

 Eskom	Scope of work	Matimba Power Station
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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.

1.2 Plant description

Fire Detection System (FDS) comprises of fire detection SCADA HMI's system, HVAC fire control dampers protection system and field instrumentation sensing devices, installed all over the entire station.

1.3 System description

Field instrumentation (pressure switches, gauges, linear heat detection sensing and suppression and other fire sensing devices) is used to detect fire and transfer relevant information, relating to area and type of fire to various Aritech fire detection panels and SCADA HMI's system at EOD, Air conditioning and Computer workshops.

The SIEMENS HVAC fire control dampers are installed, controlled, and activated or closed by the SIEMENS building management fire system (Desiego – software by Landis & Staefa) when smoke /fire is detected by two detectors (double knock) around the same area.

The fire detection SCADA HMI's system monitors the entire fire detection and protection systems all over site. The fire detection system includes all additional fire detection that may be added as improvement of the existing fire detection system or any other fire detection that may be installed in Matimba after the contract start date.

The plant to be worked on includes the following areas, which do not limit the applicability of this contract but includes the Matimba site fire detection system as a whole:

I. Units 1-6 Panels

- Repairing/replacing and configuring fire panels, damaged loop and field cables, addressable IO nodules, smoke and fire detectors, heat and linear heat detection and manual call point in the Units building and associated structure.
- Testing and replacing batteries in the panels
- Execute preventative maintenance as stipulated in the maintenance strategy.
- Maintenance and repairs of relevant interfaces

II. EOD Fire system

- Repairing/replacing and configuring fire panels, damaged loop and field cables, addressable IO nodules, smoke and fire detectors, heat and linear heat detection and manual call points in the EOD building and associated structure.
- Testing SCADA network communication and switches
- Testing and replacing batteries on repeater panel
- Execute preventative maintenance as stipulated in the maintenance strategy.

III. SSB Panel and H2 Plant

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- Repairing/replacing and fire panels, damaged loop and field cables, addressable IO nodules, smoke and fire detectors, heat and linear heat detection, and manual call points in SSB building and its associated structures.
- Repairing and replacing of fire detectors on the H2 plant
- Execute preventative maintenance as stipulated in the maintenance strategy.
- Maintenance and repairs of relevant interfaces

IV. Fire Station Panel and Simulator

- Repairing/replacing and configuring of fire panels, damaged loop and field cables, addressable IO nodules, smoke heat and fire detectors and manual call points in the simulator and administration buildings across site.
- Repairing and replacing of fire detectors in the simulator building
- Execute preventative maintenance as stipulated in the maintenance strategy.

V. Security and Lapa Panels

- Repairing/replacing and of fire panel, damaged loop and field cables, addressable IO nodules smoke heat and fire detectors and manual call points at the security buildings and Lapa.
- Testing of the network to be communicating to the SCADA System at EOD

VI. Workshop panel 8

- Repairing/replacing and configuring of the fire panel, damaged loop and field cables, smoke heat and fire detectors and manual call points in all the substations and workshops in the Power station.
- Testing and replacing of the batteries at all silos where still applicable.
- Repairing of broken linear temperature detector cable on the incline belts and interfaces where still applicable.
- Execute preventative maintenance as stipulated in the maintenance strategy.

VII. Drive house 1 to 6

- Repairing/replacing and configuring of the fire panel, damaged loop and field cables, smoke and fire detectors and manual call points in all applicable drive houses.
- Testing and replacing of the batteries at all the drive houses where still applicable.
- Repairing of broken linear temperature detector cable on the incline belts and interfaces where still applicable.
- Execute preventative maintenance as stipulated in the maintenance strategy.

1.4 Purpose

The purpose of this scope is to maintain and provide technical support as well as to supply spares as and when required to ensure the reliability and availability of all FDS components and systems.

1.5 Scope

Scope of work is applicable to the Matimba Power Station FDS as defined above.

1.5.1 Applicability

This document is applicable to Generation Matimba Power Station Fire Detection System.

1.6 Normative/Informative References

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

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The following documents contain provisions that, through reference in the text, constitute requirements of this document. At the time of publication, the editions indicated were valid. These documents are subject to revision and users are responsible to ensure that the most recent editions of the documents listed below are used/ referenced.

