Eskom	**Scope of Work**	**Kusile Power Station**

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1. Introduction

Kusile Power Station makes use of Blowers predominantly at the Ash and Water Plants for the support of the electricity generation process. All our Ash silos uses blowers to discharge ash from the Silo to the conditioners. We also use Blowers to fluidise the Ash Hoppers before conveying it to the Silos. Blowers are also used in the water treatment process for the station.

The Blowers are classified as refurbishable items according to the spares strategy. They therefore require periodic repairs and or overhaul as they contain wearing elements.

2. Supporting Clauses

2.1 Scope

2.1.1 Purpose

The purpose of this document is to give a detailed scope of work for the procurement of services for the Kusile Power Station Blower Refurbishment Contract

2.1.2 Applicability

This document shall apply to Kusile Power Station.

2.1.3 Effective date

This document is effective from the date when the authorised signatory has signed the document.

2.2 Normative/Informative References

2.2.1. Normative References

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

In the References below several references are made to foreign legislation. For work on Eskom plant the relevant South African Acts and Regulations shall be consulted and applied.

[1] ISO 9001 Quality Management Systems

2.2.1 Informative References

[1] 240-85864602 Kusile Power Station Maintenance Execution Strategy for Boiler Bottom Ash Removal Plant

[2] 240-105952260-Kusile Power Station Bottom Ash Operating Technical Specifications

[3] 240-106692345_Kusile Power Station – Maintenance Spares Strategy for Boiler Bottom Ash Removal Plant

[4] 240-92358661 - Kusile Power Station Maintenance Execution Strategy for the Dust Handling and Conditioning Plant System

2.3 Definitions

None

2.4 Abbreviations

Table 1: List of Abbreviations

Abbreviation	Explanation
BMCR	Boiler Maximum Capacity Rating
C&I	Control and Instrumentation
EC&I	Electrical, Control and Instrumentation
EMD	Electrical Maintenance Department
MW	Megawatt
PS	Power Station
QCP	Quality control plan
SOW	Scope of Work
TPH	Tons per hour

2.5 Roles and Responsibilities

Department	Designation
Engineering	○ Compile the Technical Evaluation ○ To facilitate the Engineering interfacing and lead the Engineering change
Maintenance	o End user for maintenance o Compile the Scope of Work for the maintenance department
Procurement	o Develop commercial strategy o Tender management o Supplier selection o Contract management
Materials Management	o Consolidate project strategy o Manage schedule, cost and quality o Resource plan o All other disciplines
Quality	o Manage the quality control plans o Manage Risks

2.6 Process for Monitoring

None.

2.7 Related/Supporting Documents

[1] 32-92 Public Finance Management Reporting Procedure

3. Scope of Work

The scope is for the refurbishment of Blowers at Kusile Power Station, the details are listed below. The scope is for the collection of the damaged Blower at Kusile Main Stores (GE Stores), strip, clean, assess the damages on the Blower. The Contractor shall issue a repair report that will be evaluated and agreed upon by the responsible Technician and Engineer before the repairs commence.

3.1 General Blower Mechanical Repair Specifications

3.1.1 All Blowers or assemblies will be:

- Completely disassembled.
- Hot Tank Stripped.
- Cleaned, wire brushed of all rust and grease. Casing shall be sandblasted
- Inspected and/or tested as follows:
    - Measure all "fits" and compare with original drawing dimensions. Provide photographs and/or sketches for assembly.
    - Casings, housings, etc. - will be visually inspected for cracks and other signs of wear.
    - Shafts & Gearing - visually inspect and dimensionally checked, for possible reuse.

3.1.2 A detailed line by line quotation of all work required to recondition the assembly/Blower will be prepared and include:

- Listing of any new parts required.
- Summary of required procedures to return reusable parts to print specification.
- Summary of price for all materials to complete the works. Labour cost must be included in the component and material pricing.

3.1.3 An Eskom Representative (Technician or Engineer) shall approve the repair scope prior to any work proceeding.

- The Contractor shall give a one-year warranty for all replaced parts, bearings, and seals as recommended in the repair scope and quote.
- The Contractor shall give a one-year warranty for workmanship for all machined parts and assembling work done.

