

	Specification	Medupi Power Station
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Title: **Medupi Power Station MPS265 Mill Major Overhaul Scope of Work** Document Identifier: **240-143499237**

Alternative Reference Number:

Area of Applicability: **Medupi Power Station**

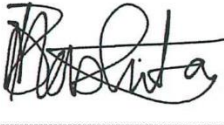



Functional Area: **Maintenance**

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1. Introduction

Medupi Power Station has a requirement of 30 mills to be refurbished on all units for a period of 36 months. This will improve the reliability of the milling plant and hence Medupi UCLF. This document describes the details 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 MPS265 Mill Major Overhaul Scope of Work activity requirements for Medupi Power Station.

The station is expected to perform at 92% UCF, 6% PCLF and 2% UCLF, and the specified Milling Plant Maintenance activities and Management strategy 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 set out in this document.

2.1.2 Applicability

This specification shall apply to all maintenance employees as well as contracting employees that are required to perform maintenance work and/or activities in support of the Medupi Maintenance Department on the Milling Plant at Medupi Power Station.

2.1.3 Effective date

The effective date of this document will be the date of authorisation.

2.2 Normative/Informative References

The following documents contain provisions that, through reference in the text, constitute requirements of this document. At the time of publication, the editions indicated were valid. These documents are subject to revision and users are responsible to ensure that the most recent editions of the documents listed below are used.

2.2.1 Normative

- [1] 240-97020108 v5.5: Medupi Power Station Maintenance Contract User Requirement Specification
- [2] 240-146751171 Medupi - Work Instruction - Vertical Spindle Mills Inspection Procedure
- [3] 240-123581452 Medupi Power Station Pulverized Fuel Sample Collection and Size Grading Work Instruction
- [4] 240-161447098 Medupi Power Station Mill Clean Air Curve Test Work instruction

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- [5] 241-2022446 Medupi Power Station Mill Raw Coal Feeder Maintenance Scope of Work
- [6] 237 - 0016 Rev 0: Integrated Business improvement – Prevention and Improvement Standard
- [7] 240-86851633: Foreign Material Exclusion
- [8] 32 - 726 Rev 0: Mandatory S.H.E. Requirements for the Eskom Procurement and Supply Chain Management Process
Note: See Annexure C: S.H.E. Requirements for Tender Enquiries
Annexure D: S.H.E. Tender Evaluation and Scoring Card
Annexure E: Supplier Suspension Process
- [9] 36 - 505 Rev 1: Personnel and Entities Performing Welding Related Special Processes on Eskom Plant
- [10] 36 - 942 Rev 0: Arc Flash Protection Specification
- [11] Act No 107 of 1998: National Environmental Management Act, 1998
- [12] Act No 14 of 2009: The National Environmental Laws Amendment Act, 2009
- [13] Act No 73 of 1989: The Environment Conservation Act, 1989
- [14] Act No 102 of 1980: National Key Points Act, 1980
- [15] Act No 36 of 1998: National Water Act, 1998
- [16] Act No 85 of 1993: Occupational Health and Safety Act & Regulations, 1993
- [17] GGR 0992: Plant Safety Regulations
- [18] 32-846 Rev 0 Operating Regulations for High Voltage Systems
- [19] NMP47-7 Rev 0: Application of KKS Plant Coding
- [20] 36 -702 Rev 1: Remnant Life Monitoring
- [21] BS EN15341 Maintenance Key Performance Indicators

2.2.2 Informative

- [22] 240-85498379 Medupi Power Station Milling Plant Maintenance Strategy

2.3 Definitions

2.3.1 Contractor:	Service provider contracted for supplying specific service to Eskom, Medupi Power Station.
2.3.2 Employer:	Eskom, or Eskom Medupi Power Station

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2.4 Abbreviations

Abbreviation	Explanation
BOM	Bill of Material
BS	British Standard
COC	Clean Out Conveyor
CT2	Contract Term 2
DIN	German Institute of Standards
ESO	Eskom Stakeholder Office
IR	Industrial relations
ISO	International Standards Organisation
KKS	Kraftwerk Kennzeichen System
NEC	New Engineering Contract
ORHVS	Operating Regulations for High Voltage Systems
P&T	Performance and Testing
PCLF	Planned Capability Loss Factor
PSR	Plant Safety Regulations
RCF	Raw Coal feeder
SANS	South African Bureau of Standards
SAP	Systems, Applications, Products (Plant Maintenance, Procurement, Finance and Materials Management) integrated maintenance management system.
SHE	Safety, Health and Environmental
SOW	Scope of Work
STEP	Station Thermal Efficiency Program
UCF	Unit Capability Factor
UCLF	Unplanned Capability Loss Factor

2.5 Roles and Responsibilities

Activity	Responsible	Accountable	Consult	Inform
Compilation	<ul style="list-style-type: none"> Senior Technician 	<ul style="list-style-type: none"> Mechanical Maintenance Manager 	<ul style="list-style-type: none"> Maintenance Manager 	<ul style="list-style-type: none"> All
Revision and Template update	<ul style="list-style-type: none"> Senior Technician System Engineer 	<ul style="list-style-type: none"> Mechanical Maintenance Manager 	<ul style="list-style-type: none"> Maintenance Manager Documentation Officer 	<ul style="list-style-type: none"> All

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Implementation	<ul style="list-style-type: none"> • Contractor • Technician • Senior Technician • Mechanical Maintenance Manager 	<ul style="list-style-type: none"> • Contractor • Technician • Senior Technician • Mech. Maintenance Manager 	<ul style="list-style-type: none"> • Maintenance Manager • System Engineer 	<ul style="list-style-type: none"> • All
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2.6 Process for Monitoring

In case of any additions, subtractions and/or amendments to the contents of the scope of work or any part of this document, prior the revision date, the Mechanical Maintenance Manager shall appoint a technician or senior technician to effect the necessary changes and to use the most current approved template for new revision.

2.7 Related/Supporting Documents

The following additional documents are attached and form an integral part of this scope of work. Copies of the relevant Employer performance standards can be made available on request.

- [1] B114103-35-99-GM03-00001 Technical Documentation Pulverizer Plant MPS® Mill

3. Scope of Work

3.1 Requirements

3.1.1 Contract Roles and Responsibilities

- a) The Contractor shall be required to perform major overhaul of one mill within a period of **25 Calendar Days.**
- b) The Employer is responsible for all Electrical, Performance and Testing, Commissioning as well as Control and Instrumentation Scope of Work as required.
- c) The Employer is responsible for Total Fluid Management, i.e., draining and re-filling of oil and any greasing requirement.
- d) The Employer and Contractor in this SOW is committed towards the following:
 - Retention of critical skills
 - Continuous cost reduction
 - Health & Environment Safety
 - Transfer of operational experience and skills

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- e) The Contractor is required to provide all Personal Protective Equipment necessary to complete the work.
- f) It is the responsibility of the Contractor to clean the mill internally before entry and commencement of the rebuild/overhaul.
- g) The Contractor shall compile improvement programmes to enhance plant performance and achieve cost reductions and the Employer will approve such programmes.
- h) The Contractor shall be responsible for all mechanical maintenance work as per Employer's instructions (refer to Appendix A.3), processes and systems, including work resulting from inspections and tests within the applicable plant areas.
- i) The Contractor shall be responsible for mill commissioning after handover and shall provide both mechanical and C&I resources for commissioning of the mill.
- j) Handover of the mill shall be deemed completed after the mill has been successfully commissioned and has been running stable for 7 days (168 hrs) after commissioning. There shall be no mill trip during this proving period of 168hrs. PF sampling shall be undertaken by the Employer after 72hrs of running, it is expected that the results should be within specification (240-123581452)
- k) The Contractor is responsible to oversee clean air curve test conducted by the Employer. P&T is done by the Employer according to 3.1.1(b) (240-161447098).
- l) The Contractor shall be responsible for all equipment requirements within this scope of work as per protocols.
- m) The Contractor shall make use of local black economic empowerment through the use of black business. The Contractor during the duration of the contract shall train persons from the local community in relation to the works; such proof shall be given to the Employer for verification and acceptance.
- n) 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., safety, time management and workmanship).
- o) The following complementary services to improve Plant and labour performance can be defined as follows:
- Project Management
 - Value engineering
 - Commercial Management
 - Technical advice

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- IR Management
 - Operational and production process review
- p) 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.
- q) 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.
- r) 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.
- s) All works and safety documentation will be subject to anytime inspection from the Employer.
- t) 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.
- u) The Contractor will only mobilize a crew per mill scheduled for refurbishment upon receipt of a Task Order from the Employer, which will be supervised by the Contractor. This contract is for the overhaul of 30 mills over 36 months.
- v) Spillage is viewed to be very important for plant housekeeping as well as Environmental Management. Any spillage caused as a result of the Contractor's activities during the rebuild shall be contained and cleaned by the Contractor.
- w) Housekeeping shall be maintained throughout. Upon handover, the Contractor shall take responsibility to conduct effective housekeeping all-round the mill to render the mill in clean, safe and serviceable condition.
- x) The Contractor shall ensure the integrity of plant labelling and ensure KKS labelling is not damaged during the execution of the work and if needed to be removed it will be reinstated in its original position or any position determined by the employer.
- y) The Contractor must ensure that they have responsible persons (RP) (in terms of PSR) for any work performed on plant. This requires individuals to successfully complete a written and oral examination based on the Plant Safety Regulations.
- z) All mechanical fitters and supervisors (above semi-skilled) to be trained and authorised (in terms of PSR and ORHVS) within 3 months of the contract award date. Training will be supplied by the Employer.

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- aa) The Contractor must ensure that all personnel successfully complete a written examination for the relevant regulation based on the Fossil Fuel Firing Regulations (FFFR). Training will be provided by the Employer.
 - bb) Before any work starts on site the Contractor is responsible to submit their Safety File to the Employer for review and acceptance.
 - cc) The Contractor is also responsible for their employees' annual medical checks which must be up to date and also kept in the Safety File. Site Induction must be done before any work is done by any Contractor on site.
 - dd) The Contractor shall be expected to mobilize its crew/s within 2 weeks of receiving the Task Order/s.
 - ee) The Contractor shall present a monthly dashboard on maintenance key performance indicators according to BS EN15341, which will be discussed and agreed with the Employer prior to commencement of the contract.
 - ff) The Contractor shall ensure that he has all the necessary hand tools (including pneumatic), welding machines, welding consumables and other consumables as well as lifting equipment (including a pick and carry crane, 50 ton or above) required to complete the job. **Note:** All other special tools will be supplied by the Employer.
- **Note:** All lifting equipment supplied by the Contractor must have the appropriate certification which is valid for the duration of the overhaul. Copies of all documentation will be kept available at the mill where the Contractor is busy performing the work and in the contractor's office for review by the Employer at any time.
 - **The Contractor shall supply all the spares agreed upon during negotiations that will be required by the Employer as per the attached list, Appendix A.2**

3.1.2 Continuous Improvement

- The Contractor shall implement a program of continuous improvement to optimise plant performance and reduce system and equipment failures.
- The Contractor shall participate in improvement programs as stipulated by the employer.