2.3.1 Normative

- a) 240-56737654 Inspection, Testing and Maintenance of Fire Detection Systems Standard
- b) 240-54937454 Inspection, Testing and Maintenance of Fire Protection Systems Standard
- c) 240-86738968 - Standard for Security Alarm Systems for Protection of Eskom Installations and its Subsidiaries
- d) GGR 0992 - Plant Safety Regulations
- e) Act no 102 of 1980 - National Key Point

2.3.2 Informative

- a) Eskom Integrated Risk Management Procedure, 32-391.
- b) Reporting, Recording, Investigating, Costing and the Follow-up of SHE Incidents Accidents, 39-7.
- c) GGS 0386-Requirement for Power and Control cables for Power station
- d) Environmental, Occupational Health and Safety Incident Management Procedure, Rev 4 32-95
- e) Reporting, Recording, Investigating, Costing and the Follow-up of SHE Incidents Accident, 39-7
- f) Occupational Health and Safety Act No: 85 of 1993: Driven Machinery Regulation, 2015. GNR.541 of 24 June 2015
- g) NFPA850 Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations
- h) Eskom Integrated Risk Management Procedure, 32-391
- i) ISO 9001:2015 Quality Management Systems
- j) SANS 10139-2012 Fire Detection
- k) SANS 246: Code of Practice for Fire Protection for Electronic Equipment Installations
- l) NFPA72-National Fire Alarm and Signalling Code
- m) 240-54937439 Fire Protection - Detection Assessment Standard
- n) 240-54937450 Fire Protection and Life Safety Design Standard
- o) 240-56737448 Fire Detection and Life Safety Design Standard
- p) PG/SG/001 Maintenance execution strategy for the air conditioning and the fire detective plant

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1.7 Definitions

Definition	Description
Fire Detection System	An electronic system used to detect fire in its early stages.
Fire Protection System	An automatic system comprising of dampers, sprinklers and valves that operate in the event of a fire.
Public Address system	An electronic system comprising microphones amplifiers and loudspeakers and related equipment used to address a large or remote area.

1.8 Abbreviations

Abbreviation	Description
FDS	Fire Detection System
MW	Megawatt
SSB	Support Services Building
SCADA	Supervisory Control and Data Acquisition
EOD	Electrical Operating Desk
MDF	Main Distribution framework
EP	Emergency preparedness
SHE	Safety Health and Environment
SANS	South African National Standards
ISO	International Organisation of Standards
RWM	Routine Works Management
CM	Corrective Maintenance
PM	Preventative Maintenance
SANAS	South African National Accreditation System
LTI	Lost Time Injury
KPI	Key Performance Indicator
PSR	Plant Safety Regulations
PPE	Personal Protective Equipment
SAPS	South African Police Service
SSA	State Security Agency
PSIRA	Private Security Industry Regulatory Authority
SABS	South African Bureau of Standards
SAQCC	South African Qualification and Certification Committee
ORHVS	Operating Regulations for High Voltage Systems
RP	Responsible Person
PTW	Permit to Work

1.9 Roles and Responsibilities

1.9.1 Contract Manager-

- Co-ordinating and manage contract budget and expenses.
- Ensure that the contractor operates within the budget.
- Holds monthly meetings with the contractor.

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- d) Communicate technical interface between Eskom and the contractor.
- e) Ensure that all work performed complies with the OHS act regulation and quality requirements.
- f) Review, verify, and approve receipt of services/deliverables from the contractor.
- g) Manage and maintain a contract records and correspondence between the employer and the contractor.
- h) Ensure that the contractor compliance with the conditions of contract.
- i) Resolving any deviations and breaches in relation to the agreed conditions of the contract
- j) Contracts manager must keep the original copy to file for history purposes.

