, Plant and Level 1 Plant to be maintained, consulting with the Client (Engineering) to determine the necessity of each activity on the ITP.
- h) The Quality Control department, the Employer, and the Client (Engineering) are informed in advance of all Witness and Hold points that needs to be signed off, before carrying on with the work.
- i) Outage report is compiled for all the activities covered in an outage and keeps filed records with an additional copy made available to the Employer.
- j) Certificates, calibration and test reports are made available, with copies provided to the Employer upon request.
- k) All work is executed as detailed in the Engineering Scope of Work and all means are provided to execute the services.
- l) The Service Provider strips down plant, cleans, inspects, repairs, replaces and rebuilds the plant to its original state to restore it to a state in which it can perform its required functions.
- m) The Service Provider makes use of OEM Specifications and Requirements to restore plant and equipment to its original state.
- n) As far as reasonably practicable, the Service Provider shall ensure that a "Clean Condition Area" is maintained during the execution of services, whereby he will be able to account at all times, for all equipment, and tools used in the area where the service is executed.
- o) No interchanging of panels, segregations, fixtures, or items stripped-down on Electrical Switchgear. Items will be marked and replaced in its original position. Every item or fixture removed will be kept in an allocated container for the panel.
- p) Any missing or stripped fixture or fitting will be replaced.
- q) All equipment, parts, or spares that is removed or stripped down from the works shall be counted, listed, bagged, tagged, stored, and signed into, and signed out of, a predetermined outage storage area. It will be the responsibility of the Service Provider to account for each item of the service.
- r) The Service Provider shall have check sheets, and registers updated at all times to assist in this regard.
- s) The Service Provider signs off the works orders, detailing the condition as found, the status after repairs, and the activities carried out to the plant to restore it to a state in which it can perform its required functions.

6. ENGINEERING SERVICES AS REQUIRED BY ESKOM GENERATION

The Service Provider responsible for engineering services, material and labour is required to:

- a) Verify the performance matching requirements of replacement equipment and parts.
- b) Inspect and test prior to and after repairs, recording, reporting and making recommendations and providing the necessary information where applicable.
- c) Provide detailed breakdown reports stating clearly the contributory and root causes of relevant failures.
- d) Evaluate parts for possible re-use, and/or select, design and procure new components, ensuring that replacement insulation systems and other materials are compatible with existing materials.

NOTE: If the replacements parts are not exactly as the originals, the Service Provider demonstrates that the replacement meets or exceeds the capability of the original in all essential requirements with approval from the Employer.

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Furthermore, the Service Provider:

- e) Ensures that the employer and others required (as determined by the Employer) are present during dismantling, testing and assessment to inspect any evidence of failure or aspects of defective design or workmanship uncovered.
- f) Ensures that correct photographic records are made.
- g) Establishes the suitability of equipment to achieve the life extension required by the Employer.
- h) Performs all tests, investigations and calculations required for these purposes.
- i) Submits a written report recording any defects, and detailing the extent of repair and work required to achieve the life extension specified by the Employer.
- j) Produces details of design, working drawings, repair instructions and procedures, and obtains the Employer's prior agreement in writing for the extent of repair and work to be done.
- k) Produces agreed procedures for works inspection and tests, and site commissioning and testing, all with details of acceptance criteria to be attained, as well as reports and/or test certificates detailing actual results attained.
- l) Produces quality plans for the activities concerned before commencing work, together with progress reports as required periodically by the Employer.
- m) Submits details of any redesign, via drawings and documentation for the Employer for agreement.
- n) Produces a consolidated report on all aspects of the work, incorporating all reports, data, acceptance criteria, and quality assurance records.

7. TEST CERTIFICATES

The Service Provider:

- a) Provides a data pack with complete tests and Certificates after completion of any major services as per Client's request and related standards.
- b) Keeps records of all certificates for tools and test equipment or as required by the Employer.
- c) Ensures that test equipment calibration is valid for the period in which work is executed and that certificates are available upon request. All equipment calibration (or recalibration) to be executed by a SANAS approved test facility.

8. HOUSE KEEPING

The Service Provider:

- a) Ensures that all work places are kept clean at all times and interfaces with other Service Providers to ensure compliance.
- b) Discardss waste in correctly allocated coloured waste bins.
- c) Ensures that plant worked on is cleaned before clearance of any permit.

9. TRAINING

The Service Provider arranges and facilitates training to his/her personnel in the maintenance of the plant. The Service Provider issues a list, as directed by the Service Manager, of recommended training activities including duration and location for acceptance by the Service Manager. All relevant courses must be attended as required, on the Service Provider's account.