3.1.3 Management and Reporting

- The Contractor to be represented at all Employer's monthly contract and safety meetings.
- The Contractor to be represented at any ad-hoc meetings that may arise in order to address any production or safety related matters.

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- Liaison meetings shall be held with the Employer's Representative or his/her delegate on a weekly basis to discuss progress any technical details, or concerns.

3.1.4 Quality and Documentation Control

- a) The Contractor shall ensure that any witness, hold and inspection points are strictly adhered to.
- b) The Contractor to ensure that all measuring and test equipment are 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 standards (including 32-6 Rev 5) and processes.

3.1.5 Project Implementation

- a) The Contractor shall supply a project implementation plan including at least the following:
 - i. Site establishment
 - ii. Manpower plan
 - iii. Organogram
 - iv. Skills required and associated cost per skill (e.g. artisan, site manager, etc.).

3.1.6 Manpower Requirements

- a) The successful Contractor shall utilise/provide skilled and suitably qualified staff with current experience in the following but not limited disciplines.
 - i. Working knowledge of SAP R/3 system
 - ii. Occupational Health and Safety Act 85 of 1993
 - iii. NEC contract management
 - iv. Quality Management Control and Assurance procedures
 - v. Plant Safety regulation authorisation
 - vi. Spares optimisation
 - vii. Procedure writing
 - viii. BOM compilation
- b) The Contractor shall make use of local black economic empowerment through the use of black business and recruitment of locals. Specialized skills that are not available locally maybe sourced non-locally after providing evidence of non-availability of the specialized skills. The

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Eskom Stakeholder Office (ESO) will give guidance on the recruitment process to be followed.

The Contractor is requested to liaise with the Contract Manager for contact details of the ESO.

- c) All staff brought onto site in connection with this work scope should be able to fluently speak, understand and write in English.
- d) Employer's Site Entry and Security Controls, permits, and site regulations (Police Clearance)
All Contractor personnel are to undertake Police Clearance. Certificates must be provided to the Site Service Manager. The Site Service Manager reserves the right to refuse entry to all persons whose criminal records indicate that their presence on site might create an unsafe and insecure environment to specific Power Station. The process shall be repeated every 12 months for low-risk employees (Risk Rating 5, 4) and every 6 months for medium to high-risk employees (Risk Rating 3). The following website can be used to guide the process.
http://www.saps.gov.za/service/applying_clearance_certificate.php
- e) The Contract shall provide proof of verification of all its Employees qualifications 30 days after contract award.
- f) The Contractor ensures that all staff being brought onto Medupi site has a valid fitness certificate based on the specified plant man-job specification.
- g) The Contractor shall employ in and about the execution of the works only such persons that are careful, competent and efficient in their specific trades and callings and the Employer shall be at liberty to object to and require the Contractor to remove from the works forthwith any person employed by the Contractor in or about the execution of the works who, in the opinion of the Employer, misconducts himself or is incompetent or negligent in the proper performance of his/her duties and such person shall not again be employed for the works without the written permission of the Employer.
- h) Provide daily supervision of all related plant through trained and competent personnel to ensure that inspections & work activities are conducted daily.
- i) Ensures proper behaviour of personnel under his/her supervision.
- j) The Contractor must ensure that monthly IR meetings are conducted with his/her IR Manager and Employees on site.
- k) Ensures training of all personnel under his/her supervision. The training required will include but not limited to Eskom safety training requirements, related plant training if deemed necessary.
- l) Ensures high morale of staff and competency.

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3.1.7 Re-commissioning

- a) All Plant equipment maintained shall be re-qualified as per site specific procedure (237-0081) after any maintenance intervention.
- b) The Contractor shall be responsible or held liable for any defects arising from maintenance/operational faults over a period of 7 days (168 hrs) after a major overhaul of the equipment the Contractor worked on.

3.1.8 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;
 - Forklifts
 - Mobile cranes
 - Cherry Pickers
 - 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. Confine space locations
 - ii. Working at heights
 - iii. Heat stress areas
 - iv. Scaffolding
 - v. Hazardous substances

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3.2 Plants Area

3.2.1 Milling Plant

The contractor shall execute the scope of work as outlined below and according to instructions in Appendix A3.1 and Appendix A3.2.

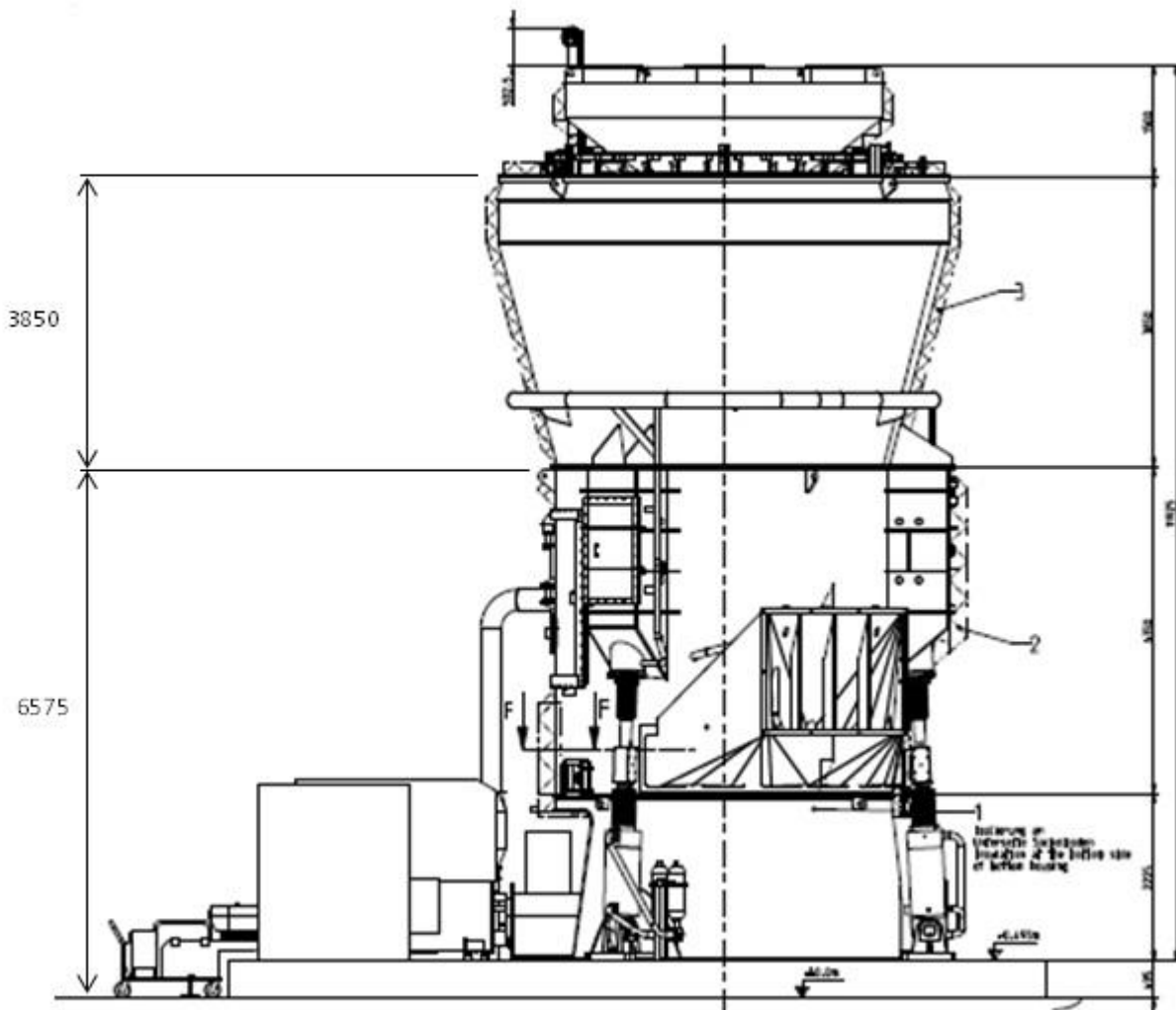
3.2.1.1 Applicable Plant Area

Plant Area	Boundaries of Plant Area
<p>Milling Plant</p>	<p>The Milling Plant is defined as the plant and equipment interfacing with coal, that exists between the following points:</p> <ul style="list-style-type: none"> - the coal bunker (excluding bunker inlet chute), and - outlet of the mill classifier. <p>This scope of work is applicable to the following equipment, within the milling plant boundaries:</p> <p>Mill (Vertical Spindle)</p> <p>The plant and equipment interfacing with coal, that exists between the following points:</p> <ul style="list-style-type: none"> - raw coal inlet chute to the mill, and - outlet of the classifier including isolating gate valves <p>This implies the following plant and equipment:</p> <ul style="list-style-type: none"> - gearbox - mill reject box - mill body/housing - nozzle ring (including displacer ring) - pyrite space (scraper compartment) - grinding elements (i.e., track & rollers) - loading frame and tension rods - static classifier - hydraulic system, excluding lubrication activities - mill air supply inlet (including control & isolating dampers, rotating throat) - raw coal feeder - seal air fan

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3.2.1.2 Applicable S.O.W

a) GEARBOX

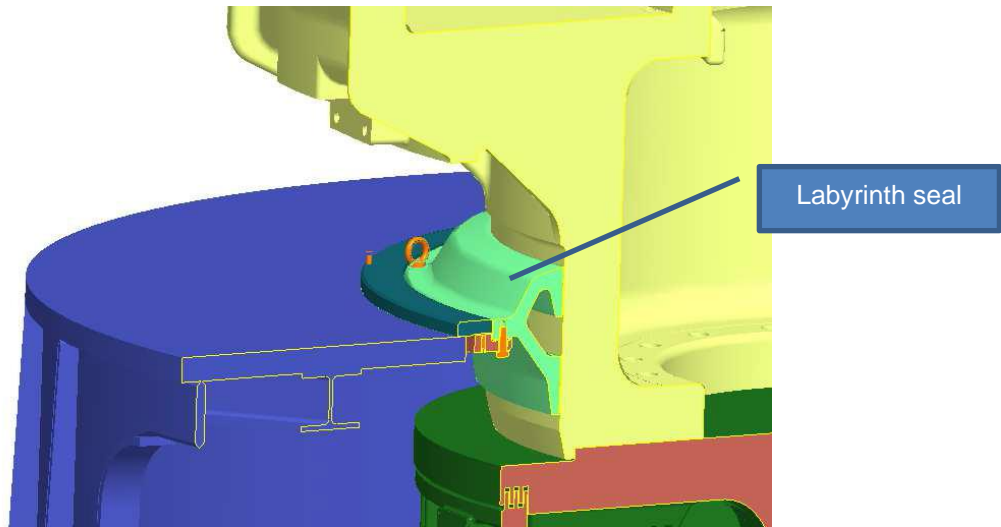
(Planetary bevel wheel gear unit KPV 1750S, 31 900kg; labyrinth seal, 1 126kg)

