Eskom	Scope of work	Matimba Power Station

Title: **General Electric Contract**

Document Identifier:	**N/A**
Alternative Reference Number:	**N/A**
Area of Applicability:	**Matimba Power Station**
Functional Area Applicability:	**Maintenance**
Revision:	**2**
Total Pages:	**16**
Next Review Date:	**2031**
Disclosure Classification:	**Controlled Disclosure**

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Date: 2026/02/23	Date: 2026/02/23	Date: 2026/02/27

Contents

1. Introduction

1.1 Matimba Power Station.

Matimba Power Station is in Lephalale, in South Africa's Limpopo Province. Designed to generate 4000 MW, Matimba - the Tsonga word for "Power" – was once the largest direct dry-cooled Power Station in the world, with six 665MW turbo-generator units. Coal reserved guarantees Matimba a minimum lifespan of 35 years, extending to a possible 50 years at 2100 - 2130 tons of coal per hour. The annual send-out power from Matimba amounts to approximately 24,000GWh. Matimba is the holder of the world record of 80 days for six units on load.

Technical details:

- Six 665 MW units
- Installed capacity: 3 990MW
- 2001 capacity: 3 690 MW
- Design efficiency at rated turbine MCR (%): 35.60%
- Ramp rate: 28.57% per hour
- Average availability over last 3 years: 93.67%
- Average production over last 3 years: 23 789GWh

2. Supporting clauses

2.1 Scope

Scope of work is applicable to the Matimba Power Station General Electric works

2.1.1 Purpose

The purpose of this scope is to ensure continuous maintenance and operation of Matimba Power Station.

2.1.2 Applicability

This scope is applicable for Matimba Power Station and the contractor may be required to adjacent power stations.

2.1.3 Normative/Informative References

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

2.1.4 Normative

- Occupational Health and Safety Act, 85 of 1993
- Supplier Contract Quality Requirements Specification
- SABS Quality Standards
- Occupational Hygiene
- Quality Programme ISO9000/1/2
- Construction Regulations 2014
- 240-55714363 – Coal-fired Power Stations Lighting and Small Power Installation Standard
- 240-44175132 – Eskom Personal Protective Equipment Specification
- 240-56536505 – Hazardous Location Standard
- 240-93923223 – Maintenance Manual for Generation Sites
- 240-56356396 – Earthing and Lightning Protection Standard
- 240-44175132 – Eskom PPE
- SANS 10114-1 – Code of practise – Artificial Lighting of interiors
- SANS 10114-2 – Code of practise – Emergency Lighting
- SANS 10142-1 – The wiring of premises Part 1: Low-voltage installations
- SANS 60598 – Luminaires
- SANS 60662 – High-pressure sodium lamps
- SANS 10086-1 – Code of practise – Explosive atmospheres
- SANS 10108 - Code of practise – Hazardous locations
- 0.90/3928-3930 – Eskom Lighting Schedule Standard documents
- Eskom Plant Safety Regulations and Operating Regulations for High Voltage Systems

2.1.5 Informative

Contractor employees shall comply with Eskom's policies and site regulations, including non- use of cell phones in restricted areas, adherence to Eskom's cardinal rules, adherence to Generation Occurrence Management Procedure, no smoking policy, Maintenance URS, etc. These requirements will be detailed during the induction training process and are stipulated in the referenced documents and their references.

a) PG/BLA/001 – Maintenance strategy for lighting and small power
b) Programming and Progress Monitoring Services-Equipment Supply Contractor
c) Accident Prevention Activity Report
d) Eskom Environmental Practices and Standards
e) Eskom vehicle and driver safety management
f) Eskom Standard NWS 1454 Specification for Thermal Insulation
g) PA/272/002 – Hazardous location classification
h) PAM/224/001 – Management of maintenance waste to minimise environmental impact
i) PAM/233/008 – Lighting distribution boards circuit breakers
j) PG/B*/001 – Maintenance execution strategy for switchgear system and overhead lines
k) PWM/STA**/E/006 Repairing lights in battery rooms
l) PWM/AKB**/E/001 – 11kV Overhead ash lines service
m) TOPPE-030 – Maintenance of Lead Acid Batteries
n) TOPPE-035 – Maintenance of Lead Acid Batteries
o) TOPPE-040 – Maintenance of Nickel Cadmium Batteries
p) TOPPE-041 – Maintenance of Nickel Cadmium Batteries