Practical training is applicable to the activities required to execute all the functions related to electrical work at Grootvlei Power Station, focusing on relevant knowledge and skills, including but not limited to:

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- a) Cable installation and racking.
- b) Cable termination, jointing and testing.
- c) Electrical fault location finding.
- d) Switchgear panel inspection and maintenance.
- e) Motor testing and maintenance.

The Employer shall be responsible for training courses as provided by the Employer's business unit, including but not limited to:

- f) PSR.
- g) FFFR.
- h) ORHVS.

The Service Provider compiles a required Training matrix for employees under his/her control, who attend required courses as stipulated by the Employer.

Table 2 shows the minimum training requirements in order for work to be executed without any special skills. It further highlights the responsible party who provides the training. Proof of training shall be provided as per the work being executed. The training and certification requirements shall be valid for the duration of the contract.

Table 2: Contractor Minimum Training Requirements

Minimum Requirements	Contractor	Eskom
First Aid Training (Level One)	X	
Confined Space Training	X	
Working At Heights	X	
Risk Assessment Training	X	
Medical Fitness Certificate	X	
Power Station Training		X
Power Station Site Safety Induction		X
Eskom LAR Training		X
Eskom Risk Assessment Training		X
Site Coaching (Preparation for Authorisation)		X
Eskom PSR & ORHVS (RP) / Authorised Supervisor Course		X
Basic Firefighting Course	X	
Eskom Arc Flash Training		X

10. SAFETY RISK MANAGEMENT

The Service Provider adheres to applicable Grootvlei Power Station Project Health and Safety Specifications. The Service Provider executes Safety management in terms of NOSA 5 Star requirements and the Occupational Health and Safety Act, Act 85 of 1993.

The Service Provider also adheres to Section 28 of the National Environmental Management Act (NEMA), No 107 of 1998, which deals with the duty of care in respect of the environment and the remediation of environmental damage, as well as the Basic Conditions of Employment Act No 75 of 1997.

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The following Eskom documents are also applicable:

- a) 32-37 Eskom Substance Abuse Procedure.
- b) 32-136 Service Provider Health and Safety Requirements.
- c) 240-62196227 Life-saving Rules.
- d) 32-95 Environmental, Occupational Health and Safety Incident Management Procedure.
- e) 32-727 SHEQ Policy.
- f) 32- 418 Working at Heights Procedure.
- g) 240-62946386 Vehicle and Driver Safety Management Procedure.
- h) 32-520 Risk Assessment procedure.

11. RECORD KEEPING

Record keeping is managed by the relevant Grootvlei Maintenance and Engineering sections to ensure that archived plant history is retrievable on site, to the degree of detail necessary for plant condition and diagnosis.

Copies of all records and documents held by the Service Provider are made available to the Employer at all times, archived for retrieval for a period of at least 5 years.

12. PLANT SAFETY REGULATIONS

Before commencement of services, the Service Provider ensures that all their employees are familiar with relevant Eskom Grootvlei plant safety regulations applicable to contract services, with minimum training requirements included in Section 9, Table 2.

13. COMPLETION COMMUNICATION

Service Provider informs and gives daily feedback of progress on tasks or as requested by the Service Manager up to the point of completion or satisfaction of the Service Manager. All work done must be accompanied by ITPs, signed by the relevant people at Hold and Witness points.

The Service Provider submits reports on all work carried out during the week, with a list of completed tasks communicated to the Service Manager. Reports shall be handed in not later than close of work every Friday.

14. MEETINGS

The Service Provider adheres to the requirements as stipulated and ensures that:

Service Provider representatives attend all relevant meetings, including but not limited to EMD Feedback, daily Plant Focus and Works Management meetings, as well as Outage meetings during Outages.

The Service Provider also interfaces with the Employer's internal organization and other Service Providers that may perform work for the Employer when required.

The Service Provider attends a Monthly scheduled contract meeting, and is given at least 1 day's notice period prior to commencement of meeting.

All meetings shall be recorded using minutes and a register prepared and circulated by the person who convened the meeting. Such minutes or register shall not be used for the purpose of confirming actions or instructions under the contract as these shall be done separately by the person identified in the conditions of contract to carry out such actions or instructions.

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15. SPECIALIZED TOOLS AND TEST EQUIPMENT.

Service Provider must provide all required tools to execute the requirements as is deemed necessary by regulation, standards or the Client.