- Measure clearance at the tilting pad bearing
- Visual checks for the white metal layer condition
- Measure gap between labyrinth seal and shaft
- Inspect and replace the gearbox coupling and
- Inspect main motor for alignment and realign if required

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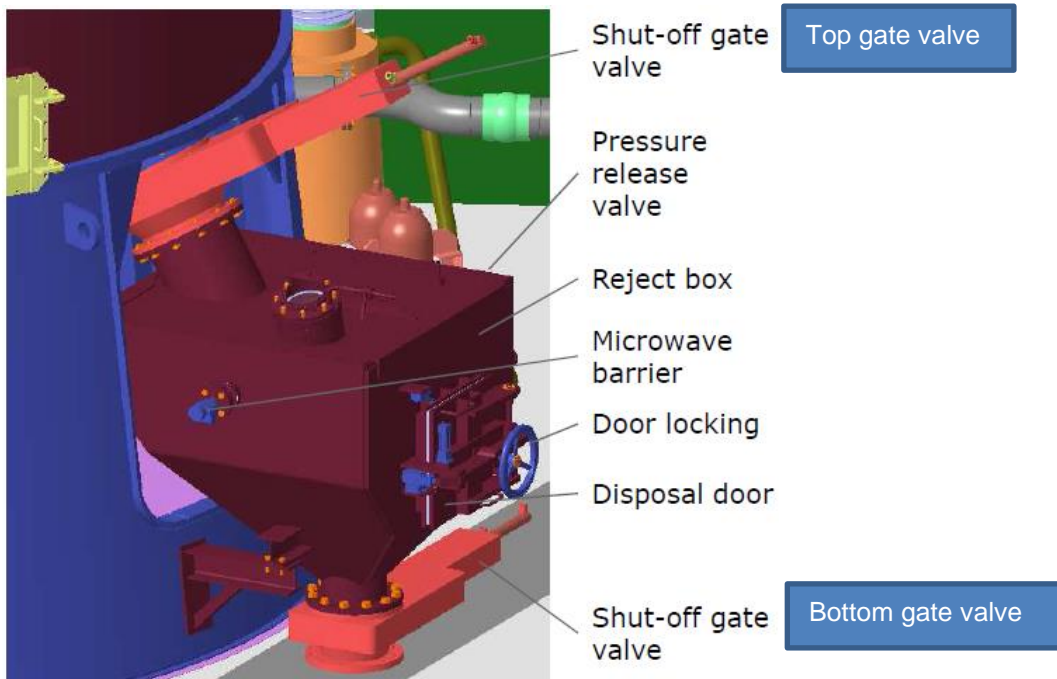
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b) MILL REJECT

- Refurbishment of reject box top gate valve (Gate valve, GAS DN 350 PN 06 hydraulic)
- Refurbishment of reject box bottom gate valve (Gate valve, GAS DN 250 PN 16, hydraulic)
- Refurbish mill reject T piece
- Inspect the reject box and install new gaskets/seal on the door
- Inspect and replace the reject box grating if necessary.



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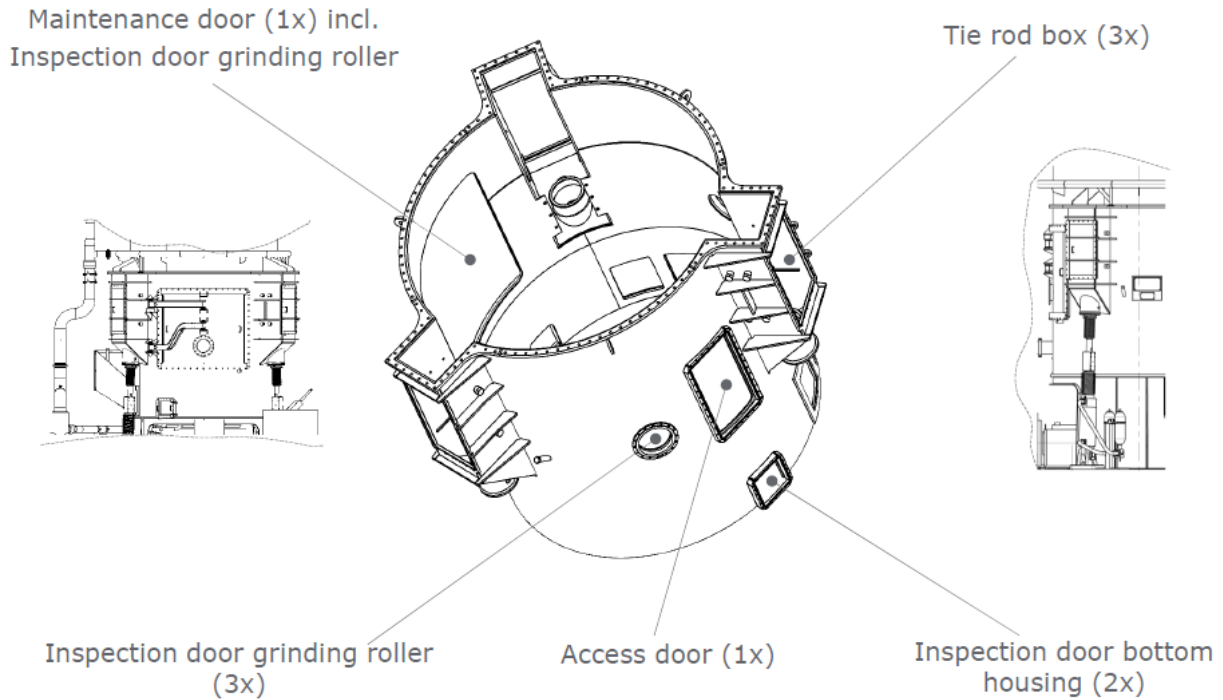
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c) MILL HOUSING

(30mm 16Mo3 base plates, wear protection plates with chromium carbides welded overlay)

- Measure wall thickness on wear plates (mill housing, maintenance door, access door, 3 grinding roller inspection doors, 2 bottom housing inspection doors, 3 tie rod boxes)
- Repair worn out areas (<2mm housing, <5mm yoke)
- Replace worn or damaged door seals



d) NOZZLE RING

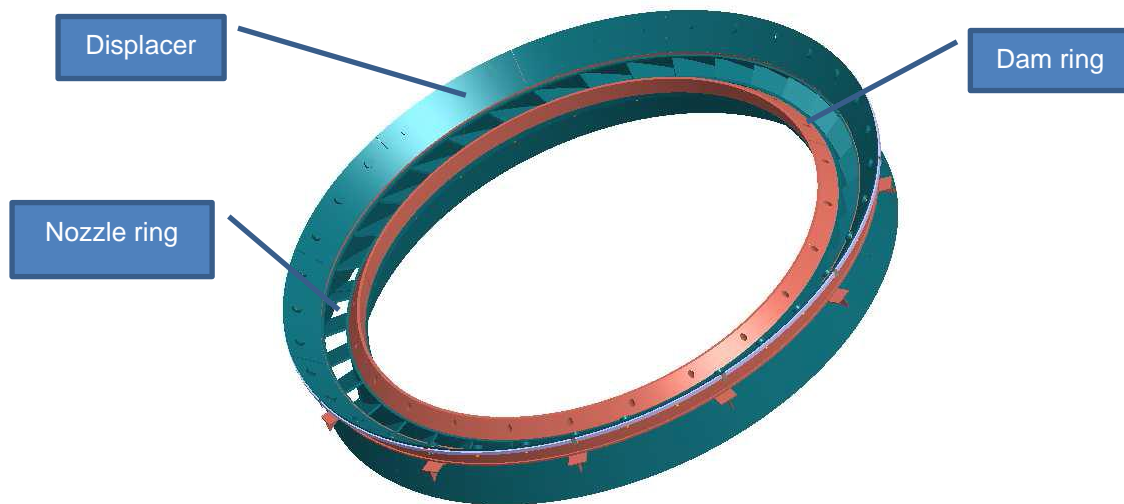
(12 rotating nozzle ring segments, 3 322kg; 12 cover ring segments, 786,9kg; 12 displacer cone segments, 345,3kg)

- Remove worn out nozzle ring segments
- Install new nozzle ring segments
- Remove worn out cover ring (dam ring) segments
- Install new cover ring (dam ring) segments
- Remove worn out displacer cone segments
- Install new displacer cone segments
- Replace worn out wear protection caps
- Replace sealing cord square between the displacer ring and mill housing
- Measure clearance between displacer and rotating nozzle ring (horizontal)

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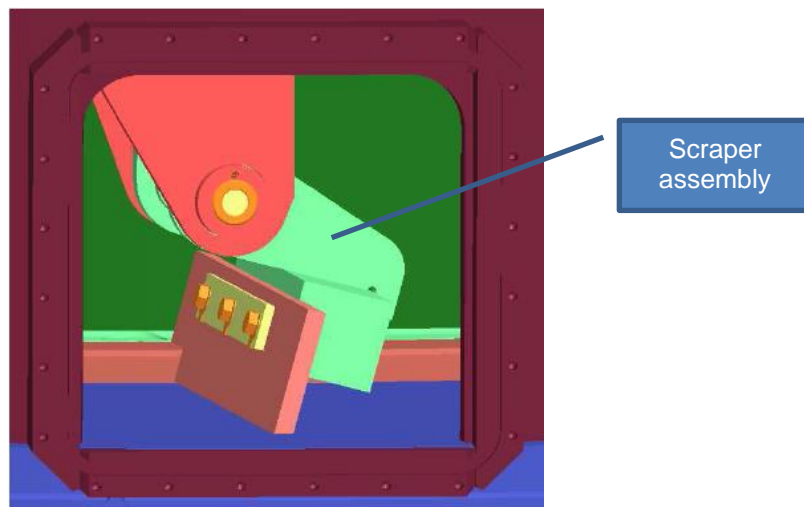
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e) PYRITE SPACE (Scraper Compartment)

(2 scraper assemblies, 227kg)

