Eskom	Specification	Medupi Power Station

Title: **Medupi Power Station DHP Blowers Supply and Refurbishment Scope of Works**

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Content Page

Tables

1. Introduction

The Medupi Power Station Dust Handling & Conditioning Plant (DHP) makes use of Blowers across the plant for various processes, including fly ash aeration in the PJFFP Hoppers, Fly Ash Silos and airslides. These Blowers are regarded as essential components within DHP to ensure consistent removal of Fly Ash from the station.

These blowers are subject to increased wear and tear due to the aggressive operating environment. As such, Medupi is in the need to establish a contract for the supply as well as refurbishment of different Blowers for the Dust Handling and Conditioning Plant.

2. Supporting Clauses

2.1 Scope

Supply of new spares as well as the refurbishment of various Blowers, installed at Medupi Power Station for a period of 5 years.

2.1.1 Purpose

The purpose of this document is to give the Scope for the Supply of new spares as well as the refurbishment of Blowers, installed on the Medupi DHP.

2.1.2 Applicability

This document shall apply to the Medupi Power Station.

2.1.3 Effective date

The effective date of this document is the date of authorisation.

2.2 Normative/Informative References

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

2.2.1 Normative

[1] ISO 9001 Quality Management Systems

[2] Environmental Incident Management Procedure - 240-133087117

[3] ESKOM SHEQ Policy 32-727

[4] Life Saving-Rules – 240-62196227 Medupi Power Station - SHE File Evaluation Checklist - 240-97661287

[5] Medupi Power Station Working at Heights Work Instruction - 240-135676724

2.2.2 Informative

N/A

2.3 Definitions

Definition	Explanation
Contractor	Service provider contracted for the works as specified in this scope
Employer	Eskom Medupi Power Station

2.4 Abbreviations

Abbreviation	Explanation
DHP	Dust Handling Plant
IP	Intellectual Property
OEM	Original Equipment Manufacturer
QCP	Quality Control Plan
SOW	Scope of Works

2.5 Roles and Responsibilities

Maintenance is responsible for quality control on delivery of Blowers and related spares as well as to ensure damaged components are booked back into stores for refurbishment.

Engineering will be responsible for the approval of quality control plan for refurbishments and will form part of the quality control process.

Commercial will be part of the contract placement process and communication with the contractor until contract award.

Materials Management is responsible to manage the contract in line with this SOW.

2.6 Process for Monitoring

This document will be a once-off document to state the scope of work.

2.7 Related/Supporting Documents

N/A

3. Scope of Work

The scope is for the supply of various Blowers and refurbishment of damaged Blowers installed on the DHP at Medupi Power Station for a period of 5 years on an 'as-and-when-required' basis.

3.1 Supply of Spares

The Works include the following:

1. The description of the spares and the quantities that the *Employer* envisages for the duration of the contract is indicated in Table 1. This value will be used with other estimates to determine the overall contract value. It should be noted that this is just an estimate, and it does not mean that the *Employer* will definitely consume the spares in the duration of the contract. These quantities are therefore not fixed, and the *Contractor* will only supply spares when instructed by a purchase order, from the *Employer*, to do so.
2. Where the contractor is not the OEM of a specific Blower, the handling fee is indicated in table 1, if applicable. Spares that are not included in the list will be supplied as part of the "Miscellaneous spares not specified" portion, as indicated in Table 2 below.
3. The spares and components will be supplied to the "goods received" section of the Medupi main store where it will be received by the material management section. The spares will be delivered with all the required data books and certificates, where required.
4. Medupi Stores Working Times: Monday – Thursdays: 07h00 – 16h00
   Fridays: 07H00 – 12h00
5. A draft QCP shall be submitted, with hold-and-witness points specified, for review by the *Employer* prior to manufacturing.
6. The *Employer* shall be given sufficient notice by the *Contractor* of any witness and hold points identified for adherence in the QCP. These points may be waived by the *Employer* from time to time depending on technical staff availability. Otherwise, it may be requested that photographic or other evidence be submitted electronically, for review and approval, before continuing with the manufacturing / assembly.
7. Hardcopies as well as electronic copies of the Blower manufacturing Data Book shall be supplied to the *Employer* with or before the delivery of any new spare Blower. This Data Book will be used during on site Quality Control checks to do final Quality acceptance of refurbished items or spares delivered. Spares delivered without its required documentation will be rejected.
8. The manufacturing Data Book shall contain as a minimum, but shall not be limited to, approved quality control plan, material certificates, Performance test report, vibration analysis report as well as non-destructive testing reports as required.
9. Only once the spares have passed the Quality Control checks and are booked into the system can payment be affected.
10. The Spares must be the same in all respects when compared to the description under this Scope of Work. This includes all aspects such as design, materials and material specifications, manufacturing, including manufacturing processes, calibration certificates and acceptance testing. Where spares offered deviate from the original in any respect, it should be indicated to the *Employer* upon quotation/query.
11. It is the *Contractor's* responsibility to ensure that correct spares are delivered. If the incorrect spares are delivered, the spares will have to be replaced with the correct spares at the *Contractor's* cost. This includes transport and delivery.