- a) Service Provider must provide all required tools to execute the requirements.
- b) All tools that need certificates must have valid certificate to comply with safety requirements.
- c) Provide insulated tools as required.
- d) Warning lights x 2
- e) Reflective cones at least 05 meters to a meter length x 4
- f) Provide insulating mats as required of up to 16.5kv. dimensions 2 x 2 meters two pieces
- g) Blower single phase x 2
- h) Compressor single phase 600 litres
- i) Vacuum machines single phase @ 1.5 kW x 2
- j) Single phase extraction fan 2 kW x 2
- k) Service Provider hires any equipment (e.g Cherry Picker) not available by submitting quotations to the employer for approval.

16. INTEGRATION WITH THE EMPLOYER'S ORGANIZATION

The Service Provider Provides the Services in an integrated manner with the Employer's organization at Grootvlei Power Station. To this end the Service Provider:

- a) Performs the day-to-day planning and scheduling of all activities required.
- b) Maintains all required SAP and other electrical maintenance procedures.
- c) Attends to plant breakdowns, until completed, unless otherwise agreed with the Service Manager.
- d) Provides personnel on standby on a 24 hour basis, in accordance with his/her conditions of service. The Service Provider ensures that there is an emergency Standby team. No employee will work more than the allowed overtime hours in any given time.
- e) Provide personnel as required (Planned or Emergent work) as stated in this document, in accordance with his/her conditions of service to perform required services.
- f) Provides personnel that will be authorised, by the Employer, in Plant Safety Regulations (PSR), ORHVS, FFFR or other as is relevant to perform duties required as deemed necessary by the Employer.
- g) Spares requisition from the Employer's main store, in liaison with the Service Manager.
- h) Supply of goods that are not available in the Employer's main store, as directed by the Service Manager when requested.
- i) Assist in the processes to identify goods/equipment/spares needed to effectively maintain/repair the electrical plant as to minimize downtime.
- j) Provide technical advice and component recommendations/specifications.

17. PROVIDING ACCESS TO AND INTERFACE WITH OTHERS

Other Service Providers are working in the same area as the work of this contract. In this regard, the Service Provider co-ordinates his/her work with the Service Manager to maintain harmonious working conditions on Site.

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During the progress of the works, the Service Provider grants access to others who also perform work in the same area, on an as and when required basis. The Service Provider makes his/her own assessment of the problems and difficulties which may be encountered for providing access to and interfacing with others. This includes access difficulties experienced during outages or commissioning phases.

18. DOCUMENTATION CONTROL

All contractual communications will be in the form of properly compiled letters or forms attached to emails and not as a message in the email itself. Communication medium shall be as per agreed method in contract.

19. SAFETY MANAGEMENT

The Service Provider adheres to all site safety regulations at all times, which includes OHS Act 85 of 1993, all relevant SANS and Eskom safety regulations.

All staff will undergo a one day Safety Induction training course one week before site occupation and the Service Provider appoints Safety Representatives to assist with:

- a) Identifying possible hazards, dangers and risks.
- b) Eliminating potentially dangerous conditions and actions.
- c) Ensuring a safe working environment.
- d) Inspecting and recording findings of his/her workplace, submitting a copy on a monthly basis to the Service Manager.

19.1 ESKOM LIFE SAVING RULES

The Service Manager is entitled to request that the Service Provider stop work, without penalty to the Employer, when the Service Provider's personnel fail to conform to acceptable health & safety standards or contravene the health and safety sections and regulations.

In the event of any injury or damage of property or equipment, the Service Manager is to be informed as soon as possible, but not later than the end of the shift by means of a flash report.

The following Life Saving Rules apply and compliance to these rules are non-negotiable:

- a) Open, Isolate, Test, Earth, Bond and/or Insulate Before Touch.
- b) Hook up at Heights.
- c) Buckle Up.
- d) Be Sober.
- e) Ensure you have a permit to work.

19.2 MINIMUM SHE DOCUMENTATION REQUIRED FROM SERVICE PROVIDER

The Service Provider provides and complies with the SHE policy and specification, as determined by Grootvlei Safety department. The Service Provider ensures that he/she has a Health and Safety File, submitted and accepted by the Employer. Grootvlei Power Station's Safety Officer audits these Health and Safety Plan as required, typically once a month, according to the NOSA management system to ensure compliance with the provisions of the Act.

The following minimum documents must be provided by the Service Provider. If not provided, it will be assumed that this information does not exist.

- a) Letter of good standing with COID or a registered insurance body.