- Replace damaged scrapers, including barrel liners if found to be defective
- Measure clearance between scraper and bottom housing plate



f) GRINDING TRACK

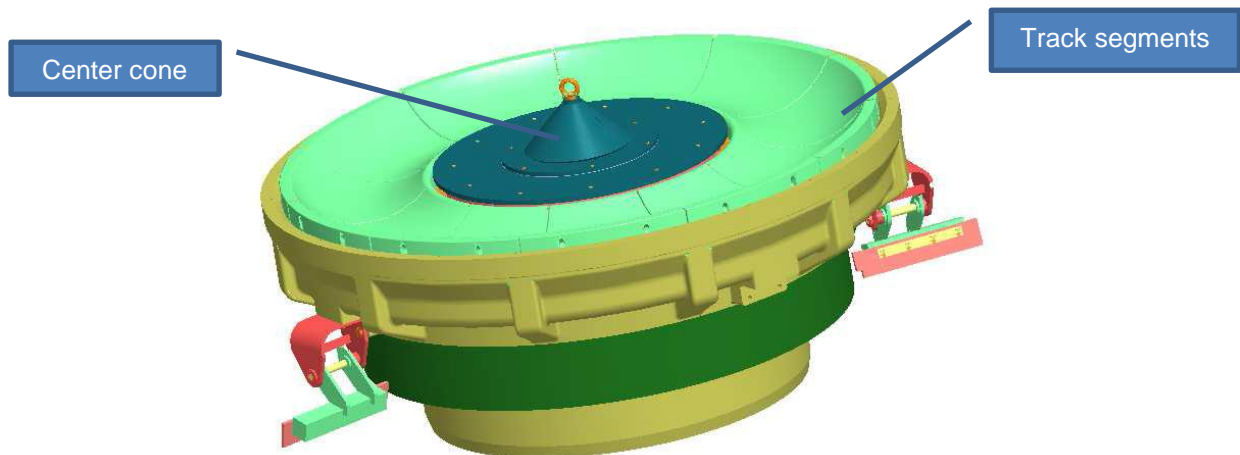
(13 grinding track segments EN-GJN-HV600, 9 243kg)

- Remove center cone
- Remove worn out grinding track segments
- Install new grinding track segments
- Replace center cone and new bolts

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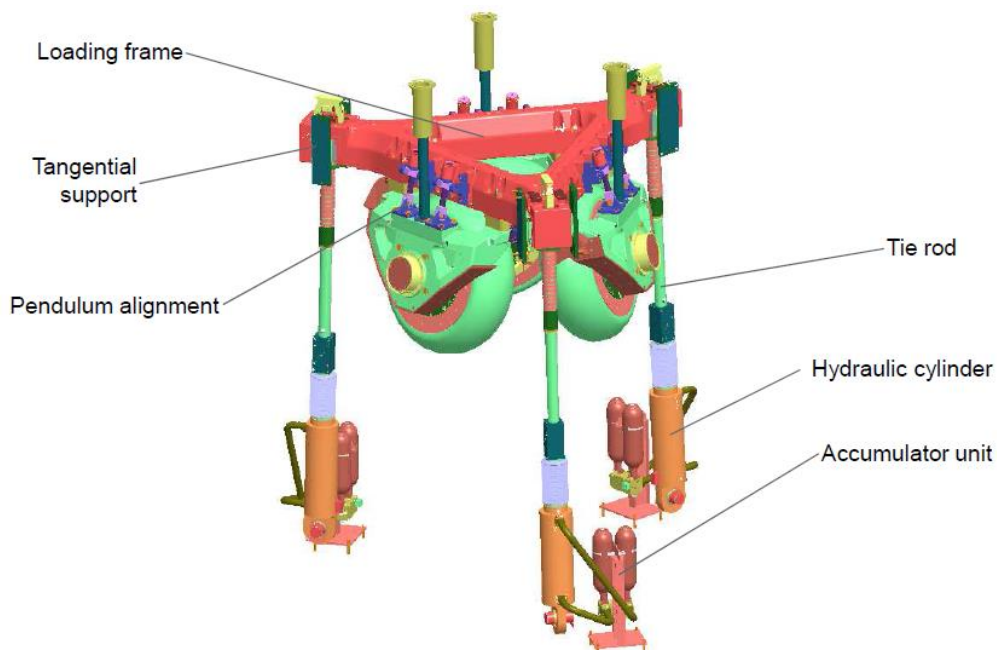
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g) GRINDING ROLLERS

(3 grinding roller assemblies, 49 497kg)

- i. Drain grinding roller oil
- ii. Remove worn out grinding roller assemblies
- iii. Install new grinding roller assemblies
- iv. Fill new grinding roller oil
- v. Inspect for wear and movement within the link joint of the sealing air supply to the three grinding rollers
- vi. Inspect and refurbish seal air fan and seal air fan lines
- vii. Check the clearance between the guide bearing and tilting bearing of the sealing air supply to the three grinding rollers
- viii. Inspect for wear on the pendulum alignment and replace if required
- ix. Inspect for wear-on-wear protection covers and replace if necessary



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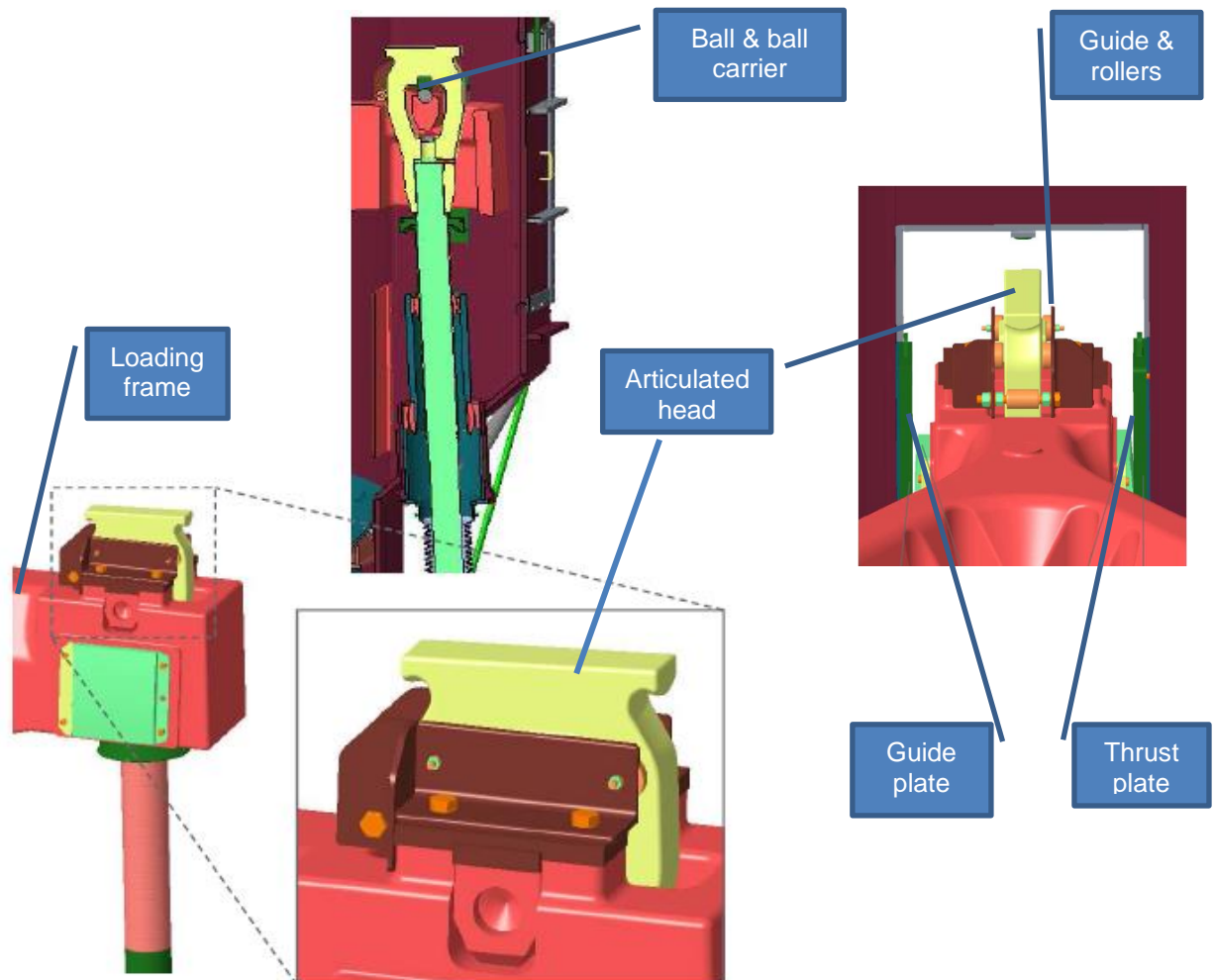
h) HYDRAULIC SYSTEM (excluding lubrication activities)

- Inspect Hydraulic Cylinders and replace if any oil leaks are identified.
- Uncouple the hydraulic cylinders, stroke and calibrate if required from the results of stroking and replace cylinder if out of calibration range.

i) LOADING FRAME AND TIE ROD SYSTEM

(3 thrust plates; 3 guide plates; 3 ball and ball carriers; 3 tie rods, 1 011kg)

- Inspect for wear and mechanical damage on the tie rod, loading frame wear protection, articulated head, including ball and ball carrier and replace if necessary
- Check the contact, fit and wear of the thrust plates at the loading frame and mill housing
- Check the play, fit and wear of the guide plates at the loading frame and mill housing
- Replace the thrust and guide plates if there is a residual wall thickness of 50%
- Replace loading frame wear protection if there is a residual wall thickness of 50%



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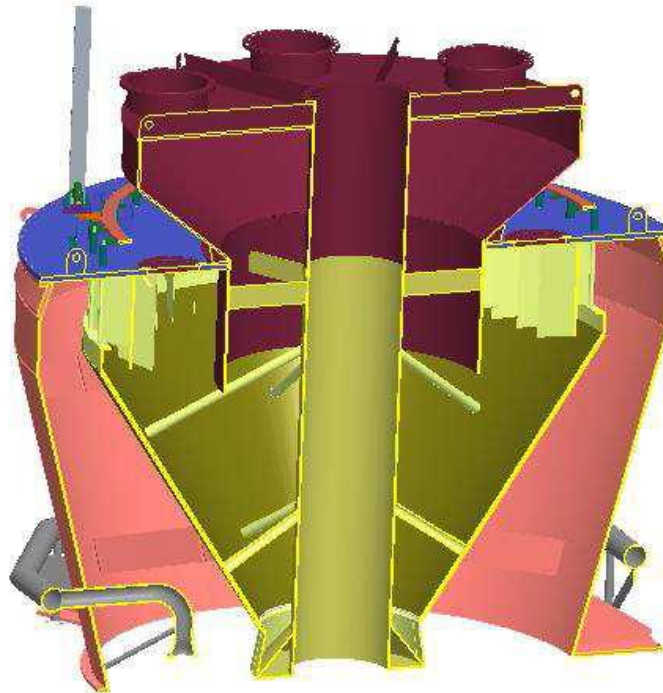
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j) CLASSIFIER

(SLK470 – Static Classifier with 36 vanes and 6 PF pipe outlets, 38 434kg)

- Inspect for wear on the classifier housing, vanes, stiffeners, guide plates and oversize return hopper cone
- Inspect for wear on coal gravity duct, including square to round feeder discharge piece (replace new if residual thickness is found to be less than 50%)



k) RAW COAL FEEDER (RCF)

- Open the RCF
- Clean feeder internally
- Conduct inspection and repairs on the RCF according to SOW in Annexure A3.1
- Replace any worn out, damaged, ceased components as per results of inspections
- Request station lubrication contract to perform any required lubrications
- Inspect the feeder outlet gate, replace the gaskets and stroke check the actuator
- Inspect and replace bolts and gaskets on feeder doors
- Inspect the square to round pipe and replace if worn out.
- Inspect the bunker isolation gate repair if necessary
- Request assistance from Eskom for any defect requiring Electrical and C&I attention.