1.9.2 Contract Supervisor-

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

1.9.3 Contractor-

- a) Maintenance of the FDS in accordance with the relevant procedure and specification
- b) Ensure that all the systems of the FDS comply with the statutory and environmental requirements.
- c) The Contractor to provide technical support and advice on constant failure trends of the equipment.
- d) Provide consistent and cost-effective maintenance strategy.
- e) Ensure that the application and implementation of appropriate maintenance tools and innovative techniques.
- f) Develop Key performance Indicator (KPI), objectives and targets which support and which in line with the Employer's objectives.
- g) To provide adequate resources capabilities to carry out maintenance and inspection work and that support the Employer's objectives.
- h) The contractor to adhere to all Employer's health and safety requirements and procedures on site.
- i) The contractor to provide relevant documentation caters for the employer's equipment. This will include all records keeping of all activities, plant conditions and quality control and safety documentation.

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- j) The contractor shall comply with all relevant SABS standards, OHS Act 1993 and Driven Machinery regulation, also with the Employer's standards as specified from time to time.
- k) The integrity of the plant is maintained within the parameters specified by the Employer.
- l) All other maintenance activities to be performed in accordance with the relevant procedure and specification where applicable.
- m) All plant manuals and other documentation as requested by the Employers will be returned or submitted by the contractor.
- n) The contractor shall record and report to the Employer the following:
 - 1. All incidents and equipment failure to be reported to the Employer within the same day.
 - 2. The contractor must provide monthly overall system performance report.
 - 3. The contractor submits to the Employer, a fully substantiated written damage report specifying the nature, scope and cost of rectification work required including a programme for execution.
- o) Obey an instruction which is in accordance with the contract and is given to him/her by the Service Manager.
- p) Draft and send monthly plant status report and failures to the Service Manager as required.
- q) Attend toolbox meeting.

1.10 Process for Monitoring

Item	KPI	Targets
1	Comply with RWM (CM and PM compliance)	No priority 1>3days No priority 2>5days No priority 3>30days No priority 4>18months No outstanding PM's
2	Safety finding	1/M
3	Spares Availability	100%
4	Quality	No rework
5	NCR	Less than 2 Per Month
6	Emergency response time	30 Minutes
7	Statutory PM Overdue	0%
8	Assessment	25 of each month
9	Utilisation	100%

1.11 Related/Supporting Documents

- a) NEC Term Service Contract.
- b) 32-1303 Process control Manual (PCM) for execute maintenance work.
- c) 32-1304 Process Control Manual (PCM) for manage work.

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2 Technical Scope

2.1 General

- a) The contractor must provide Technicians and Semi-Skilled to maintain the Fire Detection system on a 24/7hr basis. Take note of Matimba 2-person rule for afterhours work shall apply.
- b) The contractor(s) employees allocated to this contract need to be security cleared by the **SAPS**
- c) The contractor will ensure they have user and administration rights on the relevant systems.
- d) The contractor will execute all FDS related Corrective (CM) and Preventative (PM) work orders generated on the SAP Maintenance system and in line with the Maintenance Strategy for the systems and according to the RWM process.
- e) Maintenance includes Fire detection components and SCADA HMI's system, repairs, replacement, installation, and termination of all FDS cables and fibre optic cables, networks and network cables and relevant servers for the system.
- f) Maintenance includes replacement of pressure switches, gauges, smoke and fire detectors and all other devices and equipment related to the fire detection system. Calibration of switches and gauges will be done by Eskom Matimba personnel Control and instrumentation department.
- g) Maintenance includes annual calibration of test equipment by a SANAS accredited service provider.
- h) The contractor will be ORHVS module1 authorised within 3 months of contract commencement.
- i) The contractor will have an authorised RP (responsible person) in terms of the Eskom Permit to Work system within 6 months of contract commencement.
- j) Contractor to carry out the works work without assistance from Eskom Employees.
- k) The contractor must report and recommend solutions of repeat failures.
- l) Contractor to provide own PPE and Tools to execute work.
- m) Contractor to provide own accommodation and transport to and from site as well as on site and ensure that all employees who are authorised to drive a motor vehicle or specialised vehicle have the required authorisation to do so.
- n) Contractor will utilise computer workshop.
- o) Contractor to propose and implement continuous improvement.
- p) Contractor to submit monthly report on the plant health and compliance report.
- q) The contractor must be able to expand and do installations on the systems as and when required.