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- b) Organogram indicating the names of all persons that will hold legal appointments on the project in terms of the Act.
- c) Expected roles, responsibilities and authority of those who are proposed to receive legal appointments as well as their proof of competency.
- d) Resumes of proposed Safety Officers and Environmental Officers, together with roles, responsibilities and authority, relative to the scope of work.
- e) Proof of environmental, health and safety awareness training (provided by a recognized training body) for all employees required to perform work at Grootvlei. Failure to do so shall result in an immediate termination of the contract.
- f) The Service Provider's company Safety, Health and Environment policy.
- g) Overview of the system and/or program that is used to manage Safety, Health and Environment.

19.3 HEALTH AND SAFETY PLAN (CONSTRUCTION REGULATIONS)

The Service Provider compiles a Health and Safety Plan, filed in a Health and Safety File, comprising of the following:

- a) Proof of the contracting company's own Health and Safety Policy.
- b) Proof of appointments, assignments and designations as required in terms of the Occupational Health and Safety Act, No 85 of 1993 and proof of their competencies.
- c) Proof of Risk Assessments regarding Hazards identified, including:
 - 1) Risk/Task assessed.
 - 2) Date of Risk Assessment done.
 - 3) Persons involved in compiling risk assessment (to be recorded in an attendance register).
 - 4) Identification of the risks and hazards to which persons may be exposed to.
 - 5) Analysis and evaluation of the risks and hazards identified.
 - 6) Documented plan of safe procedures to mitigate, reduce or control the identified risks and hazards.
 - 7) A monitoring plan.
 - 8) A review plan.

The Principle Service Provider ensures that his/her Service Providers (SubService Providers) also have a Health and Safety File, accepted by the Principle Service Provider. The Safety Officer employed by Grootvlei Power Station audits these Health and Safety Plan once a month according to the NOSA management system to ensure compliance with the provisions of the Act.

20. INVOICING AND PAYMENT

Within one week of receiving a payment certificate from the Service Manager in terms of core clause 51.1 of the NEC document, the Service Provider provides the Employer with a tax invoice showing the amount due for payment equal to that stated in the Service Manager's payment certificate.

All invoices to be emailed to:

invoicessskomlocal@eskom.co.za

The invoice shall be addressed to Eskom Holdings SOC Limited as follows:

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Eskom Holdings SOC Limited
Accounts Payable Department
Grootvlei Power Station
Private Bag X
2420 Grootvlei

The following information is include on each invoice:

- Name and address of the Service Provider and the Service Manager.
- The contract number and title.
- Service Provider's VAT registration number.
- The Employer's VAT registration number 4740101508.
- Description of service provided for each item invoiced based on the Price List.
- Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT.

Employer reserves the right to change or modify the payment process according to the best interests of the organisation.

21. PEOPLE

The minimum requirements for people on Site for Safety, Administrative, Support and Technical personnel shall be comprised as follows:

21.1 PEOPLE ON SITE

All electricians' qualifications shall be of technical subjects with a Matric or Technical N3 as minimum, and a valid Trade Test as Electrician.

- a) 1 x SHEQ officer, SACPMCP accredited with at least 3 years' plant related experience.
- b) 1 x Site manager with related Power Plant Experience as defined in the Service information, with a minimum of 3 years' experience and a tertiary education equivalent to N6/S4 Power Engineering Diploma.
- c) 1 x Certified Master Installation Electrician, with at least 5 years' experience.
- d) 1 x Cleaner for offices and ablution facilities.
- e) 2 x Supervisors with minimum National Diploma, N6/S4, in Power engineering, with 3 years' plant related experience.
- f) 5 x Electricians with valid trade test certificates in the electrical field. Out of the five (5), two (2) must have wireman's licences for 3-Phase Installations, with a valid registration at Department of Labour (DoL), in order to assess, and issue Certificates of Compliance (CoC). All candidates shall have a minimum of 3 years' work related experience. All electricians' qualifications shall be of technical subjects with a Matric or Technical N3 minimum, and a valid Trade Test as Electrician.
- g) 8 x Electrical assistants with a minimum of Grade 10 or ABET3 certificate, with 3 years' related work experience in the electrification industry, for the maintenance of lighting and power outlets.

All qualifications to be issued by Department of Education. Training and certification requirements shall be valid for the duration of the contract.

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The Service Provider shall utilise a “Back-up” Standby team to release the first team after twelve hours of consecutive work.