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I) SEAL AIR FAN

- Inspect seal air fan impeller and replace when damaged
- Inspect bearing block and coupling. Replace if necessary

3.2.1.3 Spares and Consumables

Refer to Appendix A.2 for spares requirements.

3.2.1.4 Special Tools

Refer to Appendix A.1 for special tools requirements.

3.3 Communication and Correspondence

a) All correspondence includes:

- i. Medupi 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 are decided upon at the Inaugural meeting.

3.4 Tender Requirements

A proposal is to be submitted by the tenderers for the above-mentioned scope of work.

- Hereafter a contract shall be negotiated with the successful Contractor.
- The appointment of successful Contractor is at Eskom's (The Employer) sole discretion considering the factors which Eskom deems relevant.

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4. Acceptance

This document has been seen and accepted by:

Name	Designation
Kenneth Ndumo	Engineer Prof Mechanical
Siya Kuzwayo	Engineer Prof Mechanical
Bernard Matanda	Senior Advisor Engineering
Sithokozile Hlongwa	Manager Boiler Engineering

5. Revisions

Date	Rev.	Compiler	Remarks
Feb 2024	4	PM Mashita	Third Revision
May 2023	3	PM Mashita	Second Revision
April 2020	2	PM Mashita	First Revision
January 2019	1	MB Matanda	First Issue

6. Development Team

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

- Phuti Mashita
- Elton Lemboe
- Bernard Matanda
- Kenneth Ndumo

7. Acknowledgements

None

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Appendix A – Additional Information

A.1 Tools and devices

To be supplied by the Employer

Serial Number	Description	Drawing Reference
1	Lever for tie rod bolt Level - 1x per unit	B114103-35-43-IG04-00121-
2	Erection sleeve for tie rod bolt Sleeve- 1x per unit	B114103-35-43-IG04-00122-
3	Erection hold for anchor bolts Erection hold 2- 1x per unit	B114103-35-43-IG04-00124-
4	Centring pin for grinding track carrier Centring pin - 3x per unit	B114103-35-43-IG04-00125-
5	Oil measuring stick inflexible Oil measuring stick - 1x per unit	B114103-35-41-IG04-00001-
6	Lifting & dismantling device for grinding segments comp. lifting & dismantling device - 1x per unit Dismantling grinding segments, assembly consisting of: -Beam IPE - 1x -Hexagon head bolt/disc M24-4x -Complete tum buckle - 1x -Bushing- 1x -Spur gear hoist - 1x	B114103-35-43-IG04-00071- B114103-35-43-IG04-00154-
7	Alignment bolt gearing Alignment bolt - 4x per unit	B114103-35-43-IG04-00126-
8	Alignment rods for grinding roller Alignment rods - 3x per unit	B114103-35-43-IG04-00077-
9	Lifting device for grinding roller Complete lifting device for grinding roller - 1x per unit	B114103-35-43-IG04-00086-
10	Lifting device for roller tyre Complete lifting device - 1x per unit	B114103-35-43-IG04-00079-
11	Mounting device for grinding roller (tum buckles) Complete tum buckles/supports – 6x per unit (2 x per grinding roller)	B114103-35-43-IG04-00093-
12	Dismantling grinding roller, Pulling of yoke Dismantling grinding roller, Pulling of clamping ring Dismantling grinding roller, Removal of axle Dismantling grinding roller,	B114103-35-43-IG04-00131- B114103-35-43-1G04-00132- B114103-35-43-IG04-00133- B114103-35-43-IG04-00134-

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Serial Number	Description	Drawing Reference
	<p>Removal of roller bearing Dismantling grinding roller, Removal of cylinder bearing Dismantling grinding roller, Removal bearing internal ring</p> <p>Complete dismantling device - 1x per unit, consisting of: -Dismounting plate - 1x -Lifting eye bolt-3x Threaded rod M56-4x -Hexagon nut/washer M56-8x -Threaded rod M36x540-3x -Hexagon nut/washer M36-6x -Threaded rod M36x1300-3x -Hexagon nut/washer M36-9x -Threaded rod M48-3x -Hexagon nut/washer M48-6x -Hydraulic cylinder - 4x Hand pump-4x -Hydraulic hose-4x -Quick-connect socket - 4x -Hexagon nut/washer M10 - 4x Forcing ring - 1x -Intermediate piece - 1x -Complete removal device cylinder roller bearing - 1x -Intermediate plate - 1x -Dismounting ring - 1x</p>	<p>B114103-35-43-IG04-00135- B114103-35-43-IG04-00136-</p>
13	<p>Gear dismounting device Gear dismounting device - 4x consisting of: -Support-4x -Shim plate 110 and t5 - each 4x -Shim plate 12, 11 and t0.5-each 8x -Adapter piece - 4x -Hydraulic cylinder with accessories - see no.12</p> <p>Gear unit disassembly plan consisting of: -Bracket-2x -Hexagon head bolt/nut M20-4x -Roller skates-4x Hexagon head bolt M12 - 16x Hydraulic cylinder with accessories- see no.12</p>	<p>B114103-35-43-IG04-00148- B114103-35-43-IG04-00160- B114103-35-43-IG04-00158-</p>
14	<p>Hydraulic swing-out device grinding roller Complete device - 1x per unit</p>	<p>B114103-35-43-ID04-00021-</p>
15	<p>Support hydraulic cylinder/coupling piece Complete support-3x</p>	<p>B114103-35-43-IG04-00159-</p>

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Serial Number	Description	Drawing Reference
16	N2 filling- and test device - 1x per unit	
17	Wear templates, measurement report	B114103-35-41-IG04-00011-
	Measurement report - 1x per unit	
	Wear template, grinding segment	B114103-35-41-IG04-00012-
	Wear template, grinding segment - 1x per unit	
17	Wear template, grinding roller	B114103-35-41-IG04-00013-
	Wear template, grinding roller - 1x per unit	
18	Tool for grooved nut tie rod Complete tool - 1x per unit	B114103-35-43-IG04-00162-
19	19. Tool for grinding roller adjustment Complete tool - 1x per unit	B114103-35-43-IG04-00115-

Not supplied by the Employer

- ❖ Mobile crane
- ❖ Low bed truck

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A.2 Spares and Consumables

SCOPE	Item no	QTY per Mill	DESCRIPTION OF SPARES REQUIRED	Total QTY (30 Mills)
MILL FEEDER SPARES				
Refurbish Raw Coal Feeder		2	COC Take-up spindle/shaft	40
		2	Take-up tensioning rod nut	80
		2	Coal feeder Back-up Ring, 150mm Dia X 50mm	80
		2	Coal feeder Seal Ring, 180mm Dia X 15mm	80
		2	Labyrinth seal, 180mm dia X 16mm -drive shaft (Radial seal)	80
		5	RCF Roller table idlers, MI 63.5, SW 15, RL 500 - completed set	100
		2	RCF Bed depth limiter bar	80
		1	RCF Bed depth limiter spindle	40
		1	Coal detector flap	10
		2	Coal detector flap bearing	20
		1	Inspection doors seals - Rubber gasket 5 mm	40
		1	COC Scraper chain, Axle base 4225mm; conveyor chain 10x 38mm; chain pitch 146,8mm	40
		46	RCF idlers - Ramsey 10-20-1, single idler	460
		12	Coal bunker shut off valve High pressure packing, 20 X 15 RivaMid K83	480
		1	Compensator; MTRL: Rubber EPDM; 13mm thick; 500C; 3.5 bar; 40mm axial compression; 20mm axial extension; 10mm lateral movement	15

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SCOPE	Item no	QTY per Mill	DESCRIPTION OF SPARES REQUIRED	Total QTY (30 Mills)
		1	RCF Drive pulley	10
		1	COC Non drive shaft - EN19 Steel, Take up rod - Clean-out shaft	20
		1	RCF outlet gate - Shut-off gate valve, HPE, Type AS 800 x 1000	20
		1	Coal bunker shut off gate spindle -, Round steel, 60mm dia, C45	40
		1	Coal bunker shut off gate spindle -, Round steel, 80mm dia, C45	40
		1	Bottom RCF outlet gate bearing - Two-hole flange bearing, Type PCJT 30-N, EN-GJL	40
		2	Coal Feeder Cleanout Conveyor Take Up Disc Spring; TYPE: SPRING; DIMENSIONS: ID 28.5 X OD 56 X THK 2 MM; MATERIAL: CHROM VANDADIUM; DIN 2093; FOR USE ON MILLS; PART NO: SF-TAP	40
		2	Clean out shaft Take up bearing; INSIDE DIAMETER: 50 MM; HOUSING SIZE: WD 115 X LG 148 MM; SLOT WIDTH: 16 MM; FRAME: WD 16 X LG 400 X HT 102 MM; ROLLING ELEMENT: BALL; HOUSING MATERIAL: CAST IRON; STYLE: ECCENTRIC LOCKING COLLAR; PART NO: TTUE50	40
		2	Clean-out shaft bearing sea ring; TYPE: NEEDLE; INSIDE DIAMETER: 50 MM; OUTSIDE DIAMETER: 60 MM; WIDTH: 25 MM; MATERIAL: CARBON CHROMIUM STL; BORE SHAPE: CIRCULAR; DIN 620; IR SERIES; PART NO: IR50X60X25	40
		2	SEAL, RING, TYPE: RADIAL SHAFT; INSIDE DIAMETER: 60 MM; OUTSIDE DIAMETER: 80 MM; THICKNESS: 7.7 MM; MATERIAL: NBR; APPLICATION: MILLS; RUBBER NBR 80 SHORE A; CASE SAE 1008; SPRING SAE 1070; RADIAL SHAFT SEAL WITH RUBBER COVERED O.D SHORT; FLEXIBLY SUSPENDEED; SPRING LOCATED SEALING LIP AND ADDITIONAL DUST LIP; PUMP SEAL TYPE N; PART NO: TCN11	40
SEAL AIR FAN REPAIRS				
Repair Seal Air fan		1	Fan Impeller, RADIAL CENTRIFUGAL FAN A HRZ10/224/975/5 FOR MILL SEAL AIR SYSTEM	15