3.1.4 Eskom's Repair Specifications:

3.1.4.1 Fits

- All fits shall be returned to original size and relative centers using either; plating, sleeving and/or welding and machining as approved by an Eskom Representative.

3.1.4.2 Shafting

- Repair may be made by plating and grinding, or machining and sleeving.
- Will be straight and finished in accordance with tolerances and finish specifications as indicated on appropriate drawings.
- New shafting provided will match the specifications and dimensions of the original part as per OEM drawings.
- Exposed threads, shaft ends and couplings will be protected with an anti-rust protection coating prior to shipping the blower for site delivery.

3.1.4.3 Gearing

- Will be dimensionally inspected to Eskom's approved drawings, manufacturers' drawings, and or reverse engineered.
- New gearing provided will meet or exceed the specifications and dimensions of the original parts as per Eskom's and/or OEM drawings.

3.1.4.4 Casings, Housing, etc.

- Fits - All fits will be returned to original size and relative centers using either; sleeving and/or welding and machining as approved by Eskom's Representative
- All bolts, studs, pipe plugs, and other fittings will be removed and the holes re-tapped as necessary.
- Bolts, studs, and pipe fittings may be reused if in good condition.
- Replacement bolts, studs, and pipe fittings will be of the same grade and material unless otherwise specified.
- Eskom Representative shall approve any drawing modifications prior to implementation.

3.1.4.5 Assembly and Test Procedures

- All seals, shims, and gaskets will be replaced
- All bearings will be replaced.
- All hardware such as shafts and gears will be reused or replaced depending upon condition.
- All repaired and overhauled units will be test run to check contact patterns, clearances, backlash, and freedom of movement.
- When pressure lubricated units are involved, the Contractor shall pressure test the units in the presence of an Eskom Representative.
- A standing leak test shall be performed on all repaired units and witnessed by an Eskom's Representative before delivery to site.

3.1.4.6 Painting and Identification

- All Blowers shall have:
  - Exterior surfaces cleaned of all loose scale and rust.
  - Entire Housing surfaces cleaned and sandblasted of all dirt and oil.
  - One coat of light blue enamel applied on the exterior, unless otherwise specified by the Eskom Representative.
  - A new identification tag will be installed to each overhauled blower with the following information:
    - Date overhauled
    - Contractor job number
    - Eskom's purchase order number
- The details of the OEM shall be preserved for Eskom's future reference

3.1.4.7 Shipment

- All openings are properly protected with plugs or cover.
- All units are shipped dry from the Contractor's workshop. The unit shall be marked to indicate that lubricant must be added prior to operation.

3.1.4.8 Run Test Procedure

1. Firmly mount Blower to be tested to the test run stand.
2. Fill the unit with the OEM recommended lubricant.
3. Attach the oil pumping station to the unit if required.
4. Hook up all run test equipment.
5. Check and document temperature.
6. Start the test run motor and set variable RPM to the Blower requirements.
7. Attach Blower to test run motor and record decibel reading during test run.
8. Check all sealed areas for any oil leakage.
9. Blower bearing temperature will be checked and documented at several intervals during testing.
10. Vibration and other non-destructive testing as per Eskom's requirements to be performed.

3.2 Blowers Bill of Quantities

Item	Material or Stock Number	Parent Equipment	Applicable Functional Location (KKS)	Detailed Design Characteristics	Applicable Drawing Nr	Quantity Installed in Plant	RF Quantity
1	**662103**	**Ash Silo Aeration Blower**	**X 0ETP20 AN002**	**BLOWER, ELECTRICAL: TYPE: LOW PRESSURE; CAPACITY: 1080 NM3/H; SIZE: 30 MM; POTENTIAL: 400-690 V; CURRENT: 40 A; POWER: 22 KW; ROBOX EVOLUTION-RBS46ES-46/2P-RVP80-HT-SNT; 22KW-2P-40A-3PH-IP55-180M-B3; RBS46 SIZE 2(SHAFT DIA: 38MM)**		**8**	**40**
				Sandblasting and Cleaning of Blower Casing		1	40
				Painting of the Blower After Repairs		1	40
				Casing (Top and Bottom and Including All Screws)		1	40
				Casing Inspection Cover and Screws		1	40
				Filter and fittings		1	40
				Input Shaft Assembly, Including Helical Bevel Gear with Keyway and Screws		1	40
				Input Shaft Oil Seals		2	80
				Drive Lubricating Disc		1	40
				Sealing Chamber		4	160
				Oil splash disc		4	160
				Key		1	40
				Internal ring		1	40