21.2 PEOPLE OUTREACH

The Service Provider makes provision for the training and skills development of “Local to Site” students from areas surrounding Grootvlei, with the following as a minimum:

- a) 3 x learner technicians for practical experience (P1 and P2 practical).
- b) 6 x learner artisans in electrical trade (On Job experience and training).

This shall be executed as part of the National Skills Development programme of South Africa, managed solely by the Service Provider, or as per the SD&L requirements.

22. BBBEE AND REFERENCING SCHEME

While supporting BBBEE and gender equity, Eskom reserves the right to select the technically best candidate as Service Provider.

23. SUBCONTRACTING

23.1 SUBSERVICE PROVIDERS

Contracts with SubService Providers are back-to-back with the main contract, using the NEC conditions of the contract and are subject to acceptance by the Service Manager, prior to such contracts being entered into by the Service Provider.

ECC contracting does not make use of nominated subcontracting, but the Employer may list which SubService Providers or Suppliers the Service Provider is required to enter into subcontracts with. This is usually only required where Plant and Materials need to be obtained from a particular Supplier or group of Suppliers in order to comply with operational standards.

23.2 SUBCONTRACT DOCUMENTATION, AND ASSESSMENT OF SUBCONTRACT TENDERS

Copies of every order issued by the Service Provider to his/her SubService Provider or by his/her SubService Provider to his/her suppliers are submitted to the Service Manager for his/her assessment of the amount due, within the assessment interval. Prices are required to be shown on such orders and in all respects, the copies are true copies of the original order to the subService Providers.

23.3 LIMITATIONS ON SUBCONTRACTING

The Employer may require that the Service Provider must subcontract certain specialised work, or that the Service Provider shall not subcontract more than a specified proportion of the whole of the contract.

24. PLANT AND MATERIALS

24.1 PLANT AND MATERIALS PROVIDED “FREE ISSUE” BY THE EMPLOYER

Plant and Materials provided “free issue” by the Employer shall not be invoiced for by the Service Provider. Materials that are stock items which is required to execute the services of this contract as deemed necessary by the Employer will be made available to the Service Provider and shall therefore be “free issue”. The Service Provider in this regard shall be liable for the replacement of materials/equipment in the event that negligence in handling/use of the equipment is evident.

Employer shall only issue Arc Flash PPE to personnel so as to comply with the regulations and standards as stipulated in this document. Employer shall only reissue Arc Flash PPE that is damaged or is required

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to be replaced as per Arc Flash requirements. Service Provider shall ensure that old/damaged PPE is returned to the Employer prior to re-issue.

24.2 SPARES AND CONSUMABLES

Service Manager may direct the Service Provider to procure spares and consumables where the Service Provider shall submit qualified quotations for approval invoices provided after completion of purchase. These are to be kept by the Service Provider and adequate stock levels shall be maintained.

25. SITE ENTRY, SECURITY CONTROL, PERMITS AND SITE REGULATIONS

The Service Provider applies for access permits (Service Provider's permit) at the Security gate on the start date of the contract. The Service Provider personnel shall be required to be in possession of an access permit at all times.

In order to assist Protection Services with the issuing of permits and the identification of personnel on site, the successful Service Provider is to supply a list of all personnel that he/she intends using on site, at least 1 week prior to entry of the Security Area. This list must be delivered to Protection Services.

The list, identified with the Service Provider's name, is to contain the following information:

- Employee name.
- Employee ID Number.
- The Employer's Safety Coordinator's signature.
- Electrical Maintenance Manager signature.
- Copy of the ID book for every employee of the Service Provider.

Access permits must be returned to protection services when the worker/s leave the site, either after completion of the services, or upon earlier termination of service of a worker during the contract period.

To speed up the process of gaining access to the site, the Service Provider compiles detailed lists of all tools and equipment (including serial numbers where applicable) to be taken on site before arriving at the Power Station Security gate.

An authorised copy of this list must be retained by the Service Provider, to be used again when the tools and equipment are removed from site after the completion of the services. Any additional tools or equipment brought to site, or any tools or equipment removed during the contract period must be reported to Protection Services and all lists amended likewise. Gate release permits will not be issued for the removal of any tools or equipment not specified on the tool list.

The Service Provider's visitors and all personnel shall conform at all times to the security arrangements in force at the site. Application forms for visitors must be filled in by the Service Provider's Site Manager and approved by the Service Manager, one day before the visit and submitted to the Employer's Protection Services office. Visitors will not be allowed on site if the necessary forms are not in the possession of the security staff.

