Eskom	**Specification**	**Kusile Power Station**

Title: **Kusile Power Station Inspection and Repair of Burners, PF Pipes and Fuel Oil Burners during Outages for a period of five (5) years**

Document Identifier:	**240-151683907**
Alternative Reference Number:	**N/A**
Area of Applicability:	**Kusile Power Station**
Functional Area:	**Outage Management**
Revision:	**2**
Total Pages:	**11**
Next Review Date:	**November 2029**
Disclosure Classification:	**Controlled Disclosure**

Content

Figures

1. Introduction

Kusile Power Station Management has taken a decision to outsource the burners, PF Pipes and fuel oil burners inspection and repair related scope to a suitably qualified, experienced and well-established Contractor. This document describes the detail of the applicable plant areas, scope of work, standards, quality, requirements, specifications, terms & conditions as well as the criteria to qualify for the tender.

2. Supporting Clauses

2.1 Scope

2.1.1 Purpose

The purpose of this document is to define the specified scope of work activity requirements for Kusile Power Station. The station is expected to perform at 85% UCF, 10% PCLF and 5% UCLF, and the specified burners, PF Pipes and Fuel Oil Burners Inspection and repair outage 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 Units that are commercially operational.

2.1.3 Effective date

Document is effective upon authorization.

2.2 Normative/Informative References

2.2.1 Normative

a. ISO 9001 Quality Management Systems
b. OHSACT Occupational Health and Safety Act, 85 of 1993
c. N. PSZ45-244 Pipe Support Standard
d. 240-5647004 Thermal Insulation standard
e. Specification for ceramic lined pulverised fuel pipe work.
f. 36-731 Specifications for fuel oil
g. NWS 1414- Fuel oil plants for fossil fired boiler protection functions, requirements and control measures.

2.2.2 Informative

Not Applicable

2.3 Definitions

Definition	Explanation
Contractor	Service provider contracted for supplying specific service to Eskom, Kusile Power Station.
Employer	Eskom, Kusile Power Station.
Employer Representative	Any person appointed in writing by Employer as the delegated Employer representative in terms of the provisions.
Plant	Any structure, machinery, apparatus or equipment which does not fall within the scope of the operating regulations for high voltage systems, and excludes, mobile, portable lifting equipment, domestic circuits' appliances and tools.

2.4 Abbreviations

Abbreviation	Description
OEM	Original Equipment Manufacturer
PCLF	Planned Capability Loss Factor
QCP	Quality Control Plan
SOW	Scope of Work
UCF	Unit Capability Factor
UCLF	Unplanned Capability Loss Factor
SSC	Submerged Scrapper Conveyor
QA	Quality assurance
QC	Quality Control
NDT	Non-Destructive Testing
PCM	Process Control Manual

2.5 Roles and Responsibilities

2.5.1 The Employer

The responsibilities of the Employer include the following:

a. Inform and issue the Contractor with the updated outage plan.
b. Ensure the SOW is issued to the Contractor in time to allow planning for the Outage.
c. Performance is measured by the Employer against those areas which contribute to the Employer's business and the Contractor shall be compensated accordingly as per the agreed contract clauses. (E.g., Reliability, Availability and Safety).
d. Areas of measurement include the Employer's key business indicators and will be redefined from time to time.
e. Employer to provide RP, AS training and certification
f. Employer will ensure that all materials (coal and debris) are cleaned before the Contractor gains access to the works.
g. Employer to provide NDT services to the contractor.
h. Spares to be supplied by the employer.
i. 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

The responsibilities of the Contractor include the following:

1) Comply with the Employer's Environmental, Health and Safety standards, policies, and procedures.
2) The Contractor shall compile improvement programmes to enhance plant performance and achieve cost reductions and the Employer will approve such programmes.
3) The Contractor shall be responsible for all mechanical repairs as per Employer's instructions, processes, and systems.
4) The Contractor will supply the machinery, tools, access ladders, DB boards, equipment, and consumables.
5) The contractor to ensure that the plant is cleaned prior to work commencing.
6) The Contractor must ensure that all spares preservation requirements are adhered to as per Employers requirements and procedures.
7) 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:
    a. Walkways
    b. Grating
    c. Handrails
    d. Cat ladders
    e. Hangers
    f. Supports etc.
8) The following complementary services to improve Plant and labour performance can be defined as follows:
    a. Project management
    b. Value engineering
    c. Procedure and documentation writing
    d. Compile and improve task lists.
    e. Implement approved design and modification
    f. Spares management
    g. Technical advice
    h. Operational and production process review
    i. Asset management in accordance with PAS55
    j. Component failure analysis reporting
9) 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.
10) The Contractor to 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.
11) 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.
12) 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.
13) All works will be subject to anytime inspection by the Employer.
14) The Contractor shall take cognisance of the fact that the contract start date can deviate.
15) The Contractor to provide resources required to execute this scope and any changes to the crew must be negotiated and agreed upon with the Employer.
16) The Contractor to assist the Employer when necessary, with utilisation of the rotable process in SAP for all refurbishable spares item. Employer to determine what should be repaired on site and what should be send away for repairs.
17) Contractor to provide rope access.

18) Spillage 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.
19) The Contractor shall ensure the integrity of plant labelling and that deficiency with regards to KKS labelling is reported immediately. All KKS removed during repairs to be put back in correct position.
20) The Contractor must ensure that they have responsible persons (in terms of PSR) for any work performed on plant. All technically qualified (above semi-skilled) Contractor's personnel will be trained and authorised (in terms of PSR) within 6 months of the contract start date.
21) The Contractor shall assist in the implementation, recommendations and corrective actions which are identified by the Kusile Power Station Condition monitoring programme.
22) The Contractor shall implement a program for continuous improvement to optimise plant performance and reduce system and equipment failures.
23) The Contractor shall participate in improvement programs as stipulated by the employer.
24) The contractor shall produce a final report within 10 working days after the date of completion of the whole of the works or any date agreed on as per Task Order
25) Contractor vehicles to comply with Eskom Vehicle Standards and Procedures.
26) During Outages it is expected that the contractor will provide on-site representation on a 24 hour basis, seven days a week if required. Shift times: 07h00 to 19h00, 19h00 to 07h00 or whichever times that will be agreed between two parties.
27) All additional personnel and scope of work to be clarified with the Employer prior to work being done.
28) Be able to make use of Primavera or any other project software for project tracking and reporting purposes.
29) Will be required to comply with the Employers process control manuals (PCM) that outlines the outage processes.

2.5.3 Re-commissioning

a. All Plant equipment maintained shall be re-qualified as per site specific procedure (237-0081) after any outage intervention.
b. The Contractor shall be responsible for any defects arising from outage/operational faults after an intervention, provided that the equipment has been placed into service.
c. The Contractor shall provide resources required for recommissioning of the plant after the works is completed in preparation for unit return to service.

2.5.4 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 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 to address any outage planning, execution, finalisation, or safety related matters.
e. Liaison meetings shall be held with the Employer's Representative or his/her delegate on as and when required basis to discuss any technical details, or concerns.

2.5.5 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, 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 while onsite.
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. Scaffolding Compliance
   v. Hazardous substances

2.5.6 Communication and Correspondence

a. All correspondence includes but not limited to:
   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 or as per the agreed contract terms.
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.

2.5.6 Quality and Documentation Control

a. During the tender process a quality criteria will be defined that the Contractor must comply to.
b. The Contractor to submit Quality Control Plans that has been developed for each task order for approval to Employer.
c. The Contractor to ensure that all measuring and test equipment is calibrated at all times & proof thereof must be readily available.
d. All Quality References and Standards as stipulated in this document will be adhered to.
e. The Contractor to comply with the Employer's quality documentation management system and processes.
f. The Contractor must be competent with the welding standards and procedures

2.5.7 Project Implementation

The Contractor shall supply an outage execution plan per outage including at least the following in Primavera or any other project plan acceptable to the Employer:

i. Site establishment
ii. Activities
iii. Manpower plan (Resource loaded)
iv. Organogram
v. Skills required and associated cost per skill (e.g., artisan, site manager, etc.)

2.5.8 Manpower Requirements

a. The number of personnel required to execute the works is to be proposed 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 experience in the technical aspects of this SOW and supporting teams.
c. All staff brought onto site in connection with this work scope should be able to fluently speak, understand and write in English.
d. Proof of qualification is to be supplied on request by the Employer for specific key resources.
e. All welding personnel are to be qualified as stated in the Eskom Standard which is stipulated in the reference documents.
f. The Contractor shall employ the services of a qualified welding & fabrication inspector, to inspect the works.
g. The Contractor ensures that all staff being brought onto Kusile site has a valid fitness certificate based on the specified plant man-job specification.
h. Provide daily supervision of all related plant through trained and competent personnel to ensure that inspections & work activities are conducted daily during execution of the outage.

2.6 Process for Monitoring

Process will be agreed by both parties per Task Order and according to Outage process control manuals and the specific outage SOW.

2.7 Related/Supporting Documents

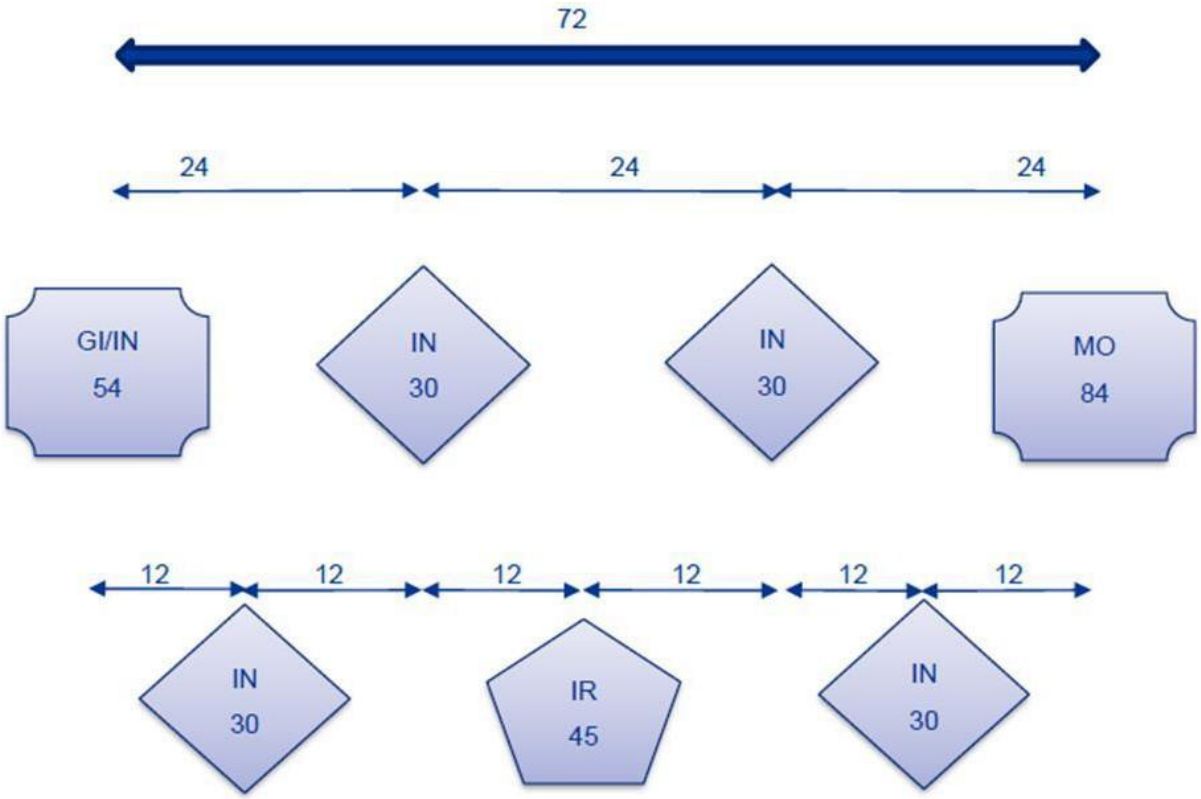
1. 240-86265448_Kusile Power Station Maintenance Execution Strategy for PF Pipes and burners
2. 240-151683907 Inspection and Repair of Burners, PF Pipes and Fuel Oil Burners during Outages at Kusile Power Station for a period of five (3) years
3. 240-81951984 Kusile Power Station Outage Philosophy

3. Document Content

3.1 Works Information

3.1.1 Outage Philosophy

The scope of work is for inspection and repair of burners, PF Pipes and fuel oil burners during outages at Kusile Power Station for a period of five (5) years. The system is also aligned to Kusile Power Station Outage Philosophy depicted as follows and gets reviewed yearly.



Symbol	Outage type	Interval Years	Interval Hours	Duration (days)	Main activities
	IN	1	8333	30	Boiler and Draught Group inspection Mill bin inspection Absorber, Inlet & Outlet Duct, Emergency Quenching Nozzles, Mist Eliminators, Oxy-Blower and Reaction Tanks - Cleaning, Inspection and Refurbishment
	IN	2	16666	30	Boiler and Draught Group inspection Mill bin inspection Absorber, Inlet & Outlet Duct, Emergency Quenching Nozzles, Mist Eliminators, Oxy-Blower and Reaction Tanks - Cleaning, Inspection and Refurbishment
	IR	3	25000	45	LP Bypass Valves inspection and repairs Boiler and turbine auxiliaries inspection and repairs Absorber, Inlet & Outlet Duct, Emergency Quenching Nozzles, Mist Eliminators, Oxy-Blower and Reaction Tanks - Cleaning, Inspection and Refurbishment
	MGO	6	50 000	84	HP and IP turbine cylinders full refurbishment. LP cylinder and Valves overhaul Boiler statutory inspections Generator stator and rotor inspections Absorber, Inlet & Outlet Duct, Emergency Quenching Nozzles, Mist Eliminators, Oxy-Blower and Reaction Tanks - Cleaning, Inspection and Refurbishment
	GO	12	100 000	84	HP, IP, LP Turbine cylinders and Valves overhaul Air heater element packs will be replaced every 12 years Boiler statutory inspections Absorber, Inlet & Outlet Duct, Emergency Quenching Nozzles, Mist Eliminators, Oxy-Blower and Reaction Tanks - Cleaning, Inspection and Refurbishment

Figure 1: Kusile Outage Philosophy

3.1.1.1 Applicable Plant Area

Plant Area	Boundaries of Plant Area
Fuel Oil Burner	**Fuel oil** - inlet of Fuel oil from isolation **v/v (10HJF10AA502)** to the burner tip. **LPG System**- inlet of LPG from the isolating **v/v (10HJG01AA503)** to the igniter. **Steam supply** - inlet of steam from the isolating **v/v (1OHJM15AA501)** to the burner nozzle. Inclusions (LPG Igniter and Fuel Oil Igniter).
PF Pipes & burners	Mill classifier outlet till burners. Inclusions (Burners, PF Pipes and PF isolating gate)

3.1.1.2 Applicable S.O.W (Fuel Oil Burners)

a. Inspection, cleaning of oil burner lances. Replace if necessary.
b. Fuel oil filters cleaning, ignition gas filters, atomizing steam filters, instrument air filters and burner retracting pneumatic device air filters (boiler units).
c. Functional Testing of pneumatic cylinders.
d. Inspection and pressure testing of flexible hose.
e. Inspection of oil burner guide tube for erosion.
f. Inspection of LPG igniter guide tube and igniter tube for erosion.
g. Ignition and cooling air fan Silencer cleaning.
h. Inspection and lubrication of valves.
i. The repair SOW to be firmed up after the inspection report.

3.1.1.3 Applicable S.O.W (PF Pipes and Burners)

a) Inspection of PF pipes, support hangers, expansion joints and bends. Replace/Repair if necessary.
b) Inspection of pipe wear protection (Tiles).
c) Installation of tiles, if necessary.
d) PF pipes Elevation surveys.
e) Endoscopic assessment of pipes.
f) Visual inspection for corrosion, erosion, and mechanical damage of the DS burners. Replace/Repair if necessary.
g) Cleaning of optical lenses on flame detectors.
h) Crack inspections and repairs for burner stabilising ring.
i) Replace all door seals and flange gaskets.
j) The repair SOW to be firmed up after the inspection report.
k) Add wear material (Shielding) on areas identified by the employer
l) Inspection of all burner swirlers (PF, SA, TA and CA) Functionality must be ensured
m) Inspection of all burner scrolls.
n) Inspection of the 3 way damper.

3.1.2 Exclusions

a. Scaffolding and Insulation
b. Electrical and Control & Instrumentation components
c. Condition Monitoring
d. Lubrication
e. Unauthorised modifications
f. Civil Maintenance
g. Supply of spares

4. Acceptance

This document has been seen and accepted by:

5. Revisions

Date	Rev.	Compiler	Remarks
March 2024	2		
November 2019	1		

6. Development Team

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

7. Acknowledgements

Not Applicable