

	Specification	Kusile Power Station
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Title: Kusile Power Station Flue Gas Cleaning and Maintenance Scope of Work

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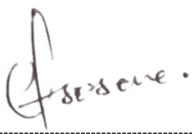
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1. Introduction

Kusile Power Station is a six (6) turbo-generator power plant with a once through boiler utilising Pulse Jet Fabric Filter (PJFF) Plants. The PJFF plant is used to control particulate emissions within the limits set by the Department of Environmental Affairs (DEA). In order to achieve expected PJFF performance,

- i. Bag life of 36 000 operational hours
- ii. Pressure drop across the PJFF not exceeding 2.5 kpa
- iii. Cage design life of 108 000 operational hours
- iv. Particulate emissions not exceeding 50mg/Nm³

It is necessary to do preventative maintenance on the FFP's and associated equipment. This document contains a generic Outage Philosophy and Scope of Work (SOW) for PJFF.

2. Supporting Clauses

2.1 Scope

The works instruction for maintenance of PJFF is stipulated in terms of:

- a. The Scope of work (SOW)
- b. The quality requirements as part of a quality control plan (QCP)

2.1.1 Purpose

The purpose of this document is to define the specified Flue Gas cleaning Mechanical Maintenance scope of work activity requirements for Kusile Power Station. The station is expected to perform at 92% UCF, 6% PCLF and 2% UCLF, and the specified Flue Gas cleaning Mechanical Maintenance activities and management strategy efforts must support this requirement. It is therefore imperative that the successful and suitably qualified Contractor aligns his/her organisation fully to these specified scope activities and processes laid down in this document.

2.1.2 Applicability

This document shall apply throughout Eskom Kusile Power Station

2.1.3 Effective date

This Document is effective from the authorisation date

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2.2 Normative/Informative References

2.2.1 Normative

2.2.1.1 240-56247788 Welding Defects Classification and Reporting.

2.2.1.2 240-92863421 Kusile Power Station Pulse Jet Fabric Filter Plant Maintenance Execution Strategy

2.2.1.3 240-105776552 Kusile Power Station Waste Management

2.2.1.4 ISO 9001 Quality Management Systems

2.2.1.5 240-105658000 Supplier Quality Management Specification

2.2.1.6 240-56242363 Eskom Standard for Emissions Monitoring and Reporting.

2.2.1.7 240-48929482 Tender Technical Evaluation Procedure

2.2.1.8 SABS ISO 14001 Framework of control to ensure that all SHE risks are considered along an auditable tract to ensure a successful outcome and continuous improvement.

2.2.1.9 32-391 Eskom Integrated Risk Management Procedure

2.2.2 Informative

2.2.2.1 240-122800688 Generic Philosophy and Scope of Work for General Overhauls and Interim Outages on Fabric Filter Plants Guideline

2.3 Definitions

2.3.1 Contractor: Service provider contracted for supplying specific service to Eskom, Kusile Power Station.

2.3.2 Employer: Eskom, or Eskom Kusile Power Station

2.4 Abbreviations

Abbreviation	Description
BOM:	Bills of Material
AEL:	Air Emission License
ID:	Induced Fan

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Abbreviation	Description
ESWS	Emergency Spray Water System
AAS:	Air Attenuation System
GAH:	Gas Air Heater
PJFFP:	Pulse Jet Fabric Filter Plant
KKS:	Identification System for Power Plants
NEC3:	New Engineering Contract
ORHVS	Operating Regulations for High Voltage Systems
PAS55	Asset Management Standard
PCLF:	Planned Capability Loss Factor
PM:	Plant Maintenance
PSR	Plant Safety Regulations
SAP PM:	SAP Plant Maintenance
SAP:	Systems, Applications, Products (Plant Maintenance, Procurement, Finance and Materials Management) integrated maintenance management system.
SOW:	Scope of Work
TSC:	Term Services Contract
UCF:	Unit Capability Factor
UCLF:	Unplanned Capability Loss Factor

2.5 Roles and Responsibilities

Note: Further roles and responsibilities can be obtained from the NEC3 TSC book.

2.5.1 The Employer

- a. Performance is measured by the Employer against those areas which contribute to the Employer's business and the Contractor shall be compensated accordingly. (e.g. Reliability, Availability and Safety).
- b. Areas of measurement include the Employer's key business indicators and will be redefined from time to time.