12. The Delivery and Transport Costs must be included in the list of Prices quoted.
13. The following packaging requirements should be adhered to:
    a) The Goods are to be packaged in such a manner that it can be transported and stored for an extended period without resulting in damage to the goods.
    b) This includes damage due to moisture ingress, corrosion, vibration from the power station etc.
    c) Where lifting gear is utilised to move the goods, the packaging should allow the lifting operation and ensure that the goods are not damaged in any way during the process.
    d) It will also not be necessary to open packaging for any lifting or transport operation.
    e) Where eye bolts are fitted to move the goods, these eye bolts should be fitted such a way that they can be easily removed and replaced with the *Employers*' eye bolts, ensuring that the packaging stays intact.
    f) Packaging and labelling of the Blowers should ensure that the spare can be identified without opening the packaging.
    g) Delivery packaging to have the following detail on it as a minimum (removable adhesive sticker if possible):
        - Order number.
        - A short description of component.
        - The stock number.
        - Manufacturing date (refurbishment date if applicable)
        - Space for adding the installation date.

    • The documentation for preservation requirements should be delivered with the component.

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3.2 Refurbishment of Blowers.

The scope of this contract also includes the refurbishment of Blowers as follow:

1. The Contractor will be issued a "strip-and-quote" task order for Blowers requiring refurbishment or repairs.
2. For the purpose of refurbishments, the contractor is required to submit a detailed breakdown of all of the components of each Blower with the price for each component during tendering. See Appendix A. This should be done down to components level and not as kits or sets.
3. The contractor further also submits a list of repair activities that can typically be performed on each component and piece of equipment, See example table in Appendix A. This typically includes, but is not limited to things like:

    - Strip and assess.
    - Cleaning.
    - Sandblasting.
    - Machining of parts (bearing housings, rotors, etc).
    - Balancing of rotating parts.
    - Coating of rotating parts.

- Assembly.
- Adjustment of timing gear.
- Packaging.
- Etc.