				Flexible Ring		1	40
				Drive Compress Ring		6	240
				Compress Ring		1	40
				Washer D10		20	1600
				Washer D8		4	160
				Shim Plate		4	160
				Washer A10.5		1	40
				Driving Gear		1	40
				Driven Gear		1	40
				Gear Spacer		1	40
				Sandblasting and Cleaning of Blower Casing		1	40
2	**636521**	**UF Backpulse Blower 11**	**0 0GBP11 AN001**	**BLOWER: TYPE: ROOTS; CAPACITY: 2870 NM3/H; SIZE: DN 250; POTENTIAL: 400/690 VAC; CURRENT: 129-74.8 A; POWER: 61.88 KW;**		**2**	**10**
				Sandblasting and Cleaning of Blower Casing		1	10
				Painting of the Blower After Repairs		1	10
				Casing (Top and Bottom and Including All Screws)		1	10
				Casing Inspection Cover and Screws		1	10
				Filter and fittings		1	10
				Input Shaft Assembly, Including Helical Bevel Gear with Keyway and Screws		1	10

				Input Shaft Oil Seals		2	20
				Drive Lubricating Disc		1	10
				Sealing Chamber		4	40
				Oil splash disc		4	40
				Key		1	10
				Internal ring		1	10
				Flexible Ring		1	10
				Drive Compress Ring		6	60
				Compress Ring		1	10
				Washer D10		20	200
				Washer D8		4	40
				Shim Plate		4	40
				Washer A10.5		1	10
				Driving Gear		1	10
				Driven Gear		1	10
				Gear Spacer		1	10
3	**636522**	**CPP Regeneration Blower 31**	**0 0LDP31 AN001**	**BLOWER: TYPE: ROOTS; CAPACITY: 300 NM3/H; SIZE: DN 100; POTENTIAL: 400/690 VAC; CURRENT: 20.4-11.8 A; POWER: 7.9 KW;**		**3**	**15**
				Sandblasting and Cleaning of Blower Casing		1	15

				Painting of the Blower After Repairs		1	15
				Casing (Top and Bottom and Including All Screws)		1	15
				Casing Inspection Cover and Screws		1	15
				Filter and fittings		1	15
				Input Shaft Assembly, Including Helical Bevel Gear with Keyway and Screws		1	15
				Input Shaft Oil Seals		2	30
				Drive Lubricating Disc		1	15
				Sealing Chamber		4	60
				Oil splash disc		4	60
				Key		1	15
				Internal ring		1	15
				Flexible Ring		1	15
				Drive Compress Ring		6	90
				Compress Ring		1	15
				Washer D10		20	300
				Washer D8		4	60
				Shim Plate		4	60
				Washer A10.5		1	15
				Driving Gear		1	15
				Driven Gear		1	15
				Gear Spacer		1	15

4	**636523**	**Mixed Bed Blower 11**	**0 0GCP11 AN001**	**BLOWER: TYPE: ROOTS; CAPACITY: 1400 NM3/H; SIZE: DN 150; POTENTIAL: 400/690 VAC; CURRENT: 80.7-46.8 A; POWER: 34.74 KW**		**2**	**10**
				Sandblasting and Cleaning of Blower Casing		1	10
				Painting of the Blower After Repairs		1	10
				Casing (Top and Bottom and Including All Screws)		1	10
				Casing Inspection Cover and Screws		1	10
				Filter and fittings		1	10
				Input Shaft Assembly, Including Helical Bevel Gear with Keyway and Screws		1	10
				Input Shaft Oil Seals		2	20
				Drive Lubricating Discs		1	10
				Sealing Chamber		4	40
				Oil splash discs		4	40
				Key		1	10
				Internal ring		1	10
				Flexible Ring		1	10
				Drive Compress Ring		6	60
				Compress Ring		1	10
				Washer D10		20	200