The Chief of Protection Services may, with valid cause, remove any, of the Service Provider's personnel from the site, either temporarily, or permanently. He may deny access to the site to any person whom, in the opinion of the said Chief of Protection Services, constitutes a security risk.

No unauthorised vehicles will be allowed on site. Only Service Provider's Vehicles with displayed Contract Vehicle Permits disks will be allowed on site. Contract Vehicle Applications should be directed to the Service Manager. It shall be at the discretion of the Service Manager/Protection Service Manager to determine the number of vehicles required.

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25.1 PEOPLE RESTRICTIONS ON SITE, HOURS OF WORK, CONDUCT AND RECORDS

The Service Provider will be restricted to the working areas associated with his/her place of work. The Service Provider is forbidden to enter any other areas, and must ensure that his/her employees abide by these regulations.

The Service Provider keeps records of his/her people on Site, including those of his/her SubService Providers. The Service Manager has access to these records at any time, which may be needed when assessing compensation events.

Normal working hours:

- Monday to Thursday:
 - Start: 07h15.
 - End: 16h30
- Friday:
 - Start: 07h15.
 - End 12h15.

Working hours are according to those as per Grootvlei Power Station and shall be subject to change without notice to which the Service Provider shall align. The Service Provider should keep daily attendance register for each employee.

26. PUBLICITY AND PROGRESS PHOTOGRAPHS

Service Providers are to adhere to all the rules and site regulations.

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When downloaded from the EDMS, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

27. SERVICE PROVIDER'S EQUIPMENT

Service Providers must keep records of Equipment on Site including whether it is owned or hired. The records will include safety testing, load testing and proof of calibration:

27.1 TOOLS AND EQUIPMENT

The Service Provider shall have his/her own tools and equipment. Where an expectation is raised that the Employer must pay for such equipment, the equipment will become the property of the Employer, defective equipment shall then be replaced at the Service Providers' cost.

The Service Provider shall ensure that, at the "Technical Evaluation Stage" of the Contract to have available for Inspection the following tools and equipment, as a minimum, but not limited to:

Note: This should be part of the Evaluation criteria and they should have it for the duration of the contract

27.1.1 TOOL BOXES FOR EVALUATION STAGE

The following employees of the Service Provider:

- Master Installation Electrician (MIE)
- Installation Electrician (IE)
- Electrical Artisan
- Assistant Electrician

have access to the following tools for providing services at Grootvlei Power Station:

27.1.1.1 Test equipment LV meters

- a) Multimeters -Fluke 1770 series True RMS digital Multimeters, for each technical employee-calibrated
- b) HV/MV Voltage tester, 1KV range to 16.5 KV with a 6 meter proximity fibre stick- calibrated, minimum of 2.
- c) HV/MV Fluke / Megger testers 5KV, 2 minimum
- d) Amp meters, Clamp on meters, fluke 325 or similar per employee.
- e) Analogue AVO meters (Amps/Volts/Ohms) for insulation testing on Generator systems, 2 minimum.
- f) Fluke 62 MAX, infra-red thermometer, 2 minimum
- g) DC Earth fault locator tester, minimum 1.
- h) Humidity meter Fluke 971 minimum 1.
- i) Digital LUX meter, Fluke 941 or UNI-T light meter 20k Lux,. minimum 1
- j) Multifunction Installation tester

27.1.1.2 Power Tools

- a) Heavy-duty magnetic drill
- b) Heavy duty electric demolition jack hammer concrete drill / breaker
- c) Light duty hammer drill x 2
- d) Corded Impact drill x 2

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- e) Cordless / Battery operated impact drill x 2
- f) Electric angle grinder 2200 wats preferably x 2
- g) Electric baby grinders x 2
- h) Electric heat guns x 2
- i) Hydraulic cable crimpers complete with dice from 10 to 240mm sq x 2
- j) Heavy duty hydraulic cable crimper complete with any source of pump plus dice from 300 to 630 mm sq
- k) Electrical Compressors x 2
- l) Industrial Electrical Blowers x 4
- m) Industrial Electrical Vacuum Cleaners x 2
- n) Single Phase Electrical Extraction Fans x 2