4. The contractor further submits escalation formulas to be used for the different components or component groups and services. These component and repair activity escalation formulas will be used to verify that the escalated future refurbishment prices for components and activity are market related.
5. If there are components or services that the contractor would want to provide on a cost-plus mark-up basis, the contractor provides a list of these components. Proof of actual cost, for example invoices, then needs to be provided for these components and services at the time of invoicing.
6. To be able to determine a total estimated cost for refurbishments, the contractor supplies refurbishment costs as indicated in Table 2. The contractor calculates these costs from the cost breakdown in the table in Appendix A. Future refurbishment cost should be based on the cost quoted in Appendix A and escalation formulas in Appendix B, where applicable
7. The Contractor will be required to collect the Blower from Medupi Power Station for assessment and also for delivery after completion of works.
8. A quote as well as full assessment report (failure report) shall be submitted to the *Employer* (for attention to the Contacts Manager and System Engineers) within 10 working days after the issuing of task order for “strip-and-quote”.
9. The quote should contain a detailed cost breakdown of all spares and services required, including a breakdown of the lead time per item as well as total repair work.
10. The assessment / failure report should include proof (photos and measurement values obtained) of all components requiring replacement as well as any additional requirements to enable Blower restoration to original “as-new” specification/condition.
11. A draft QCP shall be submitted with the assessment report with hold and witness points specified, for review by the *Employer* prior to any repair work being conducted.
12. The assessment report should also include any findings and recommendations as to prevent re-occurrence with regards to the specific failure and or improvement of the lifespan of the Blower to be repaired.
13. Only after the quote, assessment report and QCP has been accepted by the *Employer*, will a task order be issued to proceed with repairs.
14. The *Employer* shall be given sufficient notice by the *Contractor* of any witness and hold points identified for adherence in the QCP. These points may be waived by the *Employer* from time to time depending on technical staff availability and request that photographic or other evidence to submitted electronically, for review and approval, before continuing with the manufacturing/assembly.
15. A Repair Data Book shall be compiled during the course of repair work for assessment by the *Employer* at any stage during the repair/manufacturing process.
16. The Repair Data Book shall contain as a minimum, but shall not be limited to, approved quality control plan, material certificates, profile grinding reports, backlash/end float inspection report, contact markings reports, vibration test report, as well as non-destructive testing reports.

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17. Only original OEM rotors, shafts and gears shall be used for repairs.

18. Hardcopies as well as electronic copies of the Blower manufacturing Data Book shall be supplied to the Employer with or before the delivery of the refurbished Blowers. This Data Book will be used during on site Quality Control checks to do final Quality acceptance of any Blower delivered. Refurbished Blowers delivered without this documentation will be rejected.
19. Where equipment or spares are obsolete or will become obsolete in the next 5 years, the *Contractor* is to indicate this to the *Employer* and also indicate viable alternatives.

3.3 Warranty

1. All Blowers shall carry a 24-month warrantee from date of delivery.
2. All Blowers shall carry a further 12-month warrantee after installation.
3. Any specific requirements to enable the 12-month warrantee shall be brought forward by the Contractor for agreement during negotiations. If witnessing of installation is required, this will be at the Contractor's own cost.
4. The warranty shall also cover, but not be limited to, minor defects identified, for example: shaft oil seal leakages, minor oil leaks and vibration after installation related issues, etc.
5. The contractor will bear all cost for warrantee repairs.

Table 1: List of spare Items and expected quantities.

Item no.	Short Description	Long Description	OEM	OEM Part No	SAP Material number	Unit	Quantity Installed	Exp. Quantity (New spares)	Delivery Time (weeks)	New Spare Cost (Excl. VAT)	Handling Fee %	Total cost per Item (Fee incl.)	Total Est Cost per Item
1	PJFFP Hopper Aeration Blower	Roots blower unit RAM-X 280 with 55 kW electric motor & force-ventilated acoustic enclosure	DRESSER (ROOTS)	SJ 7966	To be catalogued	EA	12	2					
2	Hopper Aeration Blower inlet Filter	TYPE: MCD-7; DIMENSIONS: 243ID X 344OD X 286 MM; MATERIAL: Paper; MICRON: 100; APPLICATION: Blower Inlet; EFFICIENCY: 99.9; SHAP: Cylindrical	Sowerby Engineering	model MCD-7	To be catalogued	EA	12	120					
3	Silo Aeration Blower	BLOWER: TYPE: 3 LOBE ROTARY RBS 46/F; CAPACITY: 723 M3/HR; SIZE: DN100; POTENTIAL: 400 V; CURRENT: 39.7 A; POWER: 22 KW; MANUF P/N: RBS 46/F; REFERENCE NO: 0 1-6 ETP20 AN002; 0 7-8ETP00 AN002; PROCESS MEDIUM AIR; MAX PRESSURE DELIVERY 700 MBAR(G); MAX TEMPERATURE 170 DEG C; SPEED 3552 RPM;MOTOR SPEED 2930; PULLEY DRIVE MUST BE COMPATIBABLE WITH A1550 V-BELTS; ROBOX SIZE 2 ENLOSURE; ROBOX EVOLOTION SIZE 46 BLOWER; BLOWER SIZE 1150 MM X 1155 MM X 1207 MM; NOISE ENCLOSURE MADE FROM GALVANIZED PLATE; ENCLOSURE VENTILATION FAN FLOW 1300 M3/H; SOUND PRESSURE LEVEL WITHOUT ENCLOSURE 85 DBA; ENCLOSURE FITTED WITH FILTER DP GAUGE AND DISCHARGE PRESSURE GAUGE; FOR USE ON SILO AERATION BLOWER; BLOWER PULLEY DIAMETER 132 MM; MOTOR PULLEY DIAMETER 160 MM; V BELTS SPA1550; NUMBER OF BELTS: 4; BOX VENTILATION FAN TYPE: CLU 250-2T01	ROBUSCHI / Letaba Pumps	Es46\2P-RVP80	662871	EA	8	4					