				Washer D8		4	40
				Shim Plate		4	40
				Washer A10.5		1	10
				Driving Gear		1	10
				Driven Gear		1	10
				Gear Spacer		1	10
5	**623354**	**Neutralisation System Blower 41**	**0 0GDK41 AN001**	**BLOWER, ELECTRICAL: TYPE: ROOT; CAPACITY: 500 NM3/H; SIZE: 100 MM; POTENTIAL: 380/660 V; CURRENT: 40.9-23.5 A; POWER: 20.9 KW;**		**2**	**10**
				Sandblasting and Cleaning of Blower Casing		1	10
				Painting of the Blower After Repairs		1	10
				Casing (Top and Bottom and Including All Screws)		1	10
				Casing Inspection Cover and Screws		1	10
				Filter and fittings		1	10
				Input Shaft Assembly, Including Helical Bevel Gear with Keyway and Screws		1	10
				Input Shaft Oil Seals		2	20
				Drive Lubricating Discs		1	10
				Sealing Chamber		4	40
				Oil splash discs		4	40
				Key		1	10
				Internal ring		1	10

				Flexible Ring		1	10
				Drive Compress Ring		6	60
				Compress Ring		1	10
				Washer D10		20	200
				Washer D8		4	40
				Shim Plate		4	40
				Washer A10.5		1	10
				Driving Gear		1	10
				Driven Gear		1	10
				Gear Spacer		1	10
6	**662104**	**PJFFP Aeration Blower**		**BLOWER, ELECTRICAL: TYPE: POSITIVE DISPLACEMENT; CAPACITY: 4514 NM3/H; SIZE: 30 MM; POTENTIAL: 400 V; CURRENT: 94 A; POWER: 55 KWP/N: 280RAM-X-JOB-SJ8447; TRIBUTE RAM 280 ROTARY; 55KW-2P-3PH-IP55-B3-250S-PPA-250S60-2**		**12**	**60**
				Sandblasting and Cleaning of Blower Casing		1	60
				Painting of the Blower After Repairs		1	60
				Casing (Top and Bottom and Including All Screws)		1	60
				Casing Inspection Cover and Screws		1	60
				Filter and fittings		1	60

				Input Shaft Assembly, Including Helical Bevel Gear with Keyway and Screws		1	60
				Input Shaft Oil Seals		2	120
				Drive Lubricating Discs		1	60
				Sealing Chamber		4	240
				Oil splash discs		4	240
				Key		1	60
				Internal ring		1	60
				Flexible Ring		1	60
				Drive Compress Ring		6	360
				Compress Ring		1	60
				Washer D10		20	1200
				Washer D8		4	240
				Shim Plate		4	240
				Washer A10.5		1	60
				Driving Gear		1	60
				Driven Gear		1	60
				Gear Spacer		1	60
7		**Sewage Treatment Plant**	**00GRQ10AN001KN01 00GRQ20AN001KN01**	**Positive displacement, Bare-shaft air blower, Universal URAI 56 C/W. Duty - 258 Nm3/hr at 65 kPa(g)**		**2**	**10**

				Sandblasting and Cleaning of Blower Casing		1	10
				Painting of the Blower After Repairs		1	10
				Casing (Top and Bottom and Including All Screws)		1	10
				Casing Inspection Cover and Screws		1	10
				Filter and fittings		1	10
				Input Shaft Assembly, Including Helical Bevel Gear with Keyway and Screws		1	10
				Input Shaft Oil Seals		2	20
				Drive Lubricating Discs		1	10
				Sealing Chamber		4	40
				Oil splash discs		4	40
				Key		1	10
				Internal ring		1	10
				Flexible Ring		1	10
				Drive Compress Ring		6	60
				Compress Ring		1	10
				Washer D10		20	200
				Washer D8		4	40
				Shim Plate		4	40
				Washer A10.5		1	10
				Driving Gear		1	10

				Driven Gear		1	10
				Gear Spacer		1	10

4. Battery Limits

The scope shall be carried out off site and delivery to be made to the Kusile Power Station warehouse

5. Acceptance

This document has been seen and accepted by:

6. Revisions

Date	Rev.	Compiler	Remarks

Date	Rev.	Compiler	Remarks

7. Development Team

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

8. Acknowledgements

None.