27.1.1.3 Hand Tools

- a) Fully furnished Electricians Tool boxes for each technical employee.
- b) Brother handheld labelling machine 9 to 38 mm cartridge.
- c) Cable core cutters x 2
- d) Measuring wheel
- e) Distance meter x 2
- f) A frame 8 step ladders aluminium x 2
- g) A frame 6 step ladders fibre glass x 2
- h) Torque wrench– calibrated
- i) Screwdrivers- Phillips and Flat
- j) Wire strippers
- k) Spanners Gedore – open ended and ring (6mm-32mm)
- l) Socket wrench with extension bars gedore (6mm-32mm)
- m) Combination Pliers
- n) Nose pliers
- o) Side cutters
- p) Fish tape
- q) Tape measure
- r) Torches
- s) Stanley knives
- t) Drillbits and drill sets.
- u) Ballpen Hammers
- v) Files-course, medium, smooth
- w) Electrical extensions with reels
- x) Marking chalk

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27.1.1.4 Other Equipment

The Service Provider arranges a 22.5m height Cherry picker on "AS and WHEN REQUIRED" basis and shall only have a hourly/day rate, inclusive of the operator or test person.

28. EQUIPMENT PROVIDED BY THE EMPLOYER

The Employer provides Critical Spares as predetermined and available in Stores. Consumables which are stock items shall be provided by the Employer.

28.1 ARC FLASH PPE

All equipment, tools, property, site establishment, services, etc. paid for by the Employer for the Service Provider to use or execute his/her duties becomes the property of the Employer. Any item paid for as stated which is damaged by the Service Provider through negligence, mistreatment or any other method, is replaced by the Service Provider at the Service Provider's own cost.

28.2 POTABLE WATER

The Service Provider may utilize water points on Site. Where no supply is available the Service Provider makes his/her own arrangements.

28.3 ELECTRICAL POWER

Existing 3 Phase 380V and single phase 220V power on site may be utilised by the Service Provider. Where no supplies are available the Service Provider supplies his/her own source. The employer does not guarantee uninterrupted supply.

28.4 SANITARY FACILITIES

Permanent facilities to serve the Power Station terrace are provided by the Employer.

28.5 WASTE REMOVAL

Household waste removal to the bins, as provided on the Site by the employer, is the responsibility of the Service Provider. The Service Provider complies with Employer's policy for waste management on Site, policy. 004/4100. The Employer will provide and empty special colour coded bins for refuse disposal. The Service Provider will be responsible for refuse bins for his/her own site. The Service Provider ensures that all workers under his/her control strictly adhere to the correct use of refuse bins. For the full duration of the services, the Service Provider is responsible to keep the work area clean of any rubble, and to place all refuse into the bins provided.

28.6 TELECOMMUNICATION

Connections are available. The Service Provider applies via the Service Manager for a connection. Connection fees and calls are for the Service Provider's account. If connections are unavailable or not possible, the Service Provider shall provide his/her own means of obtaining communication services. The Service Provider shall provide everything else necessary for providing the Service.

29. FACILITIES PROVIDED BY THE SERVICE PROVIDER

The Service Provider is to provide vehicles and office equipment. The Service Provider has to ensure own cleaning of Protective Clothing. The Service Provider also has to provide own cleaning of the offices, kitchen, stores in the Workshop area and yard.

CONTROLLED DISCLOSURE

30. EXCAVATIONS AND ASSOCIATED WATER CONTROL

In all areas, if it is required to be excavated, an excavation permit will be required. Existing electrical cables, fibre optic cables and underground services may be exposed, or interfered with during the commencement of excavation work in all areas. Ensure the routing of cables, and underground services is identified prior to starting of any excavation.

31. COMMISSIONING

It will be required of the Service Provider to do commissioning on existing and new plant after overhaul and inspection. It will be the liability of the Service Provider to draw up quality documentation and inspection sheets in order to safely commission the plant.

32. ACCESS GIVEN BY THE EMPLOYER FOR CORRECTION OF DEFECTS

Defects shall be attended to as per Works Management guidelines.

33. FIRE PRECAUTIONS

Any tampering with the Employer's fire equipment is strictly forbidden and is a criminal offence. All exit doors, fire escape routes, walkways, stairways, stair landings and access to electrical distribution boards must be kept free of obstruction, and not be used for work or storage at any time. Firefighting equipment must remain accessible at all times.

In case of a fire, report the location and extent of the fire to the Electrical Operating Desk. The Service Provider takes the necessary action to safeguard the area to prevent injury and spreading of the fire.

34. REPORTING OF ACCIDENTS

The Employer follows an accident prevention policy that includes the investigation of all accidents involving personnel and property. This is done with the intention of introducing control measures to prevent a RE-OCCURRENCE of the same incidents. The Service Provider is expected to fully co-operate to achieve this objective. The Service Manager must be informed immediately of any incidents and any damage to property or equipment must be reported within the same shift.