Item no.	Short Description	Long Description	OEM	OEM Part No	SAP Material number	Unit	Quantity Installed	Exp. Quantity (New spares)	Delivery Time (weeks)	New Spare Cost (Excl. VAT)	Handling Fee %	Total cost per Item (Fee incl.)	Total Est Cost per Item
4	Silo Aeration Blower Inlet Filter	FILTER, AIR: TYPE: SILO AERATION BLOWER INLET; DIMENSIONS: LG 790 X HT 278 X THK 19 MM; MATERIAL: CLOTH; MICRON: 5-10; MANUF P/N: 0.23.0791; 315528-1015; REFERENCE NO: 0 1-6 6ETP20 AT001; 07 8ETP00 AT001; ROBOX 2 - ES46/2/P-RVP80	ROBUSCHI / Letaba Pumps	filter for ES46/2/P - RVP80	663505	EA	8	80					
5	Silo Aeration Blower cooling Fan	FAN, ELECTRIC: TYPE: ASH SILO AERATION BLOWER; SIZE: OD 285 MM; POTENTIAL: 400-480 V; CURRENT: 0.30-0.34 A; VOLUME RATING: 400-2100 M3/HR; SPEED: 2761-3259 RPM; MATERIAL: ALUMINIUM; INSULATION CLASS: F; MANUF P/N: WCLU025NA11PNNA1; REFERENCE NO: LU 025-23-2T-C-00-P 44 CV; 2905396; 137-203W; IP44; CL.F; FAN WITH MOTOR	ROBUSCHI / Letaba Pumps	Cooling fan for ES46/2/P - RVP80	662864	EA	8	8					
											Total Estimated New Spare Cost:		

Table 2: List of Estimated Refurbishment Quantities and Activities

Item no.	Short Description	OEM	OEM Part No	Activity or components	Unit	Est Qty	Time (weeks)	Actual cost per item (excl. VAT)	Handling fee %	Total Cost per item (Fee Incl.)	Total Estimated cost
1.	**PJFFP Hopper Aeration Blower**	**DRESSER (ROOTS) / Sowerby Engineering**	**SJ 7966**		**EA**	**2**					
1.1.				Strip and quote	EA	2					
1.2.				Complete new OEM gear set	set	2					
1.3.				Complete new OEM Rotor set	set	2					
1.4.				Complete new seal set	set	2					
1.5.				Complete New Bearing set	set	2					
1.6.				Assemble and Test	EA	2					
1.7.				Collection and Delivery	EA	2					
										Total Estimated Refurbishment Costs	
2.	**Silo Aeration Blower**	**ROBUSCHI / Letaba Pumps**	**ES46/2/P - RVP80**		**EA**	**16**					
2.1.				Strip and quote	EA	16					
2.2.				Complete New OEM gear set	set	16					

Item no.	Short Description	OEM	OEM Part No	Activity or components	Unit	Est Qty	Time (weeks)	Actual cost per item (excl. VAT)	Handling fee %	Total Cost per item (Fee Incl.)	Total Estimated cost
2.3.				Complete new OEM Rotor set	set	16					
2.4.				Complete new seal set	set	16					
2.5.				Complete New Bearing set	set	16					
2.6.				Assemble and Test	EA	16					
2.7.				Collection and Delivery	EA	16					
Total Estimated Refurbishment Costs											
Total Estimated Refurbishment Costs – All Blowers											

Table 3: Miscellaneous Spares and Refurbishment.