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- c. Employer shall provide training for PSR, ORHVS, FFFR and any other training as deemed necessary by the Employer.
- d. Employer to provide special tools where applicable.
- e. The Employer and Contractor in this SOW is committed towards the following;
 - i. Retention of critical skills
 - ii. Continuous cost reduction
 - iii. Health & Environment Safety
 - iv. Transfer of operational experience and skills

2.5.2 The Contractor

- a. The Contractor shall compile improvement programmes to enhance plant performance and achieve cost reductions and the Employer will approve such programmes.
- b. The Contractor shall be responsible for all mechanical maintenance as per Employer's instructions, processes and systems.
- c. The Contractor shall be responsible to provide a competent person for the maintenance of all pneumatic related equipment in regards to this scope SOW.
- d. The Contractor shall be responsible for the inspection, of all structural and support steel work in this scope of work including but not limited to;
 - i. Walkways
 - ii. Grating
 - iii. Handrails
 - iv. Cat ladders
 - v. Supports
- e. The Contractor shall be responsible for the following complementary services to improve Plant and labour performance
 - i. Procedure and documentation writing
 - ii. Compile and improve task list's
 - iii. Implement approved design and modification
 - iv. Spares management
 - v. Technical advice
 - vi. Operational and production process review
 - vii. Asset management in accordance with PAS55
 - viii. Component failure analysis reporting
- f. The Employer may request the Contractor to ensure that an accurate description of spare parts is maintained in the Employer's stores and the Contractor informs the Employer as to any recommended changes.

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- g. The Contractor shall ensure that any service rendered does not interfere with the Employer's scheduled work and should align himself with the Employer's work control management process.
- h. Should the Employer become aware of any changes to the activity schedule (programme of notifications), the Employer may issue the Contractor with a revised programme.
- i. Should the Employer become aware of any changes to the activity schedule (programme of notifications), the Employer may issue the Contractor with a revised programme.
- j. The contract entered into with the Contractor is non-exclusive and work against this contract can only be performed upon receipt of a task order.
- k. All works will be subject to anytime inspection from the Employer.
- l. Please note that equipment will only form part of the works once the respective area has been commissioned and handed over to Generation. The Contractor shall take cognisance of the fact that the contract start date can deviate.
- m. The Contractor maintains all year round, agreed base crew at Kusile Power Station which is supervised by the Contractor with any changes to the crew being negotiated and agreed upon with the Employer.
- n. The Contractor will utilise the rotatable process for all refurbishable spares items. Employer to provide appropriate training.
- o. This contract is for preventative, predictive, corrective maintenance (breakdowns) and outage SOW (Priority 4).
- p. Containment and clean-up of spillages is viewed to be very important for plant housekeeping and any spillage caused as a result of the Contractor shall be cleaned by the Contractor.
- q. The Contractor shall perform leak checks on all responsible plant areas and inform the Employer's representative accordingly. Defects must be raised on the system to address any plant deviations.
- r. The Contractor shall ensure the integrity of plant labelling and that deficiency with regards to KKS labelling is reported immediately.
- s. The Contractor must ensure that they have Responsible Persons (in terms of PSR and ORHVS) for any work performed on plant.
- t. All maintenance technically qualified (above semi-skilled) Contractors shall be trained and authorised (in terms of PSR and ORHVS) within 6 months of the contract start date.
- u. The Contractor to provide relevant tools as required.
- v. The Contractor shall assist in the implementation, recommendations and corrective actions which are identified by the Kusile Power Station Condition monitoring programme, including EtaPRO™ performance & condition monitoring programme.
- w. The Contractor shall implement a program of continuous improvement to optimise plant performance and reduce system and equipment failures.
- x. The Contractor shall participate in improvement programs as stipulated by the employer.
- y. The Contractor shall be responsible for the removal and disposal of the Fabric Filter bags in accordance to Kusile Power Station Waste Management Procedure

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2.5.2.1 Re-commissioning

- a. All Plant equipment maintained shall be re-qualified as per site specific procedure after any maintenance intervention.
- b. The Contractor shall be responsible or held liable for any defects arising from maintenance/operational faults twenty four hours after an intervention, provided that the equipment has been placed into service.

2.5.3 Management and Reporting

- a. The type of reports, level of detail and frequency of reporting will be mutually agreed by the Employer and the Contractor during the contract negotiation phase of this agreement. These may change from time to time on request by the Employer.
- b. The Contractor to be represented at all production and outage related meeting which may be daily, weekly or monthly.
- c. The Contractor to be represented at all Employer safety meetings.
- d. The Contractor to be represented at any ad-hoc meetings that may arise in order to address any production or safety related matters.
- e. Liaison meetings shall be held with the Employer's Representative or his/her delegate on a monthly basis to discuss any technical details, or concerns.

2.5.3.1 Contractor's management, meetings and key people

- a. Before work starts on site, an inaugural meeting is held with the Contractor and the Employer, to explain in detail all requirements of the Site Regulations.
- b. The Contractor is issued with a file of current Site Regulations on arrival. The file remains the property of the Employer and the Contractor is responsible for its maintenance and updating to include new or revised regulations as issued by the Employer.
- c. The Contractor must ensure that all personnel operating mobile equipment and vehicles are authorised where applicable, this includes but not limited to;
 - i. Forklifts
 - ii. Mobile Cranes
 - iii. Cherry Pickers
 - iv. Sky Jacks
- d. The Contractor shall be responsible for the regular inspections and daily equipment checks of the mobile equipment and vehicles including record keeping.
- e. The Contractor must ensure that all personnel performing work on the plant are authorised, this includes but not limited to;
 - i. Confined space locations
 - ii. Working at heights
 - iii. Heat stress areas
 - iv. Hazardous substances

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2.5.3.2 Communication and Correspondence

- a. All correspondence includes;
 - i. Kusile Power Station
 - ii. Employer's Contract number
 - iii. Contract description
 - iv. Correspondence subject matter
 - v. Employer's name and contact details
 - vi. Contractor contact details
 - vii. Date
- b. Where appropriate the correspondence includes the Employer's reference and is delivered as a single package.
- c. All communications from the Contractor are numbered sequentially with a prefix as advised by the Employer. The Employer responds in like manner. The prefix and numbering system is decided upon at the Inaugural meeting.