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SCOPE	Item no	QTY per Mill	DESCRIPTION OF SPARES REQUIRED	Total QTY (30 Mills)
		1	Coupling, Flender, Flexible N-Eupex, Type B 140	20
		1	Block Bearing Seal air fan - A-HRZ10C/224/950/5; DRAWING NO: 71079A1-BLK60NS	20
MILL HOUSING REPAIRS (Liners)				
Rebuild side wall liners		4	Liner plate, 2900 (±100) x 1800 (±50) x 12 mm (W x L x t), Material: 8mm Composite wear plate, hard-faced with 4mm HRC62 on inside diameter, rolled to 2200 mm (±100mm) ID	40
Rebuild main inspection door		48	M16 x 40 Hex Head, Mat 8.8, galvanised	1920
		1	Sealing Cord Square 15 x 15 x 3800 mm, Ceramic Fibre with Inconel Core 500°C	40
		38	Locking Edge Washer VSK 16, Galvanized, Mat: Spring Steel EN 10204 2.2	1520
Rebuild inspection door		64	M24 x 75 Hex Head Bolt, Mat 8.8, galvanised	2560
		1	Sealing Cord Square 15 x 15 x 9600 mm, Ceramic Fibre with Inconel Core 500°C	40
		64	Locking Edge Washer VSK 24, Galvanized, Mat: Spring Steel EN 10204 2.2	2560
Rebuild Roller Access door		48	M20 Hex Nuts, Mat 8, galvanised	1920
		48	M20 x 70 Hex Head Bolt, Mat 8.8 galvanised	1920
		48	Locking Edge Washer VSK 20, Galvanized, Mat: Spring Steel EN 10204 2.2	1920
		3	Sealing form IBCDN400, PM6 PN6, 2mm thick, Mat: Synthetic	120
Replace Scraper Compartment Door		48	M12 x 35 Hex Head Screw, Mat:8.8 galvanised	1920
		48	Locking Edge Washer VSK 12, Galvanized, Mat: Spring Steel EN 10204 2.2	1920
		2	Sealing Cord Square 15 x 15 x 1800 mm, Ceramic Fibre with Inconel Core 500°C	80

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SCOPE	Item no	QTY per Mill	DESCRIPTION OF SPARES REQUIRED	Total QTY (30 Mills)
		2	Scraper bolts& washers set M30 x 70	80
GRINDING TRACK SPARES				
Install track segments (213)	1	26	Spring Plate Clamping Screw D54 / 30,5 X 30, Mat: 1.0503 (C45)	1040
	11	26	Clamping Screw M30 X 392 /317, Galvanized, Mat: 1.0060 (including arrangements)	1040
	21	104	Disk Spring 80 x 41 x 3, Galvanized, Mat: 1.8159 (51CrV4) Chromium-Vanadium Steel Washer - Disc Spring Washer	4160
	31	52	Support Ring SU 30 - 35 - 1.4, Mat: T	2080
	41	26	O Ring 30 x 3, Mat: Viton	1040
	51	26	M30 Hex Nut, Galvanized, Mat: 5	1040
	52	26	M30 Hex Nut, Galvanized, Mat: 8	1040
Install clamping ring bolts + torque (191)	31	13	Hex Socket Head Cap Screw M30 X 380, Galvanized, Mat: 8.8	520
	32	13	M30 Hex Nut, Galvanized, Mat: 8	520
	33	13	Spring Lock Washer B30,5, Galvanized, Mat: Spring Steel, DIN 128	520
Install centre cover plate (212)	21	13	Hex Screw M20 X 80, Galvanized, Mat: 8.8	520
	22	13	Locking Washer VSK 20, Galvanized, Mat: Spring Steel	520
	11	1	Sealing D 1520 / 1300 X 3, Mat: Klinger -Sil	40
Install centre cone (212)	31	7	Hex Screw M20 X 65, Galvanized, Mat: 8.8 EN ISO 4017	280
	32	7	Locking Washer VSK 20, Galvanized, Mat: Spring Steel	280
Install turn buckles (212)	31	7	Hex Screw M20 X 65, Galvanized, Mat: 8.8 EN ISO 4017	280
	32	7	Locking Washer VSK 20, Galvanized, Mat: Spring Steel	280

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SCOPE	Item no	QTY per Mill	DESCRIPTION OF SPARES REQUIRED	Total QTY (30 Mills)
SEAL AIR COVERING SPARES				
Weld in new roll plate (193)		4	6mm Rolled Pate 265JR, 378.2 x 2744 x 6 mm (H x D x t) quarter segment	160
	11	12	Hex Head Screw M16 X 50, Galvanized, Mat: 1.7709 (21CrMoV5-7) EN ISO 4017	480
	12	12	Locking Edge Washer VSK 16, Galvanized, Mat: Spring Steel EN 10204 2.2	480
NOZZLE RING SPARES				
Install new nozzle ring (176)	101	26	Hex Socket Head Cap Screw M24 X 55, Galvanized, Mat: 1.7709 (21CrMoV5-7)	1040
	102	26	Spring Lock Washer Cylindrical Heads 24, Galvanized, Mat: Spring Steel	1040
Install dam ring (176)	103	24	Hex Socket Head Cap Screw M20 X 50, Galvanized, Mat: 1.7709 (21CrMoV5-7)	960
	104	24	Locking Edge Washer VSKZ 20, Galvanized, Mat: Spring Steel	960
Shim displacer ring 4+2mm (174)	21	12	Hex Socket Head Cap Screw M20 X 70, Galvanized, Mat: 1.7709 (21CrMoV5-7)	480
	22	12	Nord Lock Washer DNL 20, Galvanized, Mat: Spring Steel. EN 10204 2.2	480
Install displacer liners + 16mm graphite seal (174)		1	Displacer Shims 1 set (1, 2, 3, 4, 5mm)	40
	41	12	Plate 12 Dimension 341.9 x 1135.7, Mat: CR 4000 (Rolled Displacer Covering Cone)	120
	51	36	Hex Head Screw M20 X 50, Galvanized, Mat: 1.7709 (21CrMoV5-7)	1440
	52	36	Washer 20, Galvanized, Mat: 1.0401 (C15)	1440
	53	36	Hex Nut M20, Galvanized, Mat: 1.7258 (24CrMo5)	1440
	55	36	Wear Protection Cap D 66 X 28,5, Mat: 1.0577 (S355J2)	1440
	61	1	Sealing Cord Square 25 x 25x 14000 Ceramic Fibre with Inconel Core 500°C	40
		12	Epoxy,	240
	1	Genkem Glue for Gland Packing _ 1 Litre Tin	40	

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SCOPE	Item no	QTY per Mill	DESCRIPTION OF SPARES REQUIRED	Total QTY (30 Mills)
		1	Split Displacer Ring Assembly, 1xoff complete ring (2xoff halve-splits), ENF/MED/21/05/002	10
INSTALL OF GRINDING ROLLERS.				
Replace pan and rollers		6	Guide Rollers, Round 176 x 160 mm (L x D), Mat: EN 1.0060 (ST60-2K)	120
		6	Pendulum Joint Lower part pan, 226 x 207 x 97 mm, Mat: EN 1.0553	90
		6	Pendulum Joint Side part pan, 197 x 93 x 29 mm, Mat: EN 1.0553	120
Replace centre bracket connector (Pendulum Joint/ Butt straps) (292/293)	41	18	Spring Type Straight Pin 35 x 95, Galvanized, Mat: 1.0970 EN ISO 8752 (Bottom)	720
	42	18	Washer With Tap 21, Galvanized, Mat: 1.0401 (C15) DIN 93	720
	43	18	Hex Head Screw M20 X 140, Galvanized, Mat: 8.8 EN ISO 4017	720
	51	12	Spring Type Straight Pin 40 x 70, Galvanized, Mat: 1.0970 EN ISO 8752 (Top)	480
	52	12	Washer With Tap 25, Galvanized, Mat: 1.0401 DIN 93	480
	53	12	Hex Head Screw M24 X 120, Galvanized, Mat: 8.8 EN ISO 4017	480
	121	24	Hex Head Screw Reduced Shank M42 X 330, Galvanized, Mat: 8.8 EN ISO 4014	960
	16	6	<i>Plate 12, Dimension 65 x 283, Mat: 1.0038, Retaining Bracket 283 x 65 x 12 EN 10029</i>	120
	31	6	<i>Plate 10, Dimension 55 x 202, Mat: 1.0038, Retaining Plate Bracket Yoke 202 x 55 x 10 EN 10029</i>	120
	21	6	<i>Plate, Lower Canterng Bracket, 50 mm, Mat: EN 1.0038, 260 x 223 x 103</i>	90
	11	6	<i>Plate, Upper Canterng Bracket, 50mm thick, Mat: EN 1.0038, 294 x 179 x 50 mm</i>	90
		18	Grinding roller plugging bolts M24 X 40 with spring washer	720
		30	Butt Strap Pin 35 x 95, Galvanized, Mat: 1.0970 EN ISO 8752 (Sherlock Pins)	1200
		3	Butt Strap (Top)	90
		3	Butt Strap (Bottom)	90

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SCOPE	Item no	QTY per Mill	DESCRIPTION OF SPARES REQUIRED	Total QTY (30 Mills)
Replace vertical seal air pipe (3) (244)	51	24	Hex Head Screw M16 X 55, Galvanized, Mat: 8.8	960
	54	24	Hex Nut M16, Galvanized, Mat: 8	960
	41	12	Hex Head Screw M12 X 30, Galvanized, Mat: 8.8 EN ISO 4014	480
	42	12	Locking Edge Washer VSK 12, Galvanized, Mat: Spring Steel EN 10204 2.2	480
Replace shocks (6) (Pendulum alignment) (292/293)	91	24	Hex Head Screw M42 x 110, Galvanized, Mat: 8.8	960
	92	24	Safety Plate 43, Galvanized, Mat: 1.0401, DIN 93, EN 10204 2.2	960
	101	3	Plate 160, Dimension 401.5 x 415, Mat: 1.0553, Upper Part 1: 415 x 401,5 x 153,21	45
	111	3	Plate 160, Dimension 415 x 416,6, Mat: 1.0553, Upper Part 2: 416,6 x 415 x 153,21	45
	112	3	Plate 35, Dimension 73 x 160,3, Mat: 1.0553, Upper Part 2: 160,3 x 73 x 29	45
	121	24	Hex Head Screw Reduced Shank M42 X 330, Galvanized, Mat: 8.8 EN ISO 4014	960
	122	6	Hexagon Slotted and Castle nut M45, Galvanized, Mat: 5, DIN 935, EN 10204 2.2	240
	123	6	Split pin 8 x 80, Mat: 1.0401 (C15), EN ISO 1234	240
INSPECTION OF TIE ROD ENDS				
Replace ball carrier (331)	31	3	Ball Carrier 75 x 75 x70 Round 75 H8, Mat: OVAKO 825	60
	41	3	Ball D 75 Hardened, Mat: Roller Bearing Steel	120
	331	3	Tension rod 34CrNiMo6M B114116-35-33-IG04-00002-AF	75
	331	3	Articulated head guide bracket B114116-35-33-IG04-00027-AA	60
Replace guides and rollers		12	Guide Disc, Round disc, 75 x 25 mm (D x t),	480
		6	Guide Rollers, 102 x 55 mm (L x D)	240
		1	6 m long Equal leg Angle iron, 120 x 120 x 10 mm, Mat: Carbon Steel S355JR	40
		1	1 m long Flat bar 100 x 10 mm, Mat: Carbon Steel S355JR	40