NOTE: This report does not relieve the Service Provider of his/her legal obligation to report certain incidents to the Department of Labour, or to keep records in terms of the Occupational Health and Safety Act, and Compensation for Occupational Injuries and Diseases Act.

35. ACCOMMODATION AND CATERING

The Employer does not provide accommodation.

The Service Provider or any of his/her employees or subService Providers will be allowed to use the Employer's dining facilities.

The Service Provider or any of his/her employees or subService Providers may also buy meals from the fast foods outlet on Site. Lunch time is from 12:00 to 12:30.

Accommodation cannot be the responsibility of the Employer, and charged against, as the Employer supports "Local to Site" Employees first.

36. OTHER ITEMS PROVIDED BY THE SERVICE PROVIDER

The Service Provider shall provide vehicles, office equipment and all required measures to execute the given Services. The Service Provider shall collect what belongs to the Service Provider upon completion of the contract.

CONTROLLED DISCLOSURE

37. CONTROL OF NOISE

Full PPE shall be worn at all times when entering the plant, including all necessary hearing protection.

38. HOOK UPS TO EXISTING WORKS

Eskom Cardinal Rules shall apply and Service Provider shall provide safety harnesses when working at heights.

39. TESTS AND INSPECTIONS.

Safety equipment shall be inspected, tested and calibrated (where applicable) before use by the Service Provider, with a record/certificate kept by the Service Provider, made available upon request.

40. KEY PERFORMANCE INDICATORS (KPI'S)

Performance shall be measured and a Non Conformance Report issued where deemed necessary. The Service Provider shall be measured on performance on the following criteria:

- a) ORHVS and PSR authorisation – target 100%.
- b) ORHVS and PSR compliance and audits – target 100%.
- c) Call out response time – 1 hour reporting to site.
- d) Quality and Safety audits – 100%.
- e) Under Works Management section the following criteria will be met:
 - f) Electrical UF – above 85% (unit availability to generate power).
 - g) Electrical UCLF – below 10% (unit unavailability to generate power, including load losses and trips).
 - h) Electrical OCLF – 0 % (external factors leading to unavailability, lightning strikes, cable theft causing trips).
 - i) Electrical TRIPS – 2 PA, target 0 (unit unavailability due to any electrical failure or trip).
 - j) Electrical PCLF – below 4% (planned electrical work where unit is required to be off load or opportunity outage).
- k) Schedule Compliance – 100% (execution of PM's on time versus submitted plan to execute. 4 week plan).
- l) PM Compliance – 100% (close out of PM's scheduled).
- m) Statutory Violations – 0 violations (statutory PM's executed on time).
- n) QC Compliance – 100% ITP's for critical tasks.
- o) Rework Report – 0 Rework in 90-day cycle
- p) NCR – Non Conformance Report.

A NCR report will be raised leading to an investigation and close out for non-adherence to the KPI criteria.

NOTE: A total of 4 NCR reports raised in a financial year will lead to contract cancellation at the discretion of the Employer.

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41. AUTHORISATION

This document has been seen and accepted by:

Name & Surname	Designation
Ben Madisa	Grootvlei Electrical Maintenance Manager
Boitumelo Shika	Grootvlei Electrical Engineer
Doctor Mazeka	Grootvlei Electrical Engineer
Harrison Ncube	Grootvlei Maintenance Senior Supervisor
Kgotso Makweya	Grootvlei Electrical Engineer
Leonard Janse Van Rensburg	Grootvlei Senior Electrical Engineer
Ntsoaki Fakudze	Grootvlei Maintenance Manager
Richard Brayshaw	Grootvlei Electrical Engineering Manager (Acting)
Thabang Mabote	Grootvlei Maintenance Technician
Thabo Montja	Grootvlei Engineering Manager
Thato Morodi	Grootvlei Maintenance Senior Supervisor

42. REVISIONS

Date	Rev.	Compiler/s	Remarks
May 2022	1	K. Makweya, R. Brayshaw	Renewal of maintenance contract.

43. DEVELOPMENT TEAM

The following people were involved in the development of this document:

- Ben Madisa
- Boitumelo Shika
- Doctor Mazeka
- Harrison Ncube
- Kgotso Makweya
- Leonard Janse Van Rensburg
- Richard Brayshaw
- Thabang Mabote
- Thato Morodi

44. ACKNOWLEDGEMENTS

- Gerhard Botma
- Stein Drotsky

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When downloaded from the EDMS, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.