2.5.4 Quality and Documentation Control

- a. The Contractor shall compile QCP's and method statements and submit to the Employer for review and approval. They shall ensure any witness, hold and inspection points are strictly adhered to.
- b. The Contractor to ensure that all measuring and test equipment is calibrated at all times & proof thereof must be readily available.
- c. All Quality References and Standards as stipulated in this document will be adhered to.
- d. Work will only be conducted with an Employer approved Quality Management Programme.
- e. The Contractor shall utilise the Employer's quality documentation management system and processes.

2.5.5 Project Implementation

- a. The Contractor shall supply a project implementation plan including at least the following;
 - i. Site establishment
 - ii. Manpower plan
 - iii. Organogram

2.5.6 Manpower Requirements

- a. The number of maintenance staff required to execute the works is to be decided by the Contractor after his/her assessment of the scope of work and submitted to the Employer for approval.
- b. The successful Contractor shall utilise/provide skilled and suitably qualified staff with current experience in, but not limited to, the following disciplines;

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- i. Working knowledge of the SAP system
- ii. Occupational Health and Safety Act 85 of 1993
- iii. NEC contract management
- iv. Quality Management Control and Assurance procedures
- v. Spares optimisation
- vi. Procedure writing
- vii. BOM compilation
- c. Staff must meet minimum requirements of Eskom job descriptions, with additional requirements specified where applicable.
- d. All staff brought onto site in connection with this work scope should be able to fluently speak, understand, read and write in English.
- e. Proof of Contractor and staff qualifications is to be supplied on request by the Employer.
- f. The Contractor ensures that all staff being brought onto Kusile site have a valid fitness certificate based on the specified plant man-job specification.
- g. Provide daily supervision of all related plant through trained and competent personnel to ensure that inspections & work activities are conducted daily.

2.6 Process for Monitoring

Not Applicable

2.7 Related/Supporting Documents

Not Applicable

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3. Works information

3.1 Flue Gas Cleaning

3.1.1 Applicable Plant Area

Plant Area	Boundaries of Plant Area
Flue Gas Cleaning	<p>The Flue Gas Cleaning (PJFFP) is defined as the plant and equipment interfacing with flue gas, aux steam and ambient air that exist between the following points.</p> <ul style="list-style-type: none">-Exhaust outlet expansion joints of the air heaters to the inlet Expansion joints of ID Fan.-As well as the slide gate at the bottom of hopper separating it from Dust handling plant (10HDD11 AA502 to 10HDD41 AA502). <p>It has the following plants within its boundary</p> <ul style="list-style-type: none">- Attemperation air system- Emergency spray water system- Ventilation System- Pre-coating system- Implosion protection system- Hoppers- Pulsing system

3.1.2 Applicable S.O.W

- a) Inspection, testing, cleaning, maintenance and replacement of the following,
 - i. Emergency Spray Water system
 - ii. Attemperation Air system
 - iii. Pre-coating system
 - iv. Ventilation system
 - v. Pulsing system
 - vi. Aeration system
 - vii. Static gas mixers (Delta-Wing)

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- viii. Raw gas cell system
- ix. Clean gas cell system
- x. Raw gas Channel
- xi. Clean gas Channel
- xii. Implosion protection system
- xiii. Inspection doors
- xiv. Hoppers (including unblocking and emptying of Ash)
- xv. Ash discharge system
- xvi. Guide plates
- xvii. Changing Filter bags and Cages
- xviii. Cleaning of Cells (Vacuum using industrial machine, as and when required)
- xix. Cleaning of PJFFP all levels (as and when required)

NB! The Vacuum truck will be required from time to time to work on other plants.

3.2 Exclusions

- a. Scaffolding & Insulation
- b. Lubrication activities
- c. Non Destructive Testing
- d. Unauthorised Modifications
- e. Civil Maintenance
- f. Electrical Maintenance
- g. Control & Instrumentation Maintenance
- h. Condition monitoring
- i. Ducting's
- j. Expansion joints
- k. Compressors

4. Acceptance

This document has been seen and accepted by:

Name	Designation
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5. Revisions

Date	Rev.	Compiler	Remarks
February 2023	02	MM Kutumela	Revision 3
July 2019	02	NR Mokoena	Revision 2
November 2016	01	NR Mokoena	First issue

6. Development Team

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7. Acknowledgements

N/A

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