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SCOPE	Item no	QTY per Mill	DESCRIPTION OF SPARES REQUIRED	Total QTY (30 Mills)
		18	Chamfered M24 Flat Washer, Mat: DIN 9021	720
		18	M24 Hex Nut, ISO 1500/DIN 934 Grade 8.8	720
		1	M24 threaded bar 2000 mm, DIN 939 Grade 8.8	40
		12	M12 x 40 Studs, DIN 939 Grade 8.8	480
		12	M2 Hex Nuts ISO 1500/DIN 934 Grade 8.8	480
		12	Chamfered M12 Flat Washer, Mat: DIN 9021	480
GUIDE AND THRUST PLATES SPARES				
Loosen thrust plate liners in pairs and rotate upside down (275)	12	12	Washer B 25, Galvanized, Mat: cu EN ISO 7089	480
	13	6	Hex Nut M24, Galvanized Mat: 8 EN ISO 4032	240
Install shims 5+1mm	273/1	3	Thrust Plate against Loading Frame, 358 x 385 x 52 mm (L x W x t), Mat: XCr18 _ 0.84/61039	60
	272/1	3	Thrust Plate against Mill Housing, 842 x 320 x 38 mm (L x W x t), Mat: Abrasion Resistant White Cast Iron, 22 to 27 % High Chromium Alloy	60
	273/2	3	Mill Frame Thrust Plate Terminal Strip 358 X 50 X 30 Material S355 AR+JR	120
		12	M24 x 100 SKT CSK Screw, Grade 10.9	480
		12	M24 Flat Washer, B25, Copper 44 x 25 x 5 mm	480
		12	M24 Hex Nut, Grade 8	480
	275/1	3	Mill Housing Guide Plate 842 X 50 X 30 Material S355 AR+JR	60
	276/1	3	Mill Frame Guide Plate 305 X 358 X 50 Material EN-GJS-400-15	60
	276/2	3	Mill Frame Guide Plate Terminal Strip 305 X 358 X 50 Material S355 AR+JR	120
SEAL LABYRINGTH AND RETRO SEAL SPARES				
		1	34 m long Rope Gasket 20 mm Ceramic Fibre with glass core	40

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SCOPE	Item no	QTY per Mill	DESCRIPTION OF SPARES REQUIRED	Total QTY (30 Mills)
Install labyrinth flange (112)		1	1L Genkem General Purpose, Contact Adhesive	40
	32	40	Nord Lock Washer DNL 20 Galvanized, Mat: Spring Steel	1600
	31	40	Hex Head Screw, M20 X 60, Galvanized, Mat: 1.7709 (21CrMoV5-7)	1600
	22	48	Hex Nut M20, Galvanized, Mat: 8	1920
	21	48	Stud M 20 X 70, Galvanized, Mat: 1.7709 (21CrMoV5-7)	1920
	23	48	Nord Lock Washer DNL 20, Galvanized, Mat: Spring Steel	1920
Install retro seal		1	Retro Seal, 2220 x 2176 x 16 (OD x ID x t), Mat EN 1.0038	20
		2	Joint for ring for additional sealing, 120 x 23 x 12 mm (L x W x t), rolled to 2220 diameter	80
		1	8 m long Braided Square Graphite Packing, 10 x 10 mm	40
		12	M12 Allen Socket Head Screw	480
		4	M10 Allen Socket Head Screw Grade	160
MILL REJECT BOX SPARES				
Refurbish Mill Reject Box		1	Mill Reject Box Grating – (MIDDLE), Mill Reject Box Grating (RHS) - P GRID RH SECTION; DIMENSIONS: 380 x 970 MM; OPENING SIZE: 25 x 25 mm; MATERIAL: 316L STAINLESS STEEL (316L S/S); BEARER BAR SIZE: 20 x 3 MM	25
		1	Mill Reject Box Grating (RHS) - P Grid RH Section; Dimensions: 380 x 970mm; Opening Size: 25 x 25mm; Material: 316L Stainless Steel (316L S/S); Bearer Bar Size: 20 x 3mm	25
		1	Mill Reject Box Grating (LHS) - P Grid RH Section; Dimensions: 380 x 970mm; Opening Size: 25 x 25mm; Material: 316L Stainless Steel (316L S/S); Bearer Bar Size: 20 x 3mm	25
		1	Refurbishment of Top and Bottom Gate (Including repair kits for both top and bottom Gate)	0
		1	Reject Top Gate 6mm Square Graphite Packing	25
		1	Reject Box 25mm Gland Packing (off cuts)	25

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SCOPE	Item no	QTY per Mill	DESCRIPTION OF SPARES REQUIRED	Total QTY (30 Mills)
Refurbish Mill Reject Box		24	M20 x 70mm Hex s/screws Reject Top Gate	600
		48	M12 x 30mm Hex s/screws (Scraper Doors)	1200
		48	M16 x 40mm Hex s/screws + spring washers (Inspection Door)	1200
		24	M20 x 80mm Hex s/screws + spring washers (Round Inspection Door)	600
		84	M12 x 35mm Allen Cap s/screws + spring washers (Tyre Covers)	2100
		8	M8 x 30m Hex s/screws + spring washers (Coupling Covers)	200
		12	PF Pipe Ceramic Twisted Rope (12mm)	480
		1	16mm Gland Packing (Inspection Door)	40
		3	Wear Plate No.5 Side Roller	60
		12	Wear Plate No.5 Fasteners Protection Discs	480
		6	Hard facing Pylon (Hot Air) Protection Covers	240
		6	Classifier Top Support Tube (Inner Side) + Sockets	240
		6	Classifier Bottom Support Tube (Inner Side) + Sockets	240
		6	PF Pipe Rectangular Centralizing Plates	240
		6	Inner Seal Air Elbow Pipe Support Tubes	240
		3	Seal Air Tubes and Guide Bushes	30
	68	Maintenance Door M24 x 40mm with Spring Washer	2720	
OTHER SPARES				
Other Spares		1	ENF HP Vane Wheel – Version 5 S Vane, CMP/KUS/20/09/001, Patent no: 2016/03621	20
		1	Main Mill Motor Flexible Claw Coupling: BOKU-N H1600 (FLEXIBLE PIN TYPE)	30
		1	Grinding Track Segment Driving Pin	30
		6	Pendulum Set Assembly 6 sets (3 left & 3 right): WD 140 x LG 872mm	0

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SCOPE	Item no	QTY per Mill	DESCRIPTION OF SPARES REQUIRED	Total QTY (30 Mills)
		6	Refurbishment of Pendulum Set Assembly 6 sets (3 left & 3 right): WD 140 x LG 872mm	30
		3	Tie-rod boot covers	20
		3	Hydraulics Boot/Bellow Covers Bellow for hydraulic cylinder; FBG-260/200-224,5/824,5	60
		1	Static Classifier Return Cone Ceramic tile, HV1200 B114116-35-35-IG04-00054	180
		1	MPS Mill Central Cone Covering, S235JRG2 or VRN 400 or equivalent	10
		20	Protection Caps Cone	800
		2	Cone Gasket Sheet Sealing D 1520 / 1300 x 3mm, Mat: Klinger -Sil	50
CT2 MOD SPARES				
CT2 MOD SPARES		3	Loading frame wear protection set (2xside, 1xbottom),	60
	192	2	Modified CT2 scraper assembly set: CMP/MED/19/03/001 AND ENF/MED/21/10/008	40
		1	Plenum chamber floor outer barrel liner assembly: ENF/MED/21/11/012	20
		1	Mill Static Cowl B114116-35-11-IG04-00081/82	40
		1	Pulley coupling, Type: elastic coupling, Nor-Mex E112	40
		2	Fastening flange with drive station bearings, 350mm dia X 72,5mm X 4 holes	80
		2	Take-up bearings, TTUE 55	80
		3	Inner roller seal air pipe wear protection, item 301 & 302 in B114116-35-35-IG04-00001-AB	120
	112	1	Split labyrinth seal assembly: Full set with accessories according to B114116-35-11-IG04-00002	10
		1	Gearbox Desiccant breather Heavy duty with protection against dropping & splashing water; 2 stainless steel filters; Galvanized; 1.4571 material; G1" threads	20

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A.3 Preventative Maintenance Scope

A.3.1 Raw Coal Feeder Scope

Equipment	Functional location	Type	Parts (that could fail)	Failure Mode	Strategy
Raw Coal Feeder	6-1 0HFB10-50 BZ001	Gravimetric Feeder	Bellow, Flanges, Gaskets	Wear, Mechanical damage, Leaks	Visual inspection. Check for tear or physical damage. Evidence of severe deterioration to be reported and equipment to be replaced.
Raw Coal Feeder	6-1 0HFB10-50 AF001	Gravimetric Feeder	Inlet steel guide skirting	Wear	Internal inspection. Loss of thickness of less than 50% and severe damages to be reported.
Raw Coal Feeder	6-1 0HFB10-50 AF001	Gravimetric Feeder	Drive pulley, Drive shaft, pulley coupling	Wear, Mechanical damage	Internal inspection. Physical damage inspection, wear, intrusion of foreign material between moving parts to be confirmed.
Raw Coal Feeder	6-1 0HFB10-50 AF001	Gravimetric Feeder	Drive pulley labyrinth seal	alignment	Internal inspection. Verify alignments and record results.
Raw Coal Feeder	6-1 0HFB10-50 AF001	Gravimetric Feeder	Take up pulley, Tail shaft, Pulley coupling, Take up rod	Wear, Mechanical damage	Internal inspection. Inspecting tensioning components, threaded rods, bearings and lock nuts. Any equipment damage to be rectified.
Raw Coal Feeder	6-1 0HFB10-50 AF001	Gravimetric Feeder	Tension station bearings	Seizure	Internal inspection. Verify dust or foreign material ingress.
Raw Coal Feeder	6-1 0HFB10-50 AF001	Gravimetric Feeder	Roller table idlers & pan	Seizure, Mechanical damage, Wear	Internal inspection. Verify free movement of all rollers.
Raw Coal Feeder	6-1 0HFB10-50 AF001	Gravimetric Feeder	Coal detector flap	Wear, stuck	Test free movement, measure wear on the flap, where the length is lost, it must be replaced. Check the radial hinge for possible foreign material stuck.