Item no.	*Resource Description*	*Estimated % of total spares cost in Table 1 above*	**Handling Fee %**	*Total Estimate cost (excl. VAT)*
1	Miscellaneous spares not specified in Table 1	20% Based on pricing from Table 1		
			Estimated total unspecified spares cost	

4. Acceptance

This document has been seen and accepted by:

Name	**Designation**
Louis Snyman	Auxiliary Senior Engineer
Thapedi Ramokgoname	Officer Refurbishment
Peter Maheso	Acting Coal and Ash Mechanical Maintenance Manager

5. Revisions

Date	**Rev.**	**Compiler**	**Remarks**
June 2024	1	PG van Biljon	First revision

6. Development Team

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

Name	**Designation**
Louis Snyman	Senior Engineer
Johann Claassen	System Engineer

7. Acknowledgements

None

Appendix A: Prices for Refurbishment Components and Services

Blower (insert name 1) – Repeat and include table for each Blower.

Item no.	Component Description	Part No.	Qty	Component Price	Service 1	Price S1	Service 2	Price S2	Service 3	Price S3	Service 4	Price S4	Service 5	Price S5
A1.1	Blower Complete model XXX				Collect Blower	R x xxx.xx	Strip and Asses	R x xxx.xx	Re-assemble and Test	R x xxx.xx	Package Blower	R x xxx.xx	Delivery	R x xxx.xx
	Blower Housing pedestal assembly model xxxx			R x xxx.xx	Repair	Rx xxx xx								
A1.2	Rotatable Housing xxx		1	R x xxx.xx	Sandblasting	Rx xxx xx	Repair	Rx xxx xx	Internal Coating	Rx xxx xx				
A1.3	Inlet filter housing		1	R x xxx.xx										
A1.4	Rotor		1	R x xxx.xx	Sandblasting	Rx xxx xx	Rotor repair	Rx xxx xx	Coating	Rx xxx xx	Balancing	Rx xxx xx		
A1.5	Shaft		1	R x xxx.xx	xxxxx	Rx xxx xx								
A1.x	Bearings		2											
A1.x														
A1.n	Inspection Cover Socket head screw xxxx		4	R x xxx.xx										

Appendix B: Escalation Formulas for Components and Services

CPA 1:

Applicable to: Example Complete Blower, (List all applicable component of service using this formula)

Linked to Index	Proportion	Source
Material E8 (EN24 - Large range)	35%	SEIFSA
PPI - xxx	20%	SEIFSA
Labour C-3	20%	SEIFSA
Overheads D?	10	SEIFSA
Transport L-2(A)	5%	SEIFSA
Fixed	10%	SEIFSA
Total	100%	

CPA 2:

Applicable to: Example Bearings (List all applicable component of service using this formula)

Linked to Index	Proportion	Source
Material ?????	?????	SEIFSA
PPI - xxx	?????	SEIFSA
Labour C-3	?????	SEIFSA
Overheads	?????	SEIFSA
Transport L-2(A)	?????	SEIFSA
Fixed	?????	SEIFSA
Total	100%	

CPA n:

Applicable to: Components x or services y (List all applicable component of service using this formula)

Linked to Index	**Proportion**		**Source**
Material ?????	?????		SEIFSA
PPI - xxx	?????		SEIFSA
Labour C-3	?????		SEIFSA
Overheads	?????		SEIFSA
Transport L-2(A)	?????		SEIFSA
Fixed	?????		SEIFSA
Total	100%		