2.2 Definitions

Definitions	**Explanations**
Base/ Core crew	A complement of the *Contractor's* personnel based on site for the duration of at least one year and detailed in the Site Addendum
Outage	A planned or unplanned shutdown project related to one or more of the *Employer's* Power Station units
Regular site maintenance and repair work	Work that does not form part of an *outage* scope of service. This could include opportunity maintenance performed while a unit is on *outage*
Contract services	The services specified in this contract including Domestic, Lighting and general electric services that complies with all the requirements stated in the Service Information.
Contractor	Service provider contracted for supply specific service to ESKOM Matimba power station.
Employer	Eskom or Eskom Matimba power station representative appointed in writing.
Forklift	A vehicle with a pronged device in front for lifting and carrying heavy loads.

Emergency vehicle	An emergency vehicle is any vehicle that is designated and authorized to respond to an emergency in a life-threatening situation. These vehicles are usually operated by designated agencies, often part of the government, but also run by charities, non-governmental organizations and some commercial companies

2.3 Abbreviations

Abbreviations	Explanation
DoL	Department of labour
KPA	Key performance area
KPI	Key performance indicators
DLR	Daily Labour report
GO	General Overhaul
IR	Interim Repair
BTI	Boiler Tube Inspection
BTL	Boiler Tube Leak
OD	Outside diameter
SOS/SOW	Scope of service/ Scope of work
PCLF	Planned capability loss factor
PPE	Personal protective equipment
QCP	Quality control plan/ inspection and test plan
QMP	Quality management programme
SABS	South African bureau of standards
SAP	System, application, products (plant maintenance, procurement, finance, and materials management.
SHE	Safety, health and environment
UCF	Unit capability factor
UCLF	Unplanned capability loss factor

URS	User requirements specification
Maintenance	A combination of all technical, administrative and managerial actions during the lifecycle of an item intended to retain it in, or restore it to, a condition in which it can perform its required function.
Maintenance Philosophy	The principle approach decided upon for performing maintenance, such as pro-active or re-active maintenance.
Maintenance Strategy	The type of maintenance selected for specific asset / plant and equipment, such as time or condition based maintenance, corrective or preventative maintenance.
Maintenance Plan	A plan that details the maintenance that needs to be done on a specific asset / plant item or component and the frequency and quality requirements for that maintenance.
Maintenance Schedule	The timing of the Maintenance Plan information stipulating when in the calendar year, work needs to be done.
Preventive Maintenance	Planned time or schedule based maintenance carried out with the explicit objective of preventing functional failures and is directed towards maintaining the physical condition of the asset / plant or equipment. It includes scheduled overhauls and scheduled replacement of worn out parts or failure prone components.
Corrective Maintenance	The process of restoring asset / plant and equipment which have failed or deteriorated to a state which renders it unable to meet the acceptance criteria required for its particular application.
Condition Based Maintenance	Predictive maintenance carried out because of findings from analysis of parameters measured under a condition-monitoring regime, or from recommendations from reliability analysis.
Emergency Lights	Lights with battery-packs with a short back-up time (1 hour) for use of personnel evacuation and plant safety when there is a blackout situation.
Essential Lights	Lights supplied from the essential boards with a diesel generator back-up or another external power source.
Hazardous Area	This is an area where there is significant risk of igniting gas, vapour or dust.

2.4 Roles and Responsibilities

2.4.1 Contract Manager:

1. Co-ordinating and manage contract budget and expenses
2. Ensure that the contractor operates within the budget
3. Holds monthly meeting with the contractor
4. Communicate technical interface between Eskom and the contractor
5. Ensure that all work performed complies with the OHS act regulation and quality requirements
6. Review, verify, and approve receipt of services/deliverables from the contractor
7. Manage and maintain an contract records and correspondence between the employer and the contractor
8. Ensure that the contractor compliance with the conditions of contract.
9. Resolving any deviations and breaches in relation to the agreed conditions of the contract
10. Contracts manager must keep the original copy to file for history purposes

2.4.2 Contract Supervisor:

1. Assign works order as per maintenance schedule issued by the planner at pre-determined interval
2. Obtain monthly reports from the contractor supervisor, evaluate the information where necessary include identified defects.
3. Assist contract manager with contract management administration
4. Assess any work completed and align it to the scope of work and task order.

2.4.3 Contractor:

2.5 Process for Monitoring

2.5.1 Technical KPIs

Item	KPI	Targets
1	No. of PM's Due	0
2	No. of P1 - P3 Overdue	0
3	Utilisation	100%
4	No. of Rework	0
5	Total Overtime Hours	0
6	Assessments > 25th of M	0
7	No. of NCR's	<3
8	SD&L	100%

2.5.2 SHEQ KPIs

Item	KPI	Targets
1	SHEQ Performance Report	>95%
2	Safety finding	1/month

3. Site Visit

1. Clarification meeting is compulsory for all contractors.
2. A register will be signed by all in attendance and kept as record
3. All official communication will be in the form of writing.

4. Technical scope

Note: The service will require a contractor to have two artisans on standby on a daily basis for the duration of the contract.

4.1.1 ACTIVITIES AS PER WEEKLY PM SCHEDULE AND PLANT DEFECTS

1. Lighting and low voltage system maintenance (Domestic circuits)

- Inspection, cleaning and replacement/repair of all lights at Matimba plant and Hazardous Location Areas per maintenance strategy and standard.
- Inspection, cleaning and replacement/repairs of all 220V & 380V distribution circuits on the Power Station per maintenance strategy.
- Statutory Inspections and repairs electrically on all Portable electrical equipment, workshop equipment and fixed appliances.

2. 11kV Overhead lines maintenance

- Maintenance on 11kv overhead lines in Matimba Power Station which includes but are not limited to inspections, repairs or replacement of support poles, surge arrestors, string insulators fuse links and conductors per maintenance strategy (PG/B*/001 and PWM/AKB**/E/001).

3. Battery maintenance and Station earthing and lightning mat integrity

(Employees to be Hazardous location trained and authorized)

- Battery maintenance: cleaning, topping up of battery water and recording of SG (Specific Gravity) for batteries as per maintenance schedule.
- Yearly earth mat integrity testing of the Power Station at designated testing points as per standard 240-56356396.

4.1.2 Activities as and when required

- Installation, removal and repair of earthing conductors.
- Disconnecting of cables on motors, in junction boxes and electrical panels
- Reconnection of cables on motors, in junction boxes and electrical panels
- Disconnecting of HV and LV connections on Gen Transformers, Unit Transformers, Service Transformers and Auxiliary plant Transformers.
- Reconnection of HV and LV connections on Gen Transformers, Unit Transformers, Service Transformers and Auxiliary plant Transformers.
- Installation of cables in cable tunnels which include installation on applicable cable racks with strapping where required.
- Installation of cables in domestic environment which includes pulling of cables through cable conduits or other parts of buildings.

- Installation of cables in trenches, which includes river sand cover around cable, close up of trenches and tidying of earthworks afterwards to the satisfaction of the employer.
- Cables Joint (220V up to 11kv)
- Fault locating and repair of faults on all 220V to 11kv cables, which includes digging of trenches to expose cable.
- Installation and removal of temporary cabling on outages and projects and new installations.
- Issuing of COC's as Installation and Master Electrician.
- Disconnect and reconnect of flexibles cables/conductors on the Generator, 20KV breaker and other plant or equipment and/or apparatus.
- Cable modification and installation of junction boxes.
- Supply of additional qualified electrical Artisans (As per price list).
- Supply of additional qualified Utilityman (As per price list).
- Supply of electrical spares as and when required.
- The Contractor shall supply their own equipment's/tools as below but not limited to the list, and per price list C.

➢ Equipment's (Generator, ditch switch, rock drill, heavy duty impact drills, TLB, easy access/cherry picker, high mast light winch, 8T truck with high-up, jack hammers and etc)

➢ Tools (Portable electrical equipment's, testing tools and etc)

➢ Consumables (drill bits, pozzy drives, chocolate blocks and etc)

Item nr	Description	No. of persons	Unit	Expected Quantity	Rate	Price
A	**Daily maintenance and standby (core crew)**					
1	Site Supervisor (Normal time)	1	hrs	40hrs per week		
2	Electrical Artisans	8	hrs	40hrs service		
3	Utilityman (Normal time)	16	hrs	40hrs per week		
4	SHEQ Officer	1	hrs	40hrs per week		

6	Site establishment/de-establishment	-	-	-		
B	**Activities as and when required as per item B in the price list below**	-	-	-	-	-
C	**Equipment hires rates required per item C in price list below**	-	month	-	-	-

Item nr	Description	Unit	Expected Quantity	Rate	Price
B	**Activities as and when required**				
1	Supply of additional qualified electrical Artisans (As per price list).	ea	8		
2	Supply of additional Utilityman (As per price list).	ea	4		
3	Issuing of COC's on all Installations as Master Electrician.	Rate only	15		
4	Supply of Electrical Spares as and when required	Rate	10% mark up		

Contractor shall supply their own equipment's/tools as below but not limited to the list.

Item nr	Description	Unit	Expected Quantity	Rate (monthly)	Price
C	**Equipment list**				
C.1	**Permanent on site**				
1	Ladders	ea	6		
2	Spotlights	ea	4		
3	Earth leakage testers 1phase and 3phase	ea	4		
4	Multimeters and insulation testers	ea	12		

5	Polarity testers	ea	4		
6	Safety harness	ea	10		
7	Extensions	ea	4		
8	Picks and shovels	ea	4		
9	Arch flash suits	ea	45		
C.2	**As and when required**				
1	Ditch Switch	ea	80		
2	3 phase Generator	ea	160		
3	Heavy duty Impact drills	ea	40		
4	TLB	ea	80		
5	Easy access/Cherry Picker	ea	160		
6	High mast light winch	ea	160		
7	8T truck with high-up	ea	80		
8	Jack hammers	ea	80		

5. Non-Exclusive Scope

5.1 Contract performance

1. Optimisation of the system and equipment to reduce costs, maintain and enhance the condition of the equipment
2. Maintain the equipment according to best practice and Eskom Computerised Maintenance Management System
3. Conduct inspection and testing of all equipment to assess and monitor equipment condition.
4. Perform maintenance work in accordance of specified standard procedures and check sheet as agreed between the contractor and employer.
5. All work performed within the parameter of the scope of work and act

6. To keep all instructions/ procedures on hand and supply Eskom power station with reference to be included in this document and supply record and history requirements.
7. Ensure that the work is performed to the highest standard and safety standards and regulations

5.2 Warrantee and Guarantee on repairs

The employer requires a twelve-month guarantee on work done.

5.3 SHEQ

Each location where the *service* is carried out has a health and safety specification or procedure and safety risk management requirements relevant to that location (the *Employer*'s site Health and Safety Plan). The CSM shall ensure that he is a registered recipient of such documentation at each location where work is carried out and is always in possession of the current version of such documentation before any work in this contract is undertaken at that location.

The *Contractor* shall comply with the requirements imposed on a contractor / Contractor stated in the current version of such documentation at each location where work in this contract is carried out and shall identify to the relevant SM the name of the *Contractor*'s person responsible for monitoring such compliance.

The *Contractor* shall ensure that he is in possession of documentation relevant to protection of the environment at each location where work in this contract is carried out and shall comply with the requirements imposed on a contractor / Contractor stated therein. The Contractor shall keep records which demonstrate compliance with all health, safety and environmental requirements whether statutory or otherwise and shall allow the SM or relevant SM to inspect them at any time within working hours Employer's Health and Safety Requirements.

In carrying out its obligations to the *Employer* in terms of this contract; in providing the Services; in using Plant, Materials and Equipment; and while at the Site for any reason, the *Contractor* complies and procures and ensures the compliance by its employees, agents, Subcontractors and mandatories with:

The provisions of the Occupational Health and Safety Act 85 of 1993 (as amended) and all regulations in force from time to time in terms of that Act ("the Occupational Health and Safety Act, ACT 85, OF 1993"); and The Eskom "Safety, Health and Environmental Requirements for Contractors" document (as amended from time to time) and such other Eskom Safety Regulations as are applicable to the Services and are provided in writing to the *Contractor* (collectively "the Eskom Regulations"). The Eskom Regulations may be amended from time to time by the *Employer* and all amendments will be provided in writing to the *Contractor*. The *Contractor* complies with the provisions of the latest written version of the Eskom Regulations with which it has been provided; and the health and safety plan prepared by the *Contractor* in accordance with the SHEQ Requirements.

The *Contractor,* at all times, considers itself to be the "Employer" for the purposes of the Health and Safety Act, Act 85, OF 1993 and shall not consider itself under the supervision or management of the *Employer* with regard to compliance with the SHEQ Requirements, the *Contractor* shall furthermore not consider itself to be a subordinate or under the supervision of the *Employer* in respect of these matters. The *Contractor* is at all times responsible for the supervision of its employees, agents, Subcontractors and mandatories and takes full responsibility and accountability for ensuring they are competent, aware of the SHEQ Requirements and execute the Services in accordance with the SHEQ Requirements

The contractor shall follow all Eskom's safety requirements including all lifesaving rules and regulations required to perform the work. No work will be performed without a permit to work being issued; therefore, the contractor must be authorised to take permit within six months from the award of the contract or contract start.

5.4 Contractors responsibility

1. The contractor will be responsible for the inspection on daily base.

2. The contractor will be responsible for a clean and needy working area.
3. Housekeeping must always be good and follow proper stacking standards

5.5 Turn-around and response time

The maximum turnaround time for the major breakdown repair work is at least **24 hours,** and call outs respond time is 30 **minutes.**

5.6 Quality control standards:

Quality control plan shall be produced, maintained and implemented per task as agreed by the employer. The QCP must be discussed with the employer for approval. This QCP shall comply with ISO 9001:2015 standards. Any amendments to the QCP shall be discussed with the employer for approval.

5.7 Eskom Policies

The contractor's employees shall comply with Eskom's policies and site regulations, including but not limited to the use of cell phone while driving, in restricted areas, adherence to Eskom's lifesaving rules, smoking policy, zero tolerance on alcohol usage, etc. these requirements will be discussed in details during induction training process.

5.8 Emergency

The contractor will be required to attend to emergencies at no extra cost.

5.9 Pricing/Cost Breakdown

1. Costs to be provided against categorised activities.
2. Cost to be provided in Rands, and in an electronic excel workable formats.
3. Cost should at least be valid for 60 days in order to accommodate Matimba procurement process.
4. Cost should be listed in the spreadsheet and broken-down accordingly. E.g. SHEQ, training, spares, etc.
5. Contractor to provide warranties and guarantee
6. The safety costs must be quoted separately.

6. Technical evaluation

1. Technical evaluation will be based on the technical evaluation criteria
2. Valuation report should be signed by Maintenance Manager
3. Commercial documents should be signed by Commercial Manager.

7. Records

1. Every official meeting will have an attendance register and meeting minutes recorded and kept in a file.
2. Minutes of the meeting shall be signed by all parties
3. All communications must be recorded in an email and kept in a file.

8. General:

1. Housekeeping must always be good and follow proper stacking standards
2. Contractor must consider local skills and local to Lephalale
3. Employees must be provided with proper accommodation at least with water, lights and sanitation. (evidence required)
4. Contractor will provide own PPE, branded with contractor's name. no Eskom PPE to be used by the contractor.
5. Contractor will provide own Tools, no Eskom Tools to be used by the contractor.
6. Contractor will attend meetings as required
7. Assessments to be submitted on the 25th of every month, failure to submit will lead to NCR being issued.
8. Contractor not allowed to use Eskom tools and equipment to execute tasks and jobs. Must have their own tools, Portable tools, generators, ladders, spade and shovels
9. If an artisan or tech assistant is on leave immediate replacement will fill the vacant post that is capable to do the absent person's work.
10. Contractor needs to establish their own contractor site with offices, tool store and tearoom facilities. A water and electrical supply point for their site will be provided for them. Eskom will supply an area for site establishment.
11. Contractor needs to have efficient transport facilities to transport their personal and equipment on site as and when required.
12. Contractor must have their own electrical testing equipment's to do all the relevant test like single and 3 phase earth leakage testers, Voltage and isolation testers, tong testers
13. Contractor must supply its workers with the relevant arc flash equipment as per Eskom standards.

9. Acceptance

This document has been seen and accepted by:

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10. Revisions

N/A

11. Development Team

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

1. Gwadamani Sehlako
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12. Acknowledgements

N/A