

	<b>Specification</b>	<b>Kusile Power Station</b>
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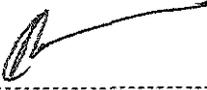
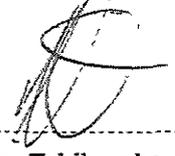
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## 1. Introduction

Kusile Power Station Management has taken a decision to outsource Dust Handling Plant System outage 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 92% UCF, 6% PCLF and 2% UCLF, and the specified Dust Handling Plant System 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

- 1) ISO 9001 Quality Management Systems
- 2) OHS ACT Occupational Health and Safety Act, 85 of 1993
- 3) 240-81951984 Kusile Outage Philosophy

#### 2.2.2 Informative

- 1) 240-92358661 Dust handling Plant Maintenance Strategy
- 2) 0.90/38743, Sheet 1 of 2 – Dust Handling and Conditioning Plant PJFFP Conveying – Unit 1 P&ID, Rev 10
- 3) 0.90/38743, Sheet 2 of 2 – Dust Handling and Conditioning Plant PJFFP Conveying – Unit 1 P&ID, Rev 10
- 4) 0.90/38749, Dust Handling and Conditioning Plant Unit 1 - PJFFP Aeration P&ID, Rev 10

### 2.3 Definitions

- 1) **Contractor:** Service provider contracted for supplying specific service to Eskom, Kusile Power Station

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- 2) **Employer:** Eskom, Kusile Power Station
- 3) **Employer Representative** Any person appointed in writing by Employer as the delegated Employer representative in terms of the provisions.
- 4) **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
DHP	Dust Handling Plant
C&I	Control and Instrumentation
FMA	Failure Mode Analysis
HP	High Pressure
IP	Intermediate Pressure
IR	Interim Repairs
ISO	International Standardisation Organisation
LP	Low Pressure
MD-Pump	Multiple Discharge Pump
NDT	Non Destructive Testing
OEM	Original Equipment Manufacturer
PCLF	Planned Capability Loss Factor
PCM	Process Control Manual
PJFFP	Pulse Jet Fabric Filter Plant
PM	Preventative Maintenance
PSR	Plant Safety Regulation
PTW	Permit to Work
QA	Quality assurance
QC	Quality Control
QCP	Quality Control Plan
RBO	Reliability Basis Optimisation
SAP	System Applications Products
SE	System Engineer
SOW	Scope of Work
STL	Standard Task List
UCF	Unit Capability Factor
UCLF	Unplanned Capability Loss Factor
VSD	Variable Speed Drive

## 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 (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

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- e) Employer shall provide training for PSR, and any other training as deemed necessary by the Employer in line with the scope requirements.
- f) Employer to provide NDT services to the Contractor
- g) 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) The Contractor shall 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 works as per Employer's instructions, processes and systems
- 4) The Contractor shall be responsible for the inspection, maintenance, and replacement of all mechanical and structural equipment as detailed on the SOW
- 5) The Contractor shall ensure that all nameplates, KKS and safety signs are fitted to all mechanical and structural equipment
- 6) The Contractor must ensure that all spares preservation requirements are adhered to as per Employers requirements and procedures
- 7) The Contractor shall ensure that all platforms, gratings, handrails and cat ladders removed by him/her are thereafter re-instated into original base as per structural standards.
- 8) The Contractor is 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
- 9) The Employer shall inform the Contractor as soon as possible of any changes to the main activity schedule (programme of notifications) which might affect the activity plan of the contractor
- 10) 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
- 11) The Contractor shall employ a competent person who is accredited and responsible to perform all maintenance work with regards to this SOW
- 12) All works will be subject to anytime inspection by the Employer
- 13) The Contractor shall take cognisance of the fact that the contract start date can deviate
- 14) 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.
- 15) The Contractor to return all refurbishable spares to Kusile stores for Material Management to send out for refurbishment Employer to determine what should be repaired on site and what should be sent away for repairs.
- 16) This contract is for outage SOW and any other breakdowns that the Contractor will be required to perform within the scope boundaries of this contract
- 17) 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
- 18) The Contractor shall perform leak checks on all responsible plant areas (Pneumatic conveying system) and inform the Employer's representative accordingly.

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- 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) Contractors personnel will be trained and authorised (in terms of PSR) within 6 months of the contract start date by the Employer
- 21) The Contractor to provide equipment and tools required for the works
- 22) The Contractor shall assist in the implementation, recommendations and corrective actions which are identified by the Kusile Power Station Condition monitoring programme
- 23) The Contractor shall participate in improvement programs as stipulated by the employer
- 24) The contractor shall produce a final report within 30 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 12 hour basis, seven days a week if required
- 27) All additional personnel and scope of work to be clarified with the Employer prior to work being done
- 28) Be in a position to make use of Primavera or any other project software agreed with the Employer for project tracking and reporting purposes
- 29) The contractor will be required to comply with the Employers process control manuals (PCM) that outlines the outage processes.
- 30) The Contractor shall employ a competent person who is accredited and responsible to perform all statutory plant tests with regards to this SOW
- 31) All statutory tests or inspections done by the Contractor shall be reviewed and accepted by the Employer
- 32) The Contractor shall be responsible for statutory inspections/tests as defined by the Employer and supply the Employer with proof of such tests
- 33) The contractors to ensure that NDT test is executed were applicable

### **2.5.3 Re-commissioning**

- a) All Plant equipment maintained shall be re-qualified after any outage intervention.
- b) The Contractor shall be responsible or held liable for any defects arising from outage/operational faults after an intervention, provided that the equipment has been placed into service. The defect liability period is 52 weeks after outage completion
- 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 in order to address any outage planning, execution, finalisation or safety related matters