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Equipment	Functional location	Type	Parts (that could fail)	Failure Mode	Strategy
Raw Coal Feeder	6-1 0HFB10-50 AF001	Gravimetric Feeder	Glass, Wiper	Cracked, Deformation, Wear	Internal inspection
Raw Coal Feeder	6-1 0HFB10-50 AF001	Gravimetric Feeder	Conveyor belt	Aging	Re-torque conveyor belt to the specification. Inspect for tear, scratch marks, thickness, integrity of skirting, integrity of splicing section where applicable and inspect for any physical damage. Correct tensioning and on-track alignment to be verified. Evidence of severe deterioration to be reported and equipment to be replaced.
Raw Coal Feeder	6-1 0HFB10-50 AT001	Gravimetric Feeder	Scraper chain, Sprockets, Shafts, Take up rod	Wear, Mechanical damage	Internal inspection. Inspect wear on the sprocket teeth. Any noticeable wear should qualify for replacement of the sprocket. Measure wear and stretch on the chain links. Any noticeable deuteriation shall qualify for replacement. Take up rod to be inspect and tensioned to 50mm. Any deviation to be reported.
Raw Coal Feeder	6-1 0HFB10-50 AA102	Gravimetric Feeder	Spindle nut	Wear, Mechanical damage	Check spindle nut
Raw Coal Feeder	6-1 0HFB10-50 AA102	Gravimetric Feeder	Gland packing	Wear	Packing adjustment or replacement
Raw Coal Feeder	6-1 0HFB10-50 AA102	Gravimetric Feeder	Gate internals	Blockage, Coal build-up, Ash build-up	Cleaning
Raw Coal Feeder	6-1 0HFB10-50 AA501	Gravimetric Feeder	Spindle nut	Wear, Mechanical damage	Check spindle nut
Raw Coal Feeder	6-1 0HFB10-50 BR001	Gravimetric Feeder	Wall/Lining	Corrosion, Erosion, Wear	Internal inspection
Raw Coal Feeder	6-1 0HFB10-50 AF001	Gravimetric Feeder	Drive station bearings	Seizure	Internal inspection
Raw Coal Feeder	6-1 0HFB10-50 AF001	Gravimetric Feeder	Bed depth limiter bar	Wear, Mechanical damage (300mm gap)	Adjust it to the required level (300mm gap) or replace when the wear or damage is evident.

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Equipment	Functional location	Type	Parts (that could fail)	Failure Mode	Strategy
Raw Coal Feeder	6-1 0HFB10-50 AF001	Gravimetric Feeder	Inspection doors seals	Aging, Wear, Mechanical damage	Inspect doors and replace gasket and bolts where required.
Raw Coal Feeder	6-1 0HFB10-50 AA501	Gravimetric Feeder	Gland packing	Wear	Packing adjustment or replacement
Raw Coal Feeder	6-1 0HFB10-50 BR001	Gravimetric Feeder	Wall/Lining	Corrosion, Erosion, Wear	Internal inspection
Raw Coal Feeder	6-1 0HFB10-50 AF001	Gravimetric Feeder	Drive station bearings	Seizure	Internal inspection
Raw Coal Feeder	6-1 0HFB10-50 AF001	Gravimetric Feeder	Inspection doors seals	Aging, Wear, Mechanical damage	Seal replacement

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A.3.2 Vertical Spindle Mill Scope

Equipment	Sub-Equipment / Component Group	Functional location	Type	Parts (that could fail)	Failure Mode	Strategy	Frequency
Vertical Spindle Mill	Fire Fighting System	6-1 0HFC10-50 AA151	NO INFO	Ball valve, hose	Leaks, Mechanical damage	Functional testing	10 000 Hrs
Vertical Spindle Mill	Fire Fighting System	6-1 0HFC10-50 BR010	NO INFO	Nozzle, shield	Blockage, Wear, Mechanical damage	Internal inspection	10 000 Hrs
Vertical Spindle Mill	Motor/Gearbox Coupling	6-1 0HFC10-50 AJ001 MK01	Flexible claw coupling	Flexible buffer, Claw rings	Wear, Cracked, Misalignment	Internal inspection	10 000 Hrs
Vertical Spindle Mill	Motor/Gearbox Coupling	6-1 0HFC10-50 AJ001 MK01	Flexible claw coupling	Coupling bearing	Seizure, Mechanical damage, Wear	Internal inspection	10 000 Hrs
Vertical Spindle Mill	Mill Housing	6-1 0HFC10-50 AJ001	MPS Mill, Hitachi, Type MPS265	Access/maintenance door and seals	Wear, Mechanical damage	Replace seals	10 000 Hrs
Vertical Spindle Mill	Mill Housing	6-1 0HFC10-50 AJ001	MPS Mill, Hitachi, Type MPS265	Central cone, Bolts	Erosion, Wear, Mechanical damage	Internal inspection	10 000 Hrs
Vertical Spindle Mill	Rotating Nozzle Ring	6-1 0HFC10-50 AJ001	MPS Mill, Hitachi, Type MPS265	Nozzle ring segments, Dam ring segments	Wear, Erosion, Mechanical damage	Replace	10 000 Hrs

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Equipment	Sub-Equipment / Component Group	Functional location	Type	Parts (that could fail)	Failure Mode	Strategy	Frequency
Vertical Spindle Mill	Rotating Nozzle Ring	6-1 0HFC10-50 AJ001	MPS Mill, Hitachi, Type MPS265	Nozzle ring segments, Displacer	Wear, Tightness	Clearance checks	10 000 Hrs
Vertical Spindle Mill	Hot Ring Gas Duct	6-1 0HFC10-50 AJ001	MPS Mill, Hitachi, Type MPS265	PA duct inlet, support beams	Erosion, Wear, Mechanical damage	Internal inspection	10 000 Hrs
Vertical Spindle Mill	Loading Frame	6-1 0HFC10-50 AJ001	MPS Mill, Hitachi, Type MPS265	Housing thrust plates	Wear, Tightness	Replacement	10 000 Hrs
Vertical Spindle Mill	Tension Rods	6-1 0HFC10-50 AJ001	MPS Mill, Hitachi, Type MPS265	Tie rod seal	Wear, Mechanical damage	Clearance checks	10 000 Hrs
Vertical Spindle Mill	Grinding track carrier	6-1 0HFC10-50 AJ001	MPS Mill, Hitachi, Type MPS265	Grinding track carrier, Protection covering, Covering	Wear, Mechanical damage	Internal inspection	10 000 Hrs
Vertical Spindle Mill	Grinding track carrier	6-1 0HFC10-50 AJ001	MPS Mill, Hitachi, Type MPS265	Grinding track segments, Clamping screws	Wear	Replacement	10 000 Hrs
Vertical Spindle Mill	Grinding roller assembly	6-1 0HFC10-50 AJ001	MPS Mill, Hitachi, Type MPS265	Roller Assembly	Wear	Replacement	10 000 Hrs
Vertical Spindle Mill	Grinding roller assembly	6-1 0HFC10-50 AJ001	MPS Mill, Hitachi, Type MPS265	Sealing airline, guide bush	Wear, Mechanical damage	Clearance checks	10 000 Hrs

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Equipment	Sub-Equipment / Component Group	Functional location	Type	Parts (that could fail)	Failure Mode	Strategy	Frequency
Vertical Spindle Mill	Classifier	6-1 0HFC10-50 AJ001	Static Classifier, Hitachi, Type SLK470	Lower classifier cone, Return cone, Vanes, Support stays, Swinging dampers, Coal dust outlet	Wear, Erosion	Internal inspection	10 000 Hrs
Vertical Spindle Mill	Classifier	6-1 0HFC10-50 AJ001	Static Classifier, Hitachi, Type SLK470	Vane drive	Wear, Mechanical damage	Visual inspection	10 000 Hrs
Vertical Spindle Mill	Seal Air Fans	6-1 0HFC16/26/36/46/56 AN001	Centrifugal fan, WITT & SOHN, Type HRZ10/224/975/5, 17.5kPa, 4270m3/h	Fan impeller	Wear, Imbalance, Cracks	Internal inspection	3Y
Vertical Spindle Mill	Seal Air Fans	6-1 0HFC16/26/36/46/56 AN001-MK01	Coupling, Flender, Flexible N-Eupex, Type B 140	Flexible elements	Wear, Cracked, Misalignment	Visual inspection	3Y
Vertical Spindle Mill	Mill Hydraulic System	"6-1 0HFC12/22/32/42/52 AE011	Hydraulic cylinder, ZS Zylinder Type 6621.00, 360 mm piston diam, 600 mm stroke	Bellows	Leakage, Damage	Visual Inspection for damage and leaks, replace the cylinder where necessary	10 000 Hrs
Vertical Spindle Mill	Gearbox	6-1 0HFC12/22/32/42/52 AE021	Planetary bevel wheel gear unit, HPE, Type KPV 1750 S	Bolts & Screw connections	Looseness, Damage	Measure clearance of the tilting pad bearing, Visual checks of the white metal layer	10 000 Hrs

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Equipment	Sub-Equipment / Component Group	Functional location	Type	Parts (that could fail)	Failure Mode	Strategy	Frequency
						Measure gap between labyrinth seal and shaft Alignment of the motor to the gearbox	
Vertical Spindle Mill	Reject box	6-1 0HFC12/22/32/42/52 AE031"	Gate Valve with hydraulic cylinder, Schütte Industrieservice, Type GAS DN 350 PN 06	Slide gate, Valve stem, Brass bush, Inlet seal, Guide cams	Wear, Mechanical Damage	Visual checks of the white metal layer	10 000 Hrs
Vertical Spindle Mill	Reject box	6-1 0HFC14/24/34/44/54 AA201	Gate Valve with hydraulic cylinder, Schütte Industrieservice, Type GAS DN 250 PN 16	Slide gate, Valve stem, Brass bush, Inlet seal, Guide cams	Wear, Mechanical Damage	Alignment of the motor to the gearbox"	10 000 Hrs
Vertical Spindle Mill	Reject box	6-1 0HFC14/24/34/44/54 AA202	Circular sight glass fitting, Type DIN 28120, RSt 37-2 flanges	Gasket	Aging, Wear, Mechanical damage	Internal inspection	10 000 Hrs
Vertical Spindle Mill	Reject box	6-1 0HFC14/24/34/44/54 AA202	Steel welded construction, Coarse particles – manual disposal, Fine particles – hydraulic disposal	Maintenance door seal	Mechanical damage, Wear, Aging	Refurbish	10 000 Hrs

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Equipment	Sub-Equipment / Component Group	Functional location	Type	Parts (that could fail)	Failure Mode	Strategy	Frequency
Vertical Spindle Mill	Reject box	6-1 0HFC14/24/34/44/54 AX001	Steel welded construction, Coarse particles – manual disposal, Fine particles – hydraulic disposal	Grating	Holed, mechanical damage	Internal inspection	10 000 Hrs

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