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2.2 Description of the works

- a) The contractor should be able to identify and replace any faulty fire detection components of the fire detection system installed at Matimba Power Station as per maintenance strategy PG/SG/001
- b) Contractor will start work at 07:00 in the morning until 16:30 every Monday to Thursday and from 07:00 to 12:00 on Fridays.
- c) Contractor will be providing a standby person for responding to any breakdowns for afterhours (16:30 to 07:00 the following day on every weekday) and on weekends (from 12:00 on Friday till Monday 07:00)
- d) The contractor will be supplied by the necessary spares by Eskom.
- e) The day-to-day work as described will be executed as per the PMs and CMs contained in the maintenance strategy PG/SG/001.
- f) Equipment inspection will be inspected daily, weekly, monthly, and quarterly as per the SANS10139.

2.3 Non-Exclusive Scope

2.3.1 Tools and Equipment

- a) The contractor will be required to provide their own tools and equipment when providing the fire detection maintenance services.

2.3.2 Training and Competencies

The contractor will be required to transfer skills to Eskom employees. Eskom will provide PSR and ORHVS module 1 training to the contractor personnel allocated to this contract and if the employee/s fail the first attempt, it will be on the cost of the contractor to proceed to other attempts. It is expected of the contractor to be ORHVS authorized module1 (Access) within 3 months and PSR authorised within 6 months of the contract start date.

The contractor is also responsible to ensure their personnel is trained and competent to perform maintenance activities on the associated systems and that training is up to date and maintained.

2.3.3 Site facilities

- a) Workshop.
- b) Electricity.
- c) Telephone services- supplier to pay for all private telephone calls.
- d) Secure parking for vehicles.
- e) Free access to all relevant premises.
- f) Access to Eskom IT systems and networks.

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- g) All plant and materials excluding consumables.

2.3.4 Safety precautions

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 3 months from the award of the contract or contract start.

2.3.5 Deficiencies and modifications

No modification shall be done on plant and equipment without following the ECM process.

2.3.6 Turnaround Time

- a) Callout response time is 30 minutes.
- b) The maximum turnaround time for the breakdown repair work is 24 hours.

2.3.7 Data Pack

After failure, an investigation must be conducted. The following shall be submitted to the employer and will remain property of Eskom:

Failure analysis report with pictures

Detailed service report specifying the work done.

2.3.8 Quality

The contractor to supply a quality assurance plan in accordance with the requirement of ISO 9001:2015 to the employer for approval. This plan must ensure an integrated quality service as part of the contract. All quality hold points, and witness point must be done in the presence of an Eskom employee. Quality documents to be handed to the employer.

2.3.9 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.

2.3.10 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, work/activities in restricted areas, adherence to Eskom's lifesaving rules, smoking policy, zero tolerance on alcohol usage, etc. these requirements will be discussed in detail during induction training process.

2.3.11 Permanent Core Crew and Minimum qualification

- a) **Fire detection Technicians (X2)**

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-SAQCC Level 4 Commissioner/Serviceman.

-Minimum of 5 years' experience as a Fire detection Technician.

b) Assistant Fire detection (X2)

-Matric.

-Minimum of 3-year experience working as Assistant fire detection.

2.3.12 SHEQ requirements

Provide safety requirements related to activities identified in the scope of work.

2.3.13 Meetings

- a) Contractor is required to attend a daily toolbox meeting.
- b) A monthly SHEQ meeting
- c) A monthly technical feedback meeting
- d) Any other meeting that may be initiated and scheduled by the contract manager or contract supervisor.

3 Record(s)

Users should keep records of signed minutes, attendance registered, and all communications must be recorded in an email and kept in a file. All records and archives are to be recorded using Eskom Systems. Expected records to be captured reported and archived are daily logs of plant inspections and defects, weekly and monthly records of each contractor and any other report that might be deemed necessary by Matimba Power station. All records should be submitted manually and electronically to the relevant Contract supervisor or Contract manager. Any records or drawings developed will remain property of Eskom Matimba Power Station.

4 Revisions

N/A

5 Development Team

- The following people were involved in the development of this document:
- Maropeng Seshoka
- Adrian Buhrmann

6 Acknowledgements

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