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- 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. Cherry Pickers
- 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.
- d) The Contractor shall communicate with the Employer by form of telephone and writing

#### **2.5.7 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 compile a specific outage quality management plan for specific SOW and will be approved by the Employer's delegated person, usually the System Engineer

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- c) The Contractor shall ensure that any witness, hold and inspection points are strictly adhered to
- d) The Contractor to ensure that all measuring and test equipment is calibrated at all times & proof thereof must be readily available
- e) All Quality References and Standards as stipulated in this document will be adhered to
- f) The Contractor to comply with the Employer's quality documentation management system and processes

#### **2.5.8 Project Implementation**

- a) 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)

#### **2.5.9 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 ensures that all staff being brought onto Kusile site has 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 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**

- a 240-92358661 Dust handling Plant Maintenance Strategy

#### **3. Works information**

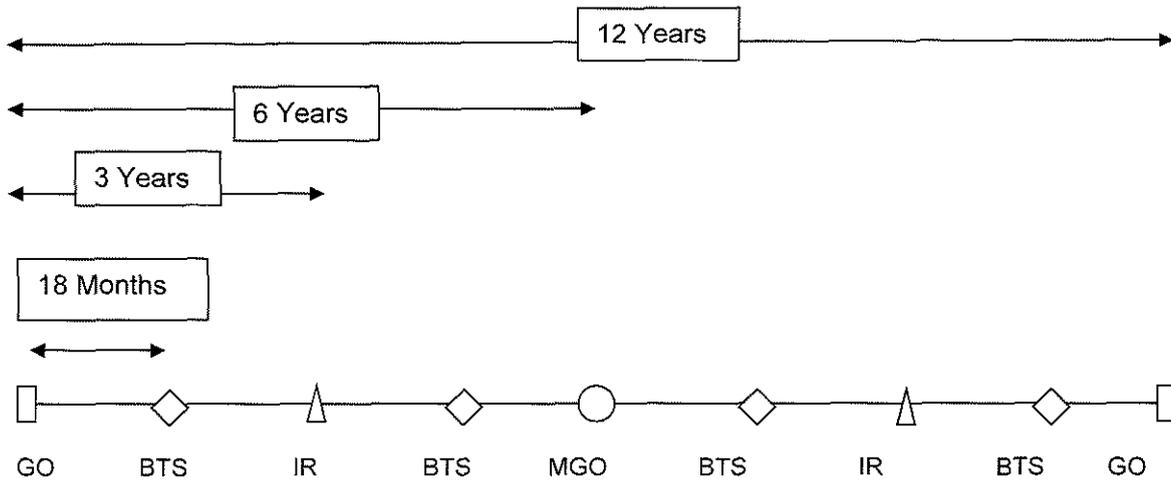
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### 3.1 Outage Philosophy

The scope of work is applicable to the Dust Handling Plant as and when required as per scope of work. 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
◇	BTS	1,5	12 500	14	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	25 000	35	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	42	LP cylinder 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	56	HP, IP and LP cylinder overhaul Absorber, Inlet & Outlet Duct, Emergency Quenching Nozzles, Mist eliminators, Oxy-Blower and Reaction Tanks-Cleaning, Inspection and Refurbishment

Figure 1 Kusile Outage Philosophy

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### 3.2 Applicable S.O.W

Plant Area	Boundaries of Plant Area
DHP	The dust handling plant is defined as the plant and equipment interfacing with ash, that exists between the following points, a Outlet from PJFFP hopper, including(1-6 0HDD11-17; 1-6 0HDD21-27, 1-6 0HDD31-37, 1-6 0HDD41-47) the knife gate b Pneumatic conveying system ETG & ETP( MD pumps, vent lines, piping, compressor distribution system and valves) c. Conveying system pipes to fly Ash Silo inlet dome valve

The SOW for this contract is detailed as follows:

The work will include all planned outages and unplanned outages as per scope of work.

Detailed SOW of Dust Handling Plant System

- o Inspect, refurbish or replace the blowers and associated components if necessary.
- o All dome valves must be replaced (DV80, DV250 and DV300)
- o All gaskets must be replaced if necessary
- o All non-return valves to be replaced
- o Inspect and replace all pressure relief valves
- o Inspect and replace all pressure regulating valves
- o Inspect and replace all conveying pipes
- o Inspect and replace all fluidizing rubber pipes
- o Inspect and replace all hopper aeration heaters and valves
- o Replace all air supply valves and associated fittings
- o Replace all bellows and square to round
- o Replace all MD pumps
- o Pressure test all pressure equipment associated with the Dust Handling Plant
- o Inspect and replace hopper aeration pads
- o Execute any defect that has been picked up during inspections

### 3.3 Exclusions

- a) Scaffolding and Insulation
- b) Electrical and Control and Instrumentation components
- c) Non-destructive testing
- d) Condition Monitoring
- e) Lubrication
- f) Unauthorised modifications
- g) Civil Maintenance
- h) Supply of spares

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#### **4. Acceptance**

This document has been seen and accepted by

<b>Name</b>	<b>Designation</b>
Neo Seshauka	Middle Manager Outages
Siyabonga Mahaye	Manager Outage Execution
Sinothi Buthelezi	Auxiliary Engineering Manager
Justice Tshikomba	Engineering Group Manager

#### **5. Revisions**

<b>Date</b>	<b>Rev.</b>	<b>Compiler</b>	<b>Remarks</b>
July 2019	1	Isaac Netshiozwi	First issue
July 2019	1	Sherperd Dibakoane	First issue

#### **6. Development Team**

The following people were involved in the development of this document

Isaac Netshiozwi

Sherperd Dibakoane

#### **7. Acknowledgements**

Not